Instructions for Use

English

CombiDiagnost R90

Version 1.1

4512 987 48331 AA /709 * MAR 2020 - en-US

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- CombiDiagnost R90 V.1.1
- Eleva Workspot for CombiDiagnost R90 V.1.1

Philips Healthcare

CombiDiagnost R90

Instructions for Use

Version 1.1

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www.philips.com/healthcare

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1 Worth Knowing

Publication Details

Published by Philips Medical Systems DMC GmbH

Compliance

This Medical Device meets the provisions of the European Medical Device Regulations.

The wireless portable detector meets the provisions of the Radio Equipment Directive 2014/53/EU.

This Medical Device complies with international standards such as:

- IEC 62304 Medical device software – Software life cycle processes
- IEC 62366 Application of usability engineering to medical devices
- ISO 14971 Application of risk management to medical devices
- IEC 60601-1 Medical Electrical Equipment – Part 1: General Requirements For Basic Safety And Essential Performance
- IEC 60601-1-2 Medical Electrical Equipment - Part 1–2: General Requirements For Basic Safety And Essential Performance – Collateral Standard: Electromagnetic Compatibility - Requirements And Tests
- IEC 60601-1-3 Medical Electrical Equipment – Part 1–3: General Requirements For Basic Safety And Essential Performance – Collateral Standard: Radiation Protection In Diagnostic X-Ray Equipment
- IEC 60601-1-6 Medical Electrical Equipment – Part 1–6: General Requirements For Basic Safety And Essential Performance – Collateral Standard: Usability
- IEC 60601-2-54 Medical Electrical Equipment – Part 2–54: Particular Requirements For The Basic Safety And Essential Performance Of X-Ray Equipment For Radiography And Radioscopy
- NEMA PS 3.1 - 3.20 Digital Imaging And Communications In Medicine (DICOM) Set
- ISO 10993-1 Biological Evaluation Of Medical Devices – Part 1: Evaluation And Testing Within A Risk Management Process

If you have further questions regarding the applicable national or international standards, please address them to:

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About These Instructions for Use

These Instructions for Use are intended to assist users in the safe and effective operation of the product described. Before attempting to operate the product, you must read these Instructions for Use, noting and strictly observing all WARNING and CAUTION notices. Pay special attention to all the information given and procedures described in the “Safety” section.

These Instructions for Use are part of the system. They shall be kept in the immediate vicinity of the system so that they are accessible at any time.

WARNING

A WARNING alerts you to a potential serious outcome, adverse event or safety hazard. Failure to observe a warning may result in death or serious injury to the user or patient.

CAUTION

A CAUTION alerts you to where special care is necessary for the safe and effective use of the product. Failure to observe a caution may result in minor or moderate personal injury or damage to the product or other property, and possibly in a remote risk of more serious injury, and/or cause environmental pollution.

NOTICE

A **NOTICE** is used to identify special advice, for example to assist the operator or to improve an operating sequence.

▷ Condition for operation

► Single step in an action

⇨ Result produced by a step

These Instructions for Use describe the most extensive configuration of the product, with the maximum number of options and accessories. Not every function described may be available on your product.

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Depending on the configuration, other Instructions for Use may be delivered with the system, and these should be consulted for safety instructions, calibration, test procedures and maintenance.

For installation, see the system's service documentation.

These Instructions for Use were originally drafted, approved and supplied by Philips in the English language.

Intended Use

The CombiDiagnost R90 is a multi-functional general R/F system. It is suitable for all routine radiography and fluoroscopy exams, including specialist areas like angiography or pediatric work, excluding mammography.

Intended Operator Profile

CombiDiagnost R90 offers fluoroscopy and radiography functionality in a combined system, which means it will be operated by radiologists (physicians) and radiographers (technologists).

Radiologists with high medical background and less technical and administrative background usually perform fluoroscopy work and take spot images as there is more clinical interaction required during fluoroscopy examinations, for example, injections, and they can influence the procedure to achieve a better diagnosis. In some cases, specially trained radiographers perform the fluoroscopy examinations.

Radiographers mostly schedule, prepare, and finalize fluoroscopy examinations and perform Bucky examinations. Radiographers have a more technical background than radiologists and are responsible for the administrative work.

Minimum education requirements:

- Knowledge in general radiographic positioning and procedures
- Knowledge in anatomy
- Knowledge in exposure techniques
- Knowledge in radiation protection
- Knowledge in hygiene and basic infection control
- The user must be trained for operation of the system.

The detailed qualifications to operate an X-ray system are defined by local regulations.

Indications for Use

The CombiDiagnost R90 is a multi-functional general R/F system. It is suitable for all routine radiography and fluoroscopy exams, including specialist areas like angiography or pediatric work, excluding mammography.

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The medical purpose of CombiDiagnost R90 is diagnostic radiology which contains standard fluoroscopy and standard (DR) radiography procedures.

Diagnostic fluoroscopy procedures are, for example:

- Barium studies of the upper and lower gastro intestinal tract
- Urinary studies
- Myelography
- Arthrography
- Endoscopic retrograde cholangiopancreatography (ERCP)
- Hysterosalpingography
- Phlebography
- Venograms
- Arteriograms
- Placement of feeding tubes
- Fluoroscopy guided injections

Standard radiography procedures are, for example:

- X-ray examinations of the skeleton
- X-ray examinations of the lung
- X-ray examinations of soft tissue such as abdomen
- Overview of the whole spine
- Overview of the complete leg

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Contraindications

No absolute contraindications are given for standard radiology. Due to the nature of X-ray procedures, the patient is exposed to radiation. Adverse health effects exist and are well known. Therefore, the responsible radiologist must assess risks and benefits. The radiologist must identify relative contraindications, depending, for example, on available alternative diagnosis technologies.

While radiologists always try to use low dose rates during fluoroscopic procedures, the length of a typical procedure often results in a relatively high absorbed dose for the patient. The potential risks from the application of ionizing radiation must be carefully balanced with the benefits of the procedure to the patient for fluoroscopy procedures. Furthermore, contraindications related to contrast agents and contraindications for special fluoroscopy procedures must be considered for the risk benefit analysis.

Target Population

Patients can be:

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- Very young or very old (from newborn to >100 years)
- Heavily injured (fractures, brain lesion, bleeding)
- Unconscious
- Deranged
- Handicapped or disabled
- Under influence of drugs
- Immobile

Their physical appearance might be:

- Taller than 2 m (78.7 in)
- Very small, for example, babies
- Heavy and large, up to 350 kg (772 lb) or even more

As it is not possible to build patient positioning devices with unlimited patient weight capacity, heavy patients can only be positioned on the patient support within the specified patient load capacity of the final system.
Transportation of immobile or handicapped patients can be:

- Wheelchair
- Stretcher
- Bed

Clinical Benefits

Philips fluoroscopy includes the following advantages:

- Extensive digital functionality and comprehensive room solution configurations enable to easily carry out high-quality digital radiography as well as fluoroscopy applications in just one room.
- Full clinical coverage for all classic fluoroscopy applications.
- Intuitive workflow, customizable pre-sets, and motorized geometry movements.
- Comprehensive X-ray dose management with dose wise features.

Compatibility

NOTICE

You may only combine the equipment with additional equipment, components, assemblies distributed and tested by Philips. This also applies to replacement parts.

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CAUTION

Risk of image artifacts because grid with wrong SID has been used

Do not use the product in combination with other products or components unless such other products or components are expressly recognized as compatible by Philips.

Changes and/or additions to the product should only be carried out by Philips or by third parties expressly authorized by Philips to do so. Such changes and/or additions must comply with all applicable laws and regulations that have the force of law within the jurisdiction(s) concerned, and with best engineering practice.

WARNING

Changes and/or additions to the product that are carried out by persons without the appropriate training, and/or using unapproved spare parts, may lead to the Philips warranty being voided. As with all complex technical products, maintenance by persons not appropriately qualified and/or using unapproved spare parts carries serious risks of damage to the product and of personal injury.

Prescription Device Statement

CAUTION

Federal law restricts this medical equipment to sale by or on the order of a physician. (United States only)

Training

CAUTION

Users of this product must have received adequate training on its safe and effective use before attempting to operate the product described in these Instructions for Use. Training requirements for this type of device will vary from country to country. Users must make sure they receive adequate training in accordance with local laws or regulations. If you require further information about training in the use of this product, please contact your local Philips representative or

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WARNING

Risk of misdiagnosis

The incorrect use of image processing functions can give rise to false information in the image. Image information of relevance to diagnosis may be suppressed or misrepresented. You must have expert knowledge of digital image processing to change processing protocol settings.

Conformity

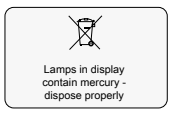
Dangerous Substances

This product may contain substances of very high concern (SVHCs).

According to EU requirements (REACH) Philips provides detailed information at www.philips.com/about/sustainability/reach

This information will be regularly updated.

Mercury (USA Only)



This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or federal laws. (Within this system, the backlight lamps in the monitor display contain mercury.)

Perchlorate

The product meets the provisions and statutes effective in California. It contains perchlorate.

For further information please visit
www.dtsc.ca.gov/hazardouswaste/perchlorate

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2 Safety and Requirements

Warnings and Cautions

WARNING

Maintenance and faults
Do not use the product for any application until you are sure that the user routine-checks have been satisfactorily completed, and that the periodic maintenance of the product is up to date. If any part of the product is known (or suspected) to be defective or wrongly adjusted, do not use the product until a repair has been made. Operation of the product with defective or wrongly adjusted components could expose the user or the patient to radiation or other safety hazards. This could lead to fatal or other serious personal injury, clinical misdiagnosis or clinical mistreatment.

Safety awareness
Do not use the product for any application until you have read, understood and know all the safety information, safety procedures and emergency procedures contained in this Safety section. Operation of the product without a proper awareness of how to use it safely could lead to fatal or other serious personal injury. It could also lead to clinical misdiagnosis or clinical mistreatment.
Never attempt to remove, modify, override or obstruct any part of the product. Product changes by unauthorized personnel could lead to fatal or other serious personal injury.

Adequate training
Do not use the product for any application until you have received adequate and proper training in its safe and effective operation. If you are unsure of your ability to operate this product safely and effectively do not use it. Operation of this product without proper and adequate training could lead to fatal or other serious personal injury. It could also lead to clinical misdiagnosis or clinical mistreatment.
Do not operate the product with patients unless you have an adequate understanding of its capabilities and functions. Using this product without such an understanding may compromise its effectiveness and/or reduce the safety of the patient, you and others.

Safety devices
Never attempt to remove, modify, override or obstruct any safety device on the product. Interfering with safety devices could lead to fatal or other serious personal injury.

Intended use and compatibility
Do not use the product for any purposes other than those for which it is intended. Do not use the product with any product other than that which Philips recognizes as compatible. Operation of the product for unintended purposes, or with an incompatible product, could lead to fatal or other serious injury. It could also lead to clinical misdiagnosis or clinical mis-

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treatment.
You may only use this medical equipment in compliance with the safety instructions in these Instructions for Use and not for purposes other than those for which it is intended.

The user is always responsible for conforming to the regulations that apply to the setup and operation of medical equipment.

NOTICE

No part of the system shall be serviced or maintained while in use with a patient.

WARNING

- **Philips only accepts responsibility for the safety features of its products if maintenance, repairs, and modifications are performed by Philips or persons explicitly authorized to do so by Philips.**
- **As with any technical appliance, this medical equipment also calls for proper operation and regular competent maintenance and care, which are described in the section "Maintenance, Cleaning and Disposal."**
- **In the event of incorrect operation or maintenance of medical equipment, Philips cannot be held liable for any resulting faults, damage, or injuries.**
- **Even if no error message appears, but the medical equipment does not function as usual (first signs of a defect), customer service must be informed.**
- **Safety circuits may not be removed or modified in any way.**
- **You must not use this medical equipment if it has any electrical or mechanical defects. This applies, particularly, to faults in indicators, displays, warnings, and alarms.**

WARNING

Only especially trained and authorized technicians are allowed to service the Bucky unit.

CAUTION

Do not exceed the ambient conditions.

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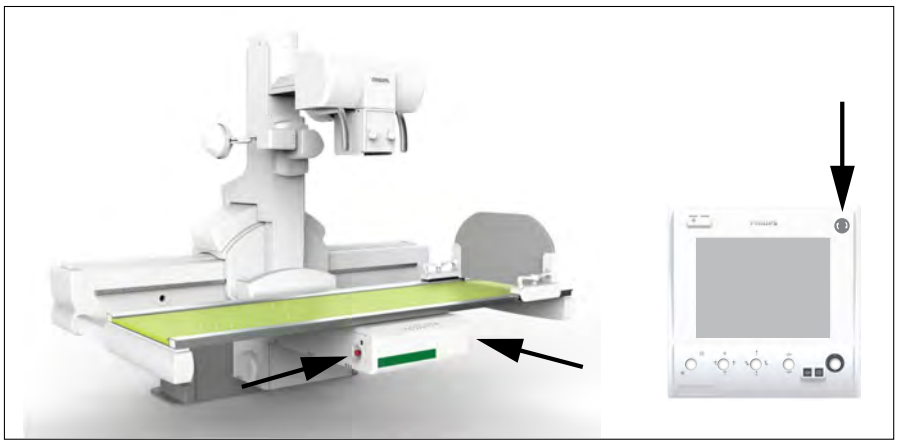
NOTICE

Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.
“Serious incident” means any incident that directly or indirectly led, might have led or might lead to any of the following:

- The death of a patient, user or other person
- The temporary or permanent serious deterioration of a patient's, user's or other person's state of health
- A serious public health threat

Emergency Procedure

Emergency Stop Button



NOTICE

When you perform a movement, you must always pay attention. In case of a danger, press one of the red emergency buttons located on the control console and on the table.

► In an emergency, press this button.

⇨ Any movements and functions are stopped.

► Move the button clockwise to switch on movements again.

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Safety Devices

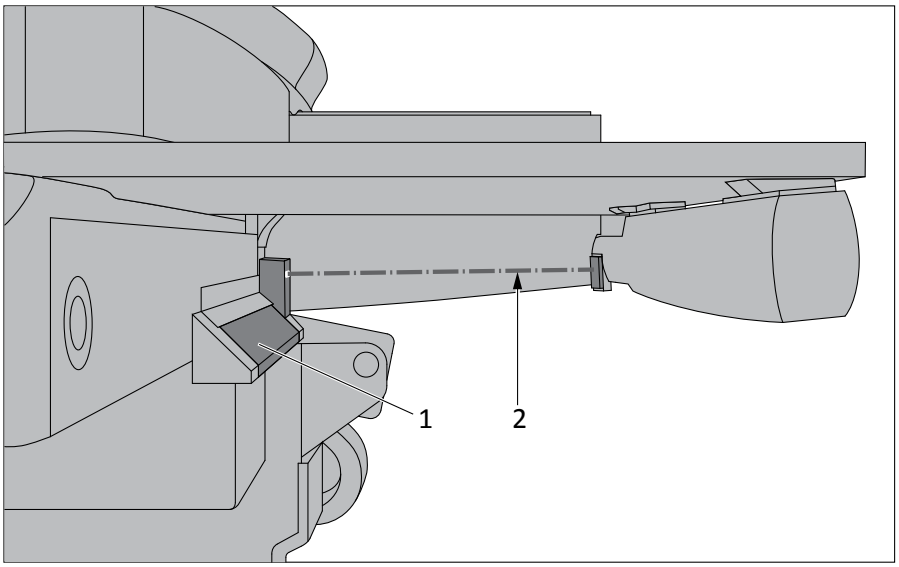

Fig. 1: Safety devices on the right-hand side of the column

The system includes safety devices to avoid getting trapped within the geometry. The safety devices are located on both sides of the column.

When the flap (1) has been pressed or the light beam (2) has been interrupted while performing any movement, a message appears.

► If the message cannot be reset, restart the system at the Eleva Workspot.

NOTICE

As long as the flap is pressed or the light beam is interrupted, you cannot perform any movement that endangers the person standing in the area behind the table.

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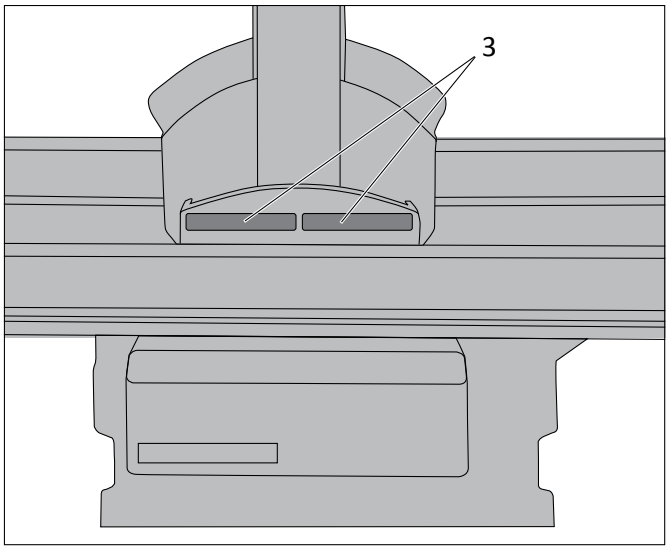

Fig. 2: Safety device behind the table at the column

- ► When you touch one of the gray stripes (3), the following movements are stopped:
  - Transversal movement of the table top
  - Longitudinal movement of the column
  - Angling the column
- ⇨ The movements can be performed again as soon as you have released the gray stripes.

Safe Zone

For the ceiling suspension, there is a safe zone defined around the table. When the ceiling suspension leaves the safe zone, the table movements are stopped. When the ceiling suspension leaves or enters the safe zone of the table, a message appears on the Eleva Workspot.

Electrical Safety

According to IEC 60601-1 this medical equipment is classified as Class I ME equipment and applied parts are classified as Type B applied parts.

Type B applied parts are not suitable for direct cardiac application.

The system is designed to run continuously at normal use.

WARNING

Do not remove covers or cables from this product unless expressly instructed to do so in these Instructions for Use.

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CAUTION

Do not operate the system adjacent to or stacked with other equipment.

If you connect parts of a system to a power strip, contact Philips service first. Connect only parts of the same system to one power strip. Safeguard unused sockets of the power strip.

This medical equipment may only be operated in medical rooms which meet IEC requirements.

Protection Against Entering of Liquids

This medical equipment meets class IPX0 according to IEC 60529 (no special protection). According to IEC 60601-1 sub-clause 7.2.9, no label and no note is required.

WARNING

The medical equipment is not protected against entering of liquids. Do not allow liquids to enter the medical equipment described.

The bar code scanner meets class IP41 according to IEC 60529 (resistant against dripping water).

Protection Against Entering of Liquids - Wireless portable detector

The large wireless portable detector meets Class IP41 according to IEC 60529 (resistant against dripping water).
The small wireless portable detector meets Class IP43 according to IEC 60529 (resistant against spraying water).

NOTICE

Fluids may get under the rim, but not inside the wireless portable detector. To protect the wireless portable detector from contamination with dirt or germs you may use protective bags.

Uninterruptable Power Supply (UPS)

The optional uninterruptable power supply (UPS) protects the Eleva Workspot from power outages.

CAUTION

After System Off, Emergency Off, Room Off, or Power down: If the UPS is installed, the Eleva Workspot will be under power even when the power is turned off.

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Applied Parts According to IEC 60601-1

Component	Applied part
Patient table	- Table top - Compressor - Detector front cover
Wireless portable detector	Front cover
Wall stand (VS)	Cover
Ceiling Suspension CSM	-
Stitching support	Tread surface
Accessories	- Hand grips - Footrest

Patient Environment

The Eleva Workspot may not be installed in the patient environment. There must be a distance of at least 1.5 m to the patient (IEC 60601-1-1).

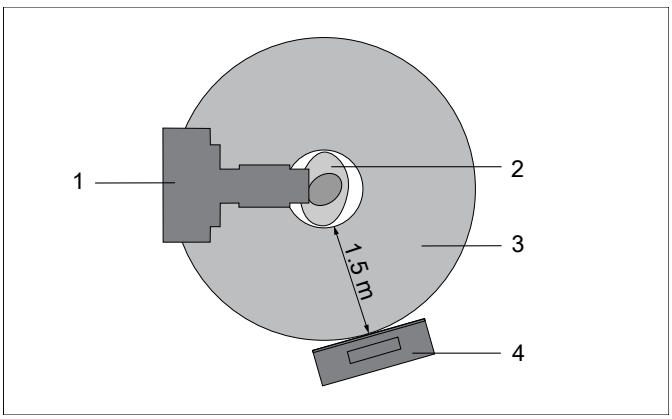

Fig. 3: Standing patient

No.	Description
1	X-ray system (wall stand with ceiling suspension)
2	Patient
3	Patient environment
4	Eleva Workspot

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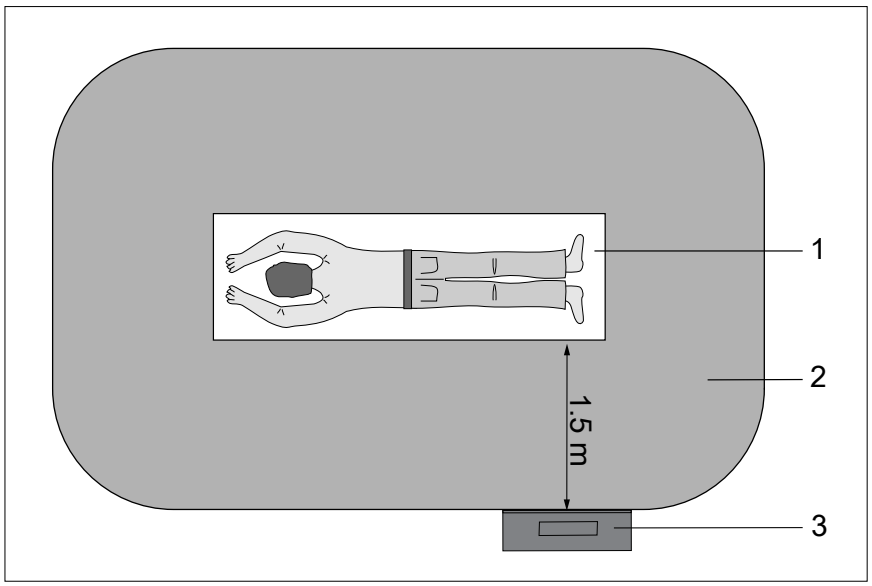

Fig. 4: Lying patient

No.	Description
1	Table top
2	Patient environment
3	Eleva Workspot

Mechanical Safety

WARNING

- **Be sure to keep all body parts or clothing free of the equipment to avoid getting caught or trapped within the moving components of this medical equipment.**
- **Remove all objects from the medical equipment's radius of movement.**
- **Make sure that ceiling-mounted components you are not using (monitor suspension, X-ray tube) are positioned in such a way that neither staff nor patients can be injured by them.**
- **You may not transport this medical equipment while it is in operation. Shut down the medical equipment before transportation and ensure that all peripheral parts of the system (monitor, mouse, keyboard, cables, etc.) are disconnected and transported safely.**

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WARNING

Make sure that audible and visual communication between the operator and patient are established throughout the entire examination. If necessary, communication must be maintained through technical means, for instance, an intercom.

WARNING

Do not remove covers or cables from this medical equipment unless expressly instructed to do so in these Instructions for Use. Moving parts are present within this product. Removing covers could lead to serious or fatal personal injury.

Covers should only be removed by qualified and authorized service personnel. In this context, qualified means those legally permitted to work on this type of medical electrical product in the jurisdiction(s) in which the product is being used, and authorized means those authorized by the user of the product.

Only non-allergenic materials are used.

Explosion Safety

WARNING

Do not use this product in the presence of explosive gases or vapors. Do not use this product in the presence of an oxygen-rich environment or an inflammable anesthetic mixture with air, oxygen or nitrous oxide. Using this product in an environment for which it was not designed can lead to fire or explosion.
This medical equipment is not AP or APG equipment (anaesthetic-proof or anaesthetic-proof category G [gas]).

WARNING

Detergents and disinfectants, including those used on patients, may create explosive mixtures of gases. Please observe the relevant regulations.

WARNING

Do not use flammable or potentially explosive disinfecting sprays. Such sprays create vapors, which can ignite, causing fatal or other serious personal injury.

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Fire Safety

WARNING

- **You must never operate this medical equipment in areas where there is a risk of fire.**
- **If it is safe to do so, isolate the product from electrical and other supplies before attempting to fight a fire. This will reduce the risk of electric shocks.**

WARNING

Ventilation apertures must not be covered while the equipment is switched on.

WARNING

On electrical or chemical fires use only extinguishers which are specifically labelled for those purposes. Using water or other liquids on an electrical fire can lead to fatal or other serious personal injury.

WARNING

This medical equipment is not AP or APG equipment (anaesthetic-proof or anaesthetic-proof category G [gas]).

Electrostatic Discharge (ESD)

CAUTION

Always use proper static procedures, protection, and products prior to opening and during handling of this product. This product contains components that are electrostatic sensitive. Failure to use ESD procedures may cause damage to these components. Such damage to components is not covered by Philips warranties.

Connections to sensitive parts are identified by the ESD warning symbol as shown.

Electrostatic discharge (ESD) can amount to a significant voltage, which may cause damage to Printed Circuit Boards (PCB) or other systems.

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ESD damage is cumulative and may not be apparent at first, as indicated by a hard failure, but can cause degraded performance. Therefore, always use proper ESD handling procedures. ESD can result from low humidity condition or use of electrical equipment on carpeting, linens, and clothing.

Electromagnetic Compatibility

WARNING

Medical electrical equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the accompanying documents.
In accordance with its purpose, this device fulfills the regulations of the EMC legislation which govern the permissible emission of electromagnetic fields from electrically operated equipment and the immunity to be fulfilled.
Despite this, it cannot be excluded with absolute certainty that radio signals from high-frequency transmitters, such as mobile phones or similar mobile radio equipment, which also satisfy the EMC regulations will not influence the proper functioning of electro medical equipment when these are operated in direct proximity with relatively high transmitting power. The operation of such radio equipment should, therefore, be avoided in close proximity to electronically regulated or controlled medical products in the face of possible functional interference.

Explanation
Electronic equipment which conforms to the EMC regulations is configured in such a way, that under normal circumstances, malfunctions caused by electromagnetic interference can be excluded. However, with regard to radio signals from high-frequency transmitters with a relatively high transmitting power, which are operated in close proximity to electronic devices, the occurrence of possible electromagnetic incompatibility with the electronic device cannot be completely ruled out.

With unusual configurations, this could result in unintentional operating sequences being initiated in the device and, under certain circumstances, undesirable risks for patient or operator.

Therefore, the activation of any transmission from mobile radio equipment – this also applies to equipment in standby mode – is to be avoided.

Mobile phones must be **switched off** in marked problem areas.

For further information see chapter “Technical Data.”

WiFi Connectivity of the Wireless Portable Detector

The detector uses standard WiFi technology for data transfer to the workstation. This technology is proven to be safe in combination with current pacemakers. However it can not be completely excluded that an older pacemaker or other EMC sensitive life-supporting device be influenced by the WiFi emission if operated in close proximity to the detector.

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WARNING

WiFi technology is used by the wireless portable detector for data transfer. Due to the WiFi emission, special care must be taken when using the wireless portable detector close to life-supporting devices. In this respect observe the following rules:

- **The life-supporting device should be certified according to IEC 60601-1-2. This standard defines the minimum distance for a given maximum emission power, corresponding to a maximum instantaneous electrical field of 10 V/m. Customers have to take into account, on their own responsibility, that older life-supporting devices do not necessarily satisfy the IEC 60601-1-2 criteria.**
- **Make sure that you keep the minimum distance to a life-supporting device. Take into consideration that a strict compliance with IEC 60601-1-2 requires the following distances at the given emission power:**

WiFi component	Emission frequency[1]	Maximum WiFi emission power	Minimum distance to life supporting devices
Wireless portable detector	2.4 GHz	17 mW	30 cm (11.8 in)
	5 GHz	13 mW	26 cm (10.2 in)

[1)]The WiFi connection of the internal network can be configured for 2.4 GHz or 5 GHz bands. It is recommended to use the 5 GHz band since this can be expected to show less EMC effects.

WARNING

Special consideration for pacemakers

WiFi technology is proven to be safe in combination with current pacemakers. However it cannot be completely excluded that an older pacemaker or other EMC sensitive life-supporting device be influenced by the WiFi emission if operated in close proximity to the wireless detector.

- **If you suspect that there will be an EMC interaction between the detector and a pacemaker or life-supporting device, switch off the WiFi connection and use the cable connection.**

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Radiation Protection

CAUTION

This product may contain radioactive material or generate ionizing radiation.

Ensure that before each X-ray exposure all the necessary radiation protection measures have been taken.

When using X-radiation the personnel in the examination room must comply with the valid radiation protection regulations. In this respect please observe the following rules:

- **Distance is the most effective radiation protection. Keep as large a distance as possible from the object exposed and the X-ray tube assembly.**
- **Avoid working in the direct beam of radiation. If this is inevitable, protect yourself. Wear radiation protection gloves.**
- **Select as short an examination time as possible. This will reduce total radiation dose considerably.**
- **Move the region of interest as close as possible to the image intensifier/film cassette/ detector. Apart from reducing exposure to radiation you will also optimize the exposure.**
- **Always be aware that any material brought into the path of radiation between the patient and the image receptor will have a negative influence on the image quality as well as on the patient dose.**
- **Safety circuits which may prevent X-radiation from being switched on under certain conditions may be neither removed nor modified.**

CAUTION

If you have to remain near the patient during the examination, keep inside the zone of occupancy when radiation is switched on.

CAUTION

To protect the patient against radiation always use radiation protection accessories in addition to devices which are fitted to the X-ray equipment.

CAUTION

Wear protective clothing. Radiation protection aprons with a lead equivalent of 0.35 mm attenuate X-radiation at 50 kV by 99.84%, and at 100 kV by 91.2%.

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CAUTION

Always use the smallest X-ray field collimation. Scattered radiation is largely dependent on the volume of the object being exposed.

NOTICE

Unwanted or excessive radiation

Always select the correct measuring field for the examination. Make sure that the measuring field always corresponds with the region of interest and is fully covered by the body. Otherwise you may cause unwanted or excessive radiation.

CAUTION

Always make sure that the X-ray field collimation completely covers the selected measuring field.

CAUTION

Always select a focal spot to skin distance as large as possible to keep the absorbed dose for the patient as low as reasonably possible.

CAUTION

To avoid unwanted or excessive radiation, always be sure that the path of radiation corresponds with the selected registration device. Example: If the table detector is selected at the Eleva Workspot, do not expose on the detector of the wall stand.

CAUTION

There should be no persons other than the patient in the examination room during X-ray exposure. If circumstances require another person to enter the room while X-ray exposures are planned or possible, that person should wear a lead apron in accordance with accepted radiation protection practices.

CAUTION

Risk of unintentional release of X-ray

Make use of the X-ray disabling mechanism (see Instructions for Use Eleva Workspot, chapter “Generator area”) to avoid any production of X-ray, for example, when placing the patient.

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NOTICE

Whenever possible, use the inverse square law as a simple measure of radiation protection: The dose is proportional to the inverse of the square of the distance between the X-ray focal spot and the irradiated object. Thus if you double the distance you reduce the dose by a factor of four.

NOTICE

Keep the fluoroscopy time as short as possible, especially when making repetitive or prolonged exposures.

Stray Radiation - Zones of Occupancy

For radiological examinations that require the user to be close to the patient, this chapter provides information on the distribution of stray radiation. Values of stray radiation in significant zones of occupancy are stated in accordance with IEC 60601-1-3 for the fluoroscopy mode and the following parameters:

- SRO 33100 ROT 380: continuous tube current of 3.18 mA, tube voltage of 110 kV
- SRM 0608 ROT-GS 505: continuous tube current of 4 mA, tube voltage of 125 kV

In the following figures, the zones of occupancy are shown in gray.

Significant Zone of Occupancy - Horizontal Table with Vertical Beam

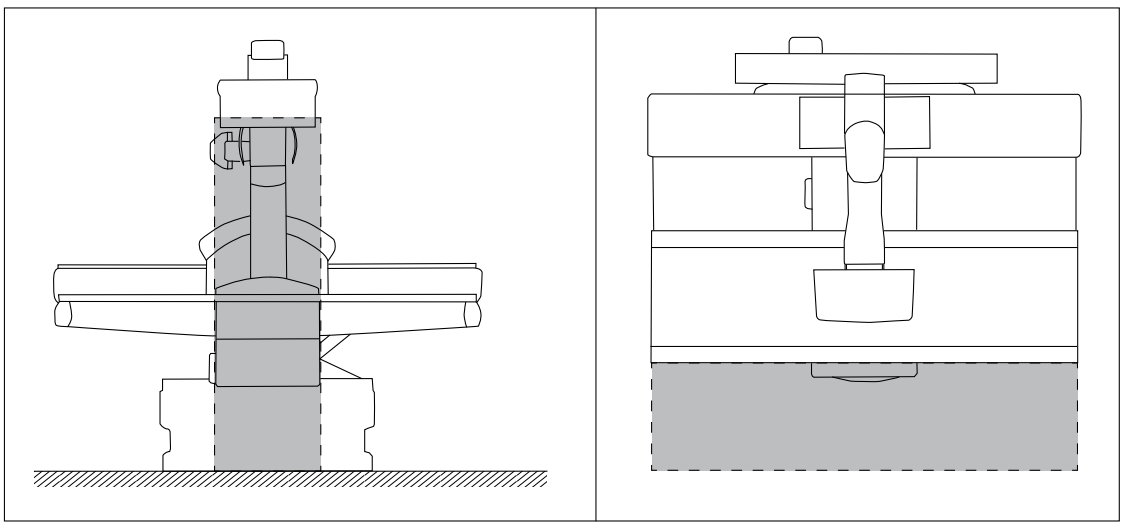

Fig. 5: Front view of horizontal table (left) and top view of horizontal table (right)

Minimum size of significant zone of occupancy:

- Floor area: 600 mm x 600 mm (23.6 in x 23.6 in)
- Height: 2,000 mm (78.7 in)

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NOTICE

The front view shows a zone of occupancy as required. Since the tube unit moves through 1,600 mm (62.9 in), the top view shows the total zone of occupancy.

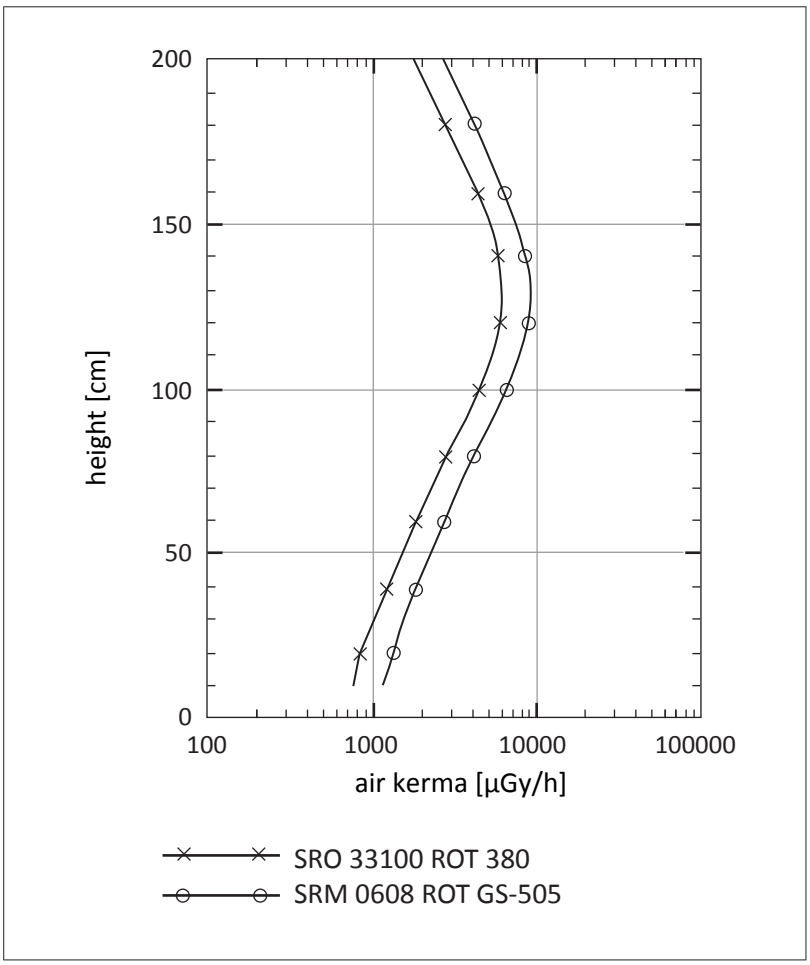

Fig. 6: Distribution of stray radiation within the significant zone of occupancy when the X-ray beam is vertical

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Significant Zone of Occupancy - Vertical Table with Horizontal Beam

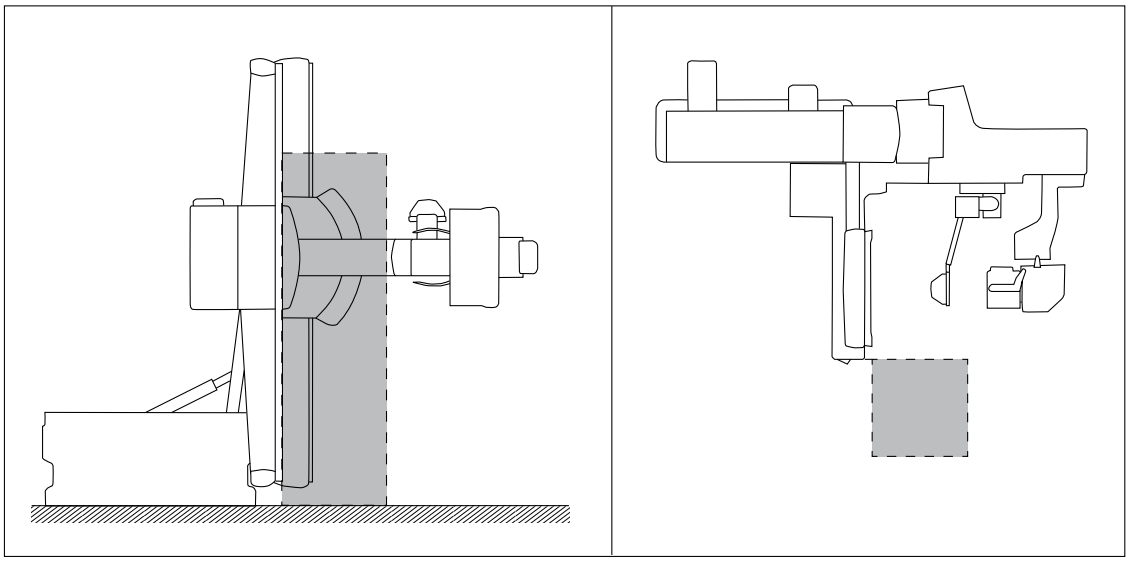

Fig. 7: Front view of vertical table and top view of vertical table (right)

Minimum size of significant zone of occupancy:

- Floor area: 600 mm x 600 mm (23.6 in x 23.6 in)
- Height: 2,000 mm (78.7 in)

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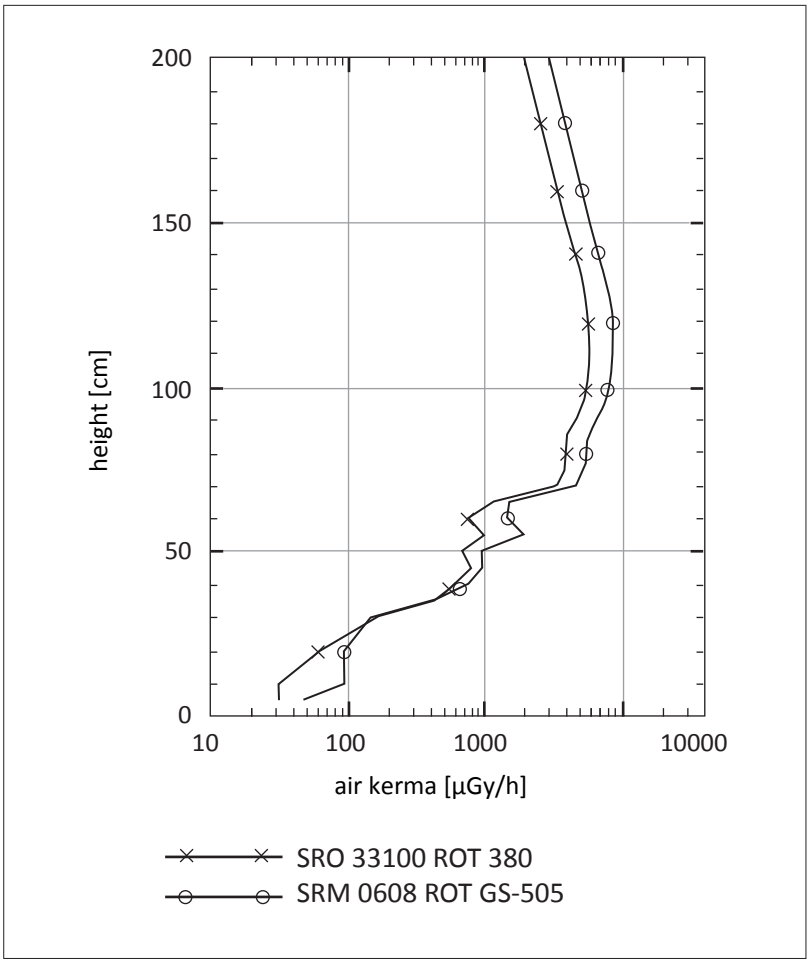

Fig. 8: Distribution of stray radiation within the significant zone of occupancy when the X-ray beam is horizontal

Radiation Dose Management

For pediatric examinations, Philips grid-controlled fluoroscopy (GCF) enables a dose rate* reduction up to 68 %** compared to pulse-controlled fluoroscopy (PCF), depending on patient type and clinical application.

* Dose rate determined according to IEC 60601-2-54, 203.5.2.4.5.102 with the following system set-up:

- Detector format: 43 cm × 43 cm (17 in × 17 in)
- Patient type: children
- 0.1 mm Cu + 1 mm Al
- Reduced dose
- Pulsed slow fluoroscopy mode with 2 pulses/s
- Phantom: 5 cm (2 in) PMMA

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** Relative difference of two reference air kerma rates between

- Systems with grid-controlled fluoroscopy (GCF)

  and

- Systems with pulse-controlled fluoroscopy (PCF)

This system supports different means of quantitative and qualitative dose management:

Clinical Protocols

A set of default clinical protocols is available on the system. These examination protocols are recommendations for adequate operation of the equipment according to its intended use. The protocols contain parameters for image generation, image processing, and display. They provide reasonable image quality at sufficiently low dose levels according to the ALARA principle (As Low As Reasonably Achievable). The EPX validation and administration tool allows the advanced user to manage the examination protocols. Default protocols can be complemented with more specific ones. Protocol parameters can be displayed, exported, and printed.

Dose Area Product Indication

With the dose area product (DAP) option, the radiation dose applied to the patient can be directly displayed in the generator area (for radiography) or on the RF viewer (for fluoroscopy). The displayed value is the product of the average dose and the irradiated area. Therefore, it is independent of the distance from the X-ray source.

Skin Dose Indication

Skin dose values are displayed in the generator area and on the RF viewer. These values of reference air kerma (rate) apply to a reference plane of 30 cm (11.8 in) above the table top.

Detector Dose Indication

The radiation dose at the image receptor is indicated by the exposure index EI_s. Deviations from the target dose at the image receptor are visualized in the user interface.

Quality Assurance Tool

The Quality Assurance Tool (QA Tool) provides several, configurable overviews of the examination parameters and the radiation dose when using digital detectors. It can be used for a statistical analysis of radiographic exposures in regard to quality sensitive parameters. It provides analyses for internal quality control, for workflow improvements, and for reports to public authorities. The QA tool offers predefined analyses on important QA parameters, for example, on the dose information provided by the EI_s values and on the DAP level. You may select the parameters to be analyzed. The QA tool is optional for the Eleva Workspot. The corresponding license must be installed.

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Quantitative Dose Estimation

The expected radiation quantity for each examination can be calculated from the X-ray parameter presets contained in the EPX database, but the exact amount of radiation dose applied to patients depends on the specific exposure settings. It can be simulated by exposing water equivalent phantoms according to IEC 60601-2-54. Diagnostic reference levels can be used for orientation and comparison purposes, see ICRP, 2017. Diagnostic reference levels in medical imaging. ICRP Publication 135. Ann. ICRP 46(1). Examples of diagnostic reference levels published by national and international organizations are:

- IPEM/NRPB/RCR/CoR/BIR Diagnostic Reference Levels Working Party (United Kingdom)
- ACR Practice Guideline for Diagnostic Reference Levels in Medical X-Ray Imaging (USA)
- Code 35: Safety Procedures for the Installation, Use and Control of X-ray Equipment in Large Medical Radiological Facilities - Section A 3.5 Diagnostic Reference Levels (Canada)
- Bundesamt für Strahlenschutz: Bekanntmachung der aktualisierten diagnostischen Referenzwerte für diagnostische und interventionelle Röntgenuntersuchungen (Germany)

In general, the typical patient dose remains considerably below those diagnostic reference levels. The following table states mean values of dose area product and the associated range of variation caused by differences in, for example, patient type or by specific preferences regarding exposure settings and protocols. These values are based on a sample of 93122 exposures taken in 11 European and US hospitals (compare Radiation Protection Dosimetry, Vol. 114, Nos 1-3, pp. 131-134, 2005).

Body part	Dose area product [µGym²]		
	Mean value	Range of variation	
		From	To
Pelvis ap	**84,0**	47,3	248,8
L-spine ap	**82,6**	44,7	157,2
L-spine lat	**128,3**	69,6	276,9
Skull lat	**19,0**	6,1	31,3
Skull ap/pa	**24,8**	13,7	37,0
Chest pa	**7,5**	5,3	20,9
Chest lat	**24,9**	15,3	59,4

Radiation Dose and System Imaging Performance

The European Commission Radiation Protection N° 162 report “Criteria for Acceptability of Medical Radiological Equipment” (RP162) defines a set of quality criteria and suspension levels for diagnostic radiology equipment.

The document “Leitlinien der Bundesärztekammer zur Qualitätssicherung in der Röntgendiagnostik” (“X-ray diagnostics guidelines for quality assurance by the federal medical association, Germany”) relates criteria for acceptability according to RP162 to the intended use as follows:

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Intended use	Radiation dose level	System imaging performance
Radiography examinations with digital radiation detectors	Detector dose	Limiting spatial resolution
Peripheral Skeleton	≤ 10 µGy	≥ 2,8 Lp/mm
Trunk	≤ 5 µGy	≥ 2,4 Lp/mm
Position control Pediatric examinations	≤ 2,5 µGy	≥ 2,0 Lp/mm

This equipment complies with the criteria shown in the table as well as with further, system-related metrics of imaging performance defined in RP162 and the referenced documents.

Typical Patient Entrance Dose Values for Pediatric Extremities

The following table shows typical values of the patient entrance dose for exposures on the wall stand with an SID of 100 cm (39.4 in) and no added filter. The dose values are calculated from the typical yield of the X-ray tube.

For further information, see the Philips White Paper “Optimizing image quality and dose in digital radiography of pediatric extremities”.

Body part	Patient type	EI_T: 500			EI_T: 250		
		kV	mAs (R20)	Typical patient entrance dose [µGy]	kV	mAs (R20)	Typical patient entrance dose [µGy]
Hand ap	Newborn	50	2.5	52	40	5.0	55
	Baby	50	2.8	58	40	5.6	62
	Child	50	3.1	65	40	6.3	69
Hand lat	Newborn	50	2.8	58	40	5.6	62
	Baby	50	3.1	65	40	6.3	69
	Child	50	3.5	73	40	7.1	78
Wrist ap	Newborn	50	3.1	65	40	6.3	69
	Baby	50	3.5	73	40	7.1	78
	Child	50	4.0	83	40	8.0	88
Wrist lat	Newborn	50	4.5	94	40	11.2	123
	Baby	50	5.0	104	40	12.5	138
	Child	52	5.0	116	40	14.0	154
Foot ap/obl	Newborn	50	4.0	83	40	9.0	99
	Baby	50	4.5	94	40	10.0	110

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Body part	Patient type	EI_T: 500			EI_T: 250		
		kV	mAs (R20)	Typical patient entrance dose [µGy]	kV	mAs (R20)	Typical patient entrance dose [µGy]
	Child	50	5.6	117	40	12.5	138
Foot lat	Newborn	50	4.0	83	40	9.0	99
	Baby	50	5.0	104	40	11.2	123
	Child	50	6.3	131	40	14.0	154
Ankle ap	Newborn	50	5.6	117	40	12.5	138
	Baby	50	7.1	148	40	16.0	176
	Child	55	6.3	168	40	20.0	220
Ankle lat	Newborn	50	5.0	104	40	11.2	123
	Baby	50	5.6	117	40	14.0	154
	Child	55	5.0	133	40	18.0	198

For further information on pediatric applications, please check:

- http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/MedicalImaging/ucm298899.htm and
- Image Gently website http://www.imagegently.org

Modes of Operation for Fluoroscopy and Serial Radiography

For the modes of operation and the available settings for fluoroscopy and serial radiography, see chapter “Overview” on page 112.
The default settings and loading factors of the typical modes of operation are provided by examination-specific clinical protocols. An initial set of manufacturer default protocols is available.

Representative Values of the Reference Air Kerma Rate

The patient entrance reference point is located at 30 cm above the table top.
Minimum values of the reference air kerma rate are usually related to reduced dose settings and low frame speeds.

Reference Air Kerma Rate for Systems with Pulse Controlled Fluoroscopy (PCF)

	Reduced dose [1] [mGy/min]	Normal dose [1] [mGy/min]	High quality [1] [mGy/min]	Reduced dose [1] [mGy/min]	Normal dose [1] [mGy/min]	High quality [1] [mGy/min]
	43 cm x 43 cm (17 in x 17 in)			15 cm x 15 cm (5.9 in x 5.9 in)		
Patient type adult normal, filter 0 Al, 5 cm PMMA						

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	Reduced dose [1] [mGy/min]	Normal dose [1] [mGy/min]	High quality [1] [mGy/min]	Reduced dose [1] [mGy/min]	Normal dose [1] [mGy/min]	High quality [1] [mGy/min]
	43 cm x 43 cm (17 in x 17 in)			15 cm x 15 cm (5.9 in x 5.9 in)		
Continuous	0.68	1.07	-	1.37	2.21	-
Pulsed fast (6p/s)	0.98	1.54	2.23	2.61	3.3	3.94
Pulsed medium (4p/s)	0.66	1.26	1.72	1.75	2.39	2.85
Pulsed slow (2p/s)	0.44	0.86	1.02	1.01	1.42	1.7
Patient type adult normal, filter 0 Al, 20 cm PMMA						
Continuous	8.49	13.7	-	19.7	32.3	-
Pulsed fast (6p/s)	9.77	11.9	13.8	16.9	22.3	29.4
Pulsed medium (4p/s)	6.4	8.62	10.1	11.2	17	22
Pulsed slow (2p/s)	3.75	5.07	5.89	6.95	10.9	15.2
Patient type children, filter 0.1 Cu + 1 Al, 5 cm PMMA						
Continuous	0.29	0.47	-	0.59	0.94	-
Pulsed fast (6p/s)	0.52	0.7	0.87	0.99	1.3	1.35
Pulsed medium (4p/s)	0.35	0.53	0.65	0.66	0.96	1.17
Pulsed slow (2p/s)	0.22	0.32	0.4	0.4	0.59	0.73
Patient type children, filter 0.1 Cu + 1 Al, 20 cm PMMA						
Continuous	3.74	6.17	-	10.1	17.3	-
Pulsed fast (6p/s)	4.01	5.23	6.3	8.57	12.3	16.8
Pulsed medium (4p/s)	2.74	3.81	4.64	5.76	9.64	13.1
Pulsed slow (2p/s)	1.59	2.35	2.97	3.6	6.68	9.22

[1] Fluoroscopy flavor

SID = 120 cm (47.3 in)

Reference Air Kerma Rate for Systems with Grid Controlled Fluoroscopy (GCF)

	Reduced dose [1] [mGy/min]	Normal dose [1] [mGy/min]	High quality [1] [mGy/min]	Reduced dose [1] [mGy/min]	Normal dose [1] [mGy/min]	High quality [1] [mGy/min]
	43 cm x 43 cm (17 in x 17 in)			15 cm x 15 cm (5.9 in x 5.9 in)		
Patient type adult normal, filter 0 Al, 5 cm PMMA						
Continuous	0.61	0.99	-	1.31	2.11	-
Pulsed fast (6p/s)	0.66	0.86	1.05	1.2	1.59	1.99
Pulsed medium (4p/s)	0.44	0.63	0.78	0.8	1.2	1.47

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	Reduced dose [1] [mGy/min]	Normal dose [1] [mGy/min]	High quality [1] [mGy/min]	Reduced dose [1] [mGy/min]	Normal dose [1] [mGy/min]	High quality [1] [mGy/min]
	43 cm x 43 cm (17 in x 17 in)			15 cm x 15 cm (5.9 in x 5.9 in)		
Pulsed slow (2p/s)	0.27	0.39	0.49	0.48	0.72	0.96
Patient type adult normal, filter 0 Al, 20 cm PMMA						
Continuous	7.72	12.2	-	18	29.6	-
Pulsed fast (6p/s)	6.35	8.27	10.2	13.8	19.1	25
Pulsed medium (4p/s)	4.45	6.11	7.49	9.1	14.6	18.7
Pulsed slow (2p/s)	2.51	3.87	4.83	6.07	9.41	12.5
Patient type children, filter 0.1 Cu + 1 Al, 5 cm PMMA						
Continuous	0.27	0.43	-	0.58	0.97	-
Pulsed fast (6p/s)	0.15	0.23	0.31	0.38	0.59	0.81
Pulsed medium (4p/s)	0.11	0.18	0.24	0.26	0.46	0.62
Pulsed slow (2p/s)	0.07	0.12	0.17	0.17	0.31	0.43
Patient type children, filter 0.1 Cu + 1 Al, 20 cm PMMA						
Continuous	3.41	5.72	-	9.53	16.5	-
Pulsed fast (6p/s)	2.31	3.23	4.59	6.76	10.5	15.6
Pulsed medium (4p/s)	1.5	2.7	3.52	4.6	8.6	12.1
Pulsed slow (2p/s)	0.92	1.8	2.35	3.11	6.02	8.83

[1] Fluoroscopy flavor

SID = 120 cm (47.3 in)

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Laser Light Source

WARNING

Laser radiation

Some components of the system may contain laser light sources of Class 2 or lower. Make sure that no one looks directly into the light beam.
With Class 2 lasers, the eye is protected by the eyelid closure reflex in the event of accidental, brief glances into the laser beam. Therefore, Class 2 lasers may be used without taking any further precautions, if one of the following applies:

- **It is not necessary to look into the beam intentionally for longer than 0.25 s.**
- **It is not necessary to look repeatedly into the laser beam or into the directly reflected beam.**

For continuous-duty Class 2 lasers, the maximum limit for accessible radiation is 1 mW.

Error Messages

WARNING

Even if no error message appears, but the equipment does not work as usual (first signs of a defect), call customer service immediately.

At the Geometry

If an error is detected, a message appears in the display of the ceiling suspension unit.

- ► Write down the message and call customer service.
- ► Restart the system. If the message does not appear any more, continue working with the system as usual.

On the Eleva Workspot

When an error has occurred in the system or a part of it, an error message appears on the operator's console monitor with instructions on how to rectify the error:

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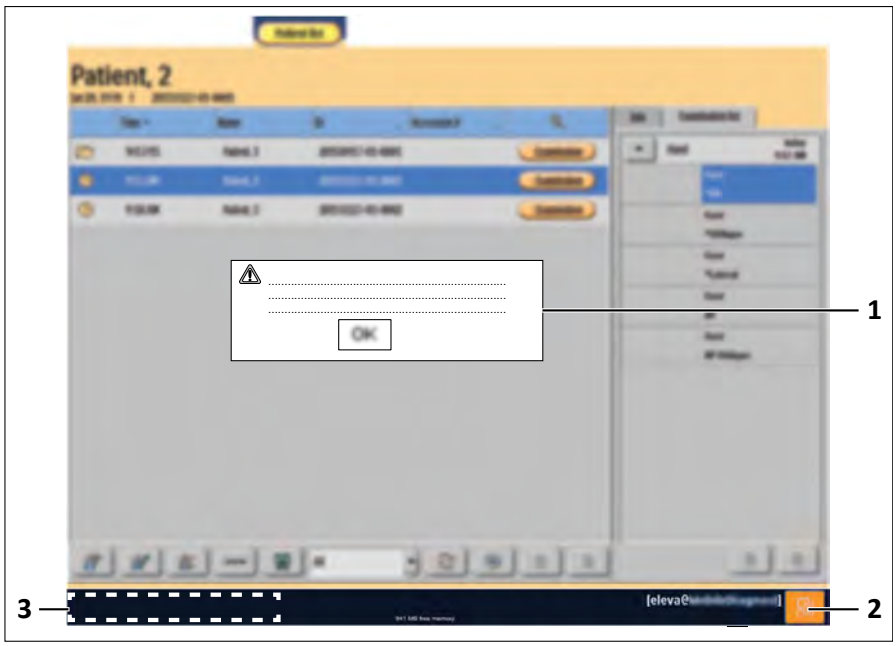
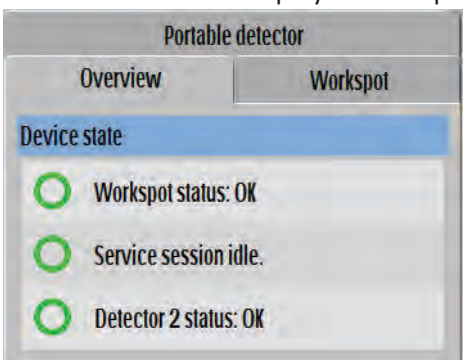


Legend	Function	Meaning	What you must do
1		Error message You will find a list of all messages in the Appendix.	
2		System status display Blue: Status OK Orange: Attention needed Red: Unrecoverable error	Click on status display: More information appears.
3		Message of system status	

► Click on the status display.

⇨ The device status is displayed. Example:



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The following symbols may appear:

Symbol	Meaning
	Green circle: Everything OK
	Yellow triangle: Attention needed For example, printer needs attention.
	Red cross: Unrecoverable error

You will find a list of all error messages in the Appendix.

On the RF Viewer

When an error has occurred in the system or a part of it, an error message appears on the RF Viewer with instructions on how to rectify the error:

No.	Meaning	What you must do
1	Error message	You will find a list of all messages with further information in the Appendix. Confirm the message: Click **OK** or press **F7** on the keyboard.
2	Message of system status	

Making Screenshots

When a message appears, you can save a screenshot of the message for customer service.

- ► Press SHIFT+F11.

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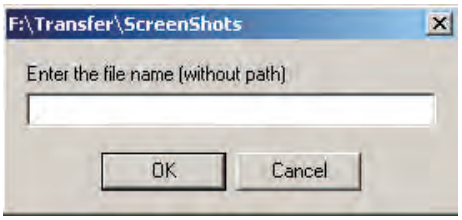
⇨ This window appears:



► Enter a file name and press OK.

⇨ The screenshot is saved on the Eleva Workspot computer and can be accessed by authorized Philips service engineers.

On the Control Console

If an error is detected at the geometry (table), a message appears in the display of the control console.

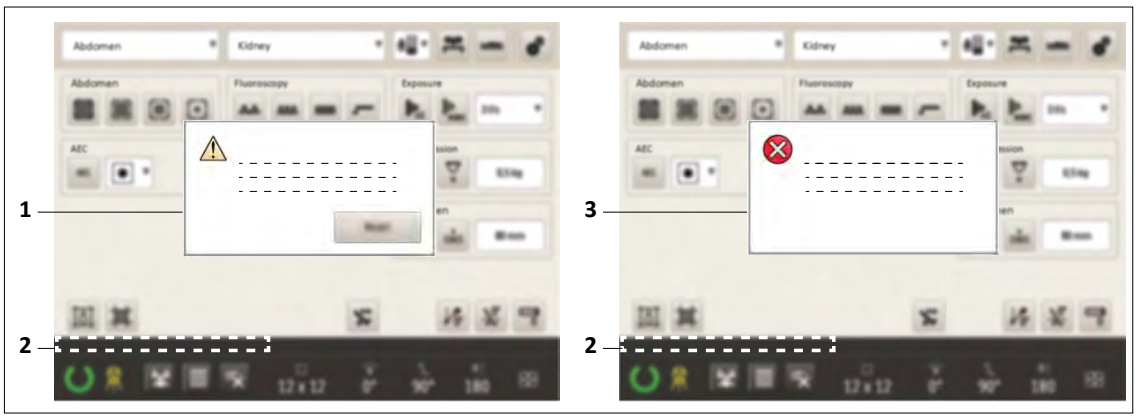


Fig. 9: Error messages resettable (left) and non-resettable (right)

No	Description
1	Error message resettable
2	Status message of geometry (table)
3	Error message non-resettable

► If the message does reappear, write down the message and call customer service.

► Restart the system. If the message does not appear any more, continue working with the system as usual.

You will find a list of all error messages on the control console in the Appendix.

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3 System Description

General

CombiDiagnost R90 is a remote controlled fluoroscopy system in combination with high-end digital radiography. With the CombiDiagnost R90, you receive high-quality images, a fully digital workflow, dynamic UNIQUE image processing, and excellent dose saving features.

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System

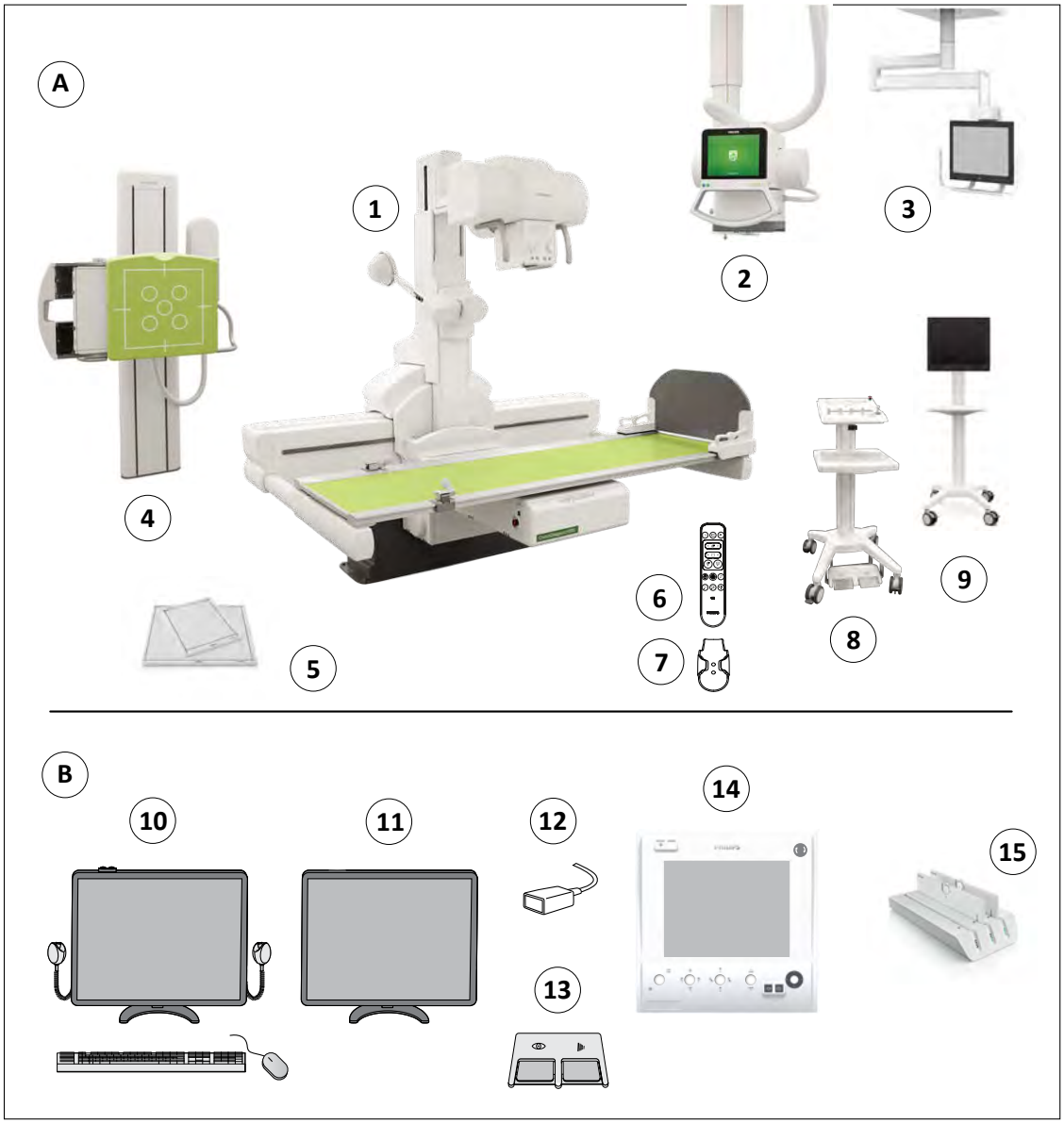

Fig. 10: System components

Legend		Components
A	**Examination room**	
	1	Table
	2	Ceiling suspension with X-ray tube assembly CSM3 (optional)
	3	Ceiling suspension for monitors (optional)
	4	Wall stand (Vertical stand VS) for SkyPlate or with fixed detector (optional)

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Legend		Components
	5	SkyPlate small and large (optional)
	6	Remote control for RF viewer (optional)
	7	Holder for remote control (optional)
	8	Nearby control trolley (optional)
	9	Monitor trolley (optional)
	Not shown	Reference monitor (optional)
B	**Control room**	
	10	Eleva Workspot with integrated generator control, hand switch, keyboard, mouse, touch screen, and PC (not shown)
	12	RF monitor (A second RF monitor is optional in the examination room.)
	12	Infrared adapter for connecting the SkyPlate to the system (optional)
	13	Foot switch (A second foot switch is optional in the examination room.)
	14	Control console (A second control console is optional in the examination room.)
	15	Battery charger for SkyPlate batteries (optional)
	Not shown	Reference monitor (optional, depending on country availability)

System Components

Eleva Workspot and RF Viewer

Overview

The operator’s console has a touch screen monitor, keyboard, and mouse.

The R/F Viewer is a standard monitor without a touch screen, that switches on/off automatically with the Eleva Workspot.

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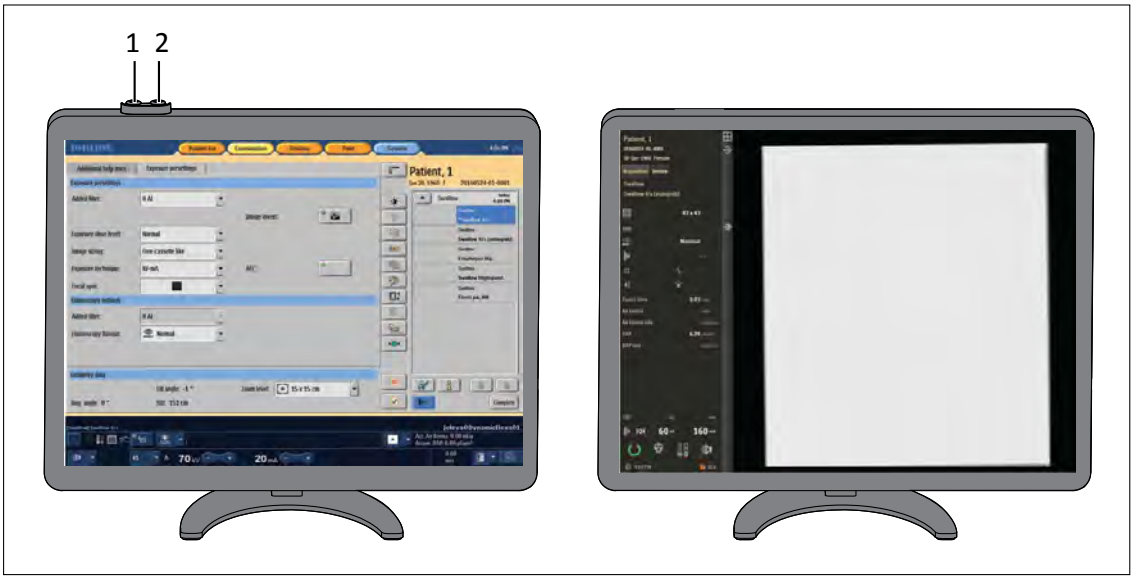

Fig. 11: Eleva Workspot (left) and RF viewer (right)

No.	Function
1	• Switch on the Eleva Workspot and all other components (including the X-ray system geometry) • Restart running the Eleva Workspot by pressing the button for 4 s
2	Switch off the Eleva Workspot and all other components (including the X-ray system geometry)

Operator's Console

Fig. 12: Sections of the operator's console

You can select the different sections using the main selector buttons (1-5). When a section is selected, the corresponding button turns yellow.

The different sections provide the following functions:

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No.	Function	Meaning
1	**Patient list**	Here you can enter patient data or select patients from a list provided by RIS. You can assign types of examination to the patient or use the examination types from RIS. If a patient has been selected in the Patient list section, this selection is retained when you go into the other sections.
2	**Examination**	Here you can do the following: • Select the examination. • Select the registration device. • Set the generator. • Release X-ray exposures. Here you find the advanced image manipulation tools for: (for radiography images only) • Modifying images • Processing images • Saving to an archive
3	**Review**	Here you will find the following tools: • Advanced image manipulation tools for: (for radiography images only) – Modifying images – Processing images – Saving to an archive • An overview of the patient's images.
4	**Print** (optional)	You will find the printing tools here. You can print one or more images to a film and determine the image size and image field. The print function is available for radiography images only.
5	**System**	You can check the status queue for DICOM Export and Print. You can exit the application program and log out. For the administrator only: Setting administration and customization functions.

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RF Viewer

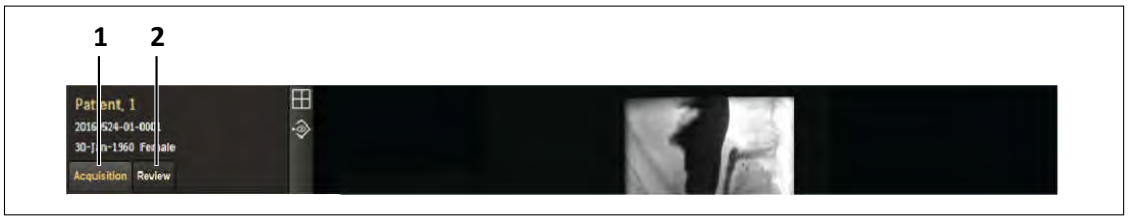

Fig. 13: Sections of the RF viewer

No.	Function	Meaning
1	**Acquisition**	Live fluoroscopy and spot images are displayed. Display of the system settings, for example, geometry position, generator settings, dose.
2	**Review**	Here you will find • Image runs that can be replayed. • Advanced image manipulation tools for modifying images, for processing images, and for saving to an archive. • An overview of the patient's images.

When you are in the Examination or Review section on the Eleva Workspot, the RF Viewer is on and you can switch between Acquisition and Review section.
When you press one of the foot switch pedals, the RF viewer switches automatically to the Acquisition section.

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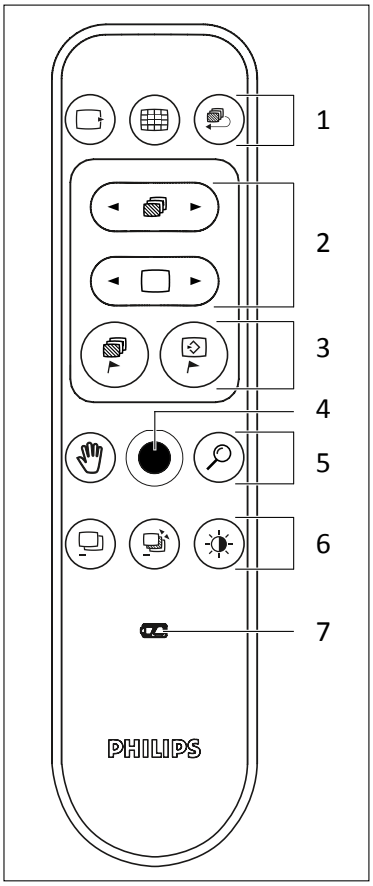
Remote Control



No.	Meaning
1	• Send image to reference monitor • Select tile view area • Replay run
2	• Select previous or next run • Select previous or next image • Move cursor up, right, left or down
3	• Flag run • Flag image or grab image
4	Joystick
5	• Select pan image • Select scaling
6	• Select subtraction • Select remask/landmarking • Select contrast and brightness
7	Charging indicator

UPS for Eleva Workspot (Optional)

The UPS (uninterruptable power supply) protects the Eleva Workspot from power outages. In the event of a power outage, the UPS powers the Eleva Workspot for approximately 60 minutes.

The UPS is installed by customer service. Under regular operation, it shall not be turned off.

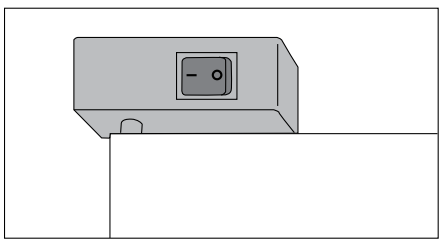


Fig. 14: UPS switch located on the top of the M-cabinet

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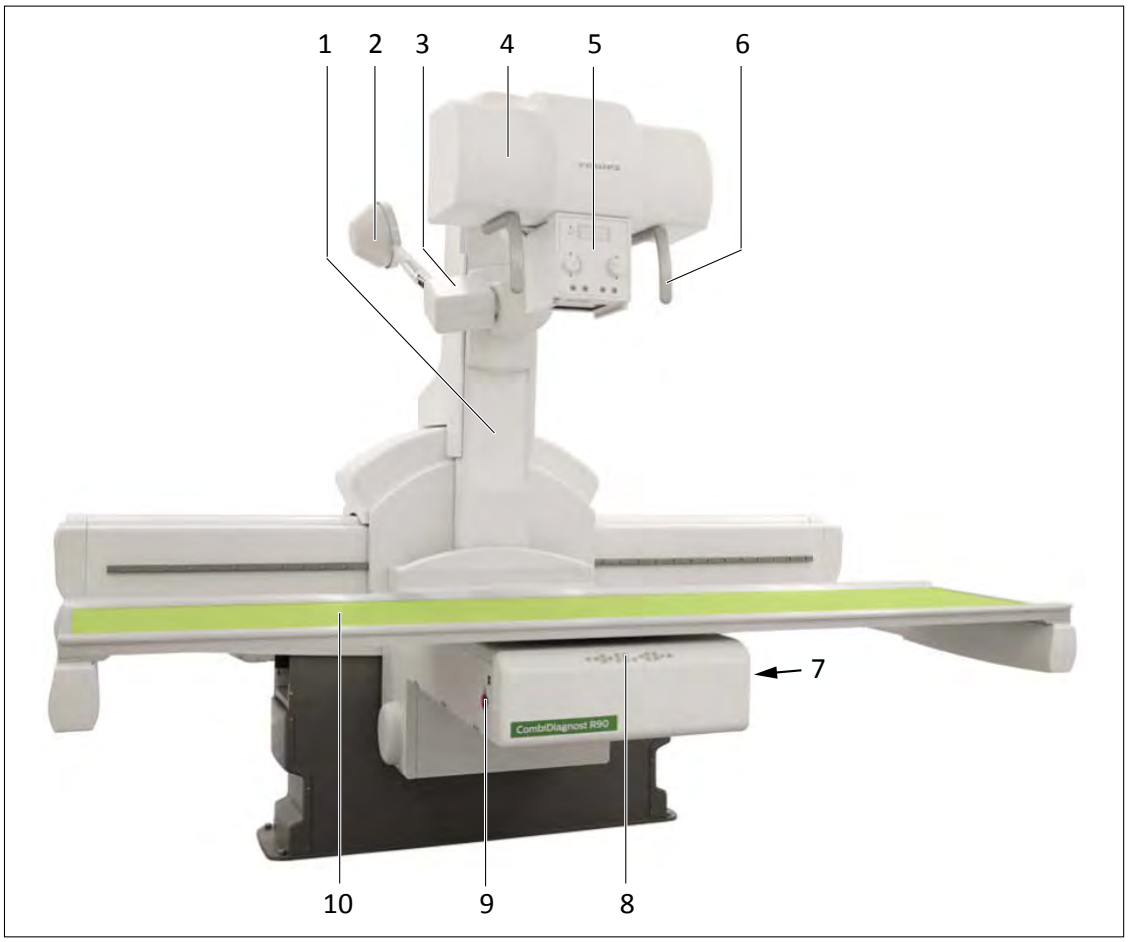
Table



No.	Meaning
1	Column, includes the X-ray tube assembly and the dynamic detector
2	Compression cone
3	Compressor
4	X-ray tube
5	Collimator
6	Hand grips for manual rotation of the X-ray tube assembly
7	Switch the table control panel on/off
8	Table control panel
9	Emergency stops on both sides
10	Table top

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Table Control Panel

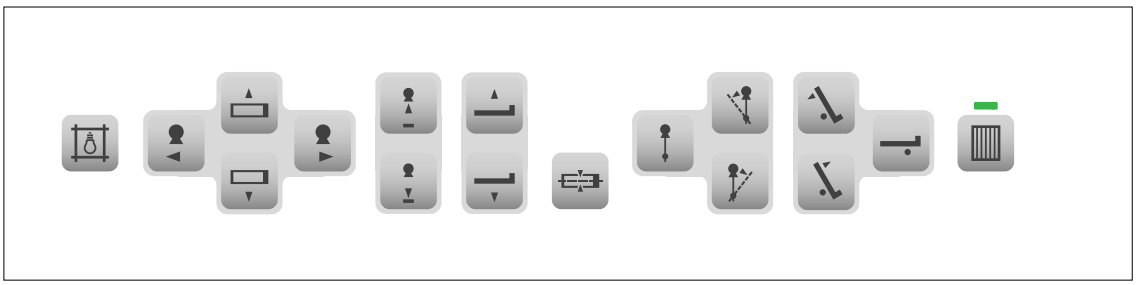

Fig. 15: Table controls on table control panel

Button	Meaning
	Switch on/off the light field
	Move the column to the left
	Move table top inwards (towards the column)
	Move table top outwards (away from the column)
	Move the column to the right
	Increase SID
	Decrease SID
	Raise the table
	Lower the table
	Move table top to the center

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Button	Meaning
	Angle the column to the center (0°)
	Angle the column counter clockwise
	Angle the column clockwise
	Tilt the table counter clockwise
	Tilt the table clockwise
	Tilt the table to the horizontal position (0°)
	Move grid into and out of the beam path. The LED shows the grid status. When the green LED is on, the grid is in the beam path.

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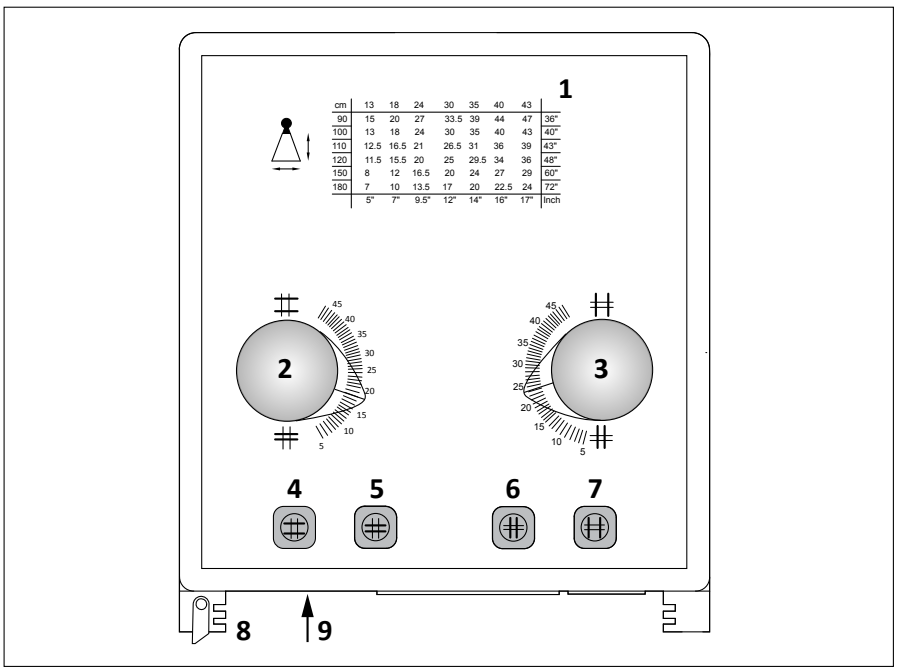
Collimator



No.	Meaning
1	SID table
2	Display value of transverse collimation
3	Display value of longitudinal collimation
4	Open the collimator transversely
5	Close the collimator transversely
6	Close the collimator longitudinally
7	Open the collimator longitudinally
8	Rails, for example, for insertion of additional filters
9	Tape measure for measuring non-default SID

NOTICE

Do not move 2 and 3 as they are displays only. Use buttons 4 to 7 to open or close the collimation.

For radiography, you can rotate the collimator to ±45° around its vertical axis.

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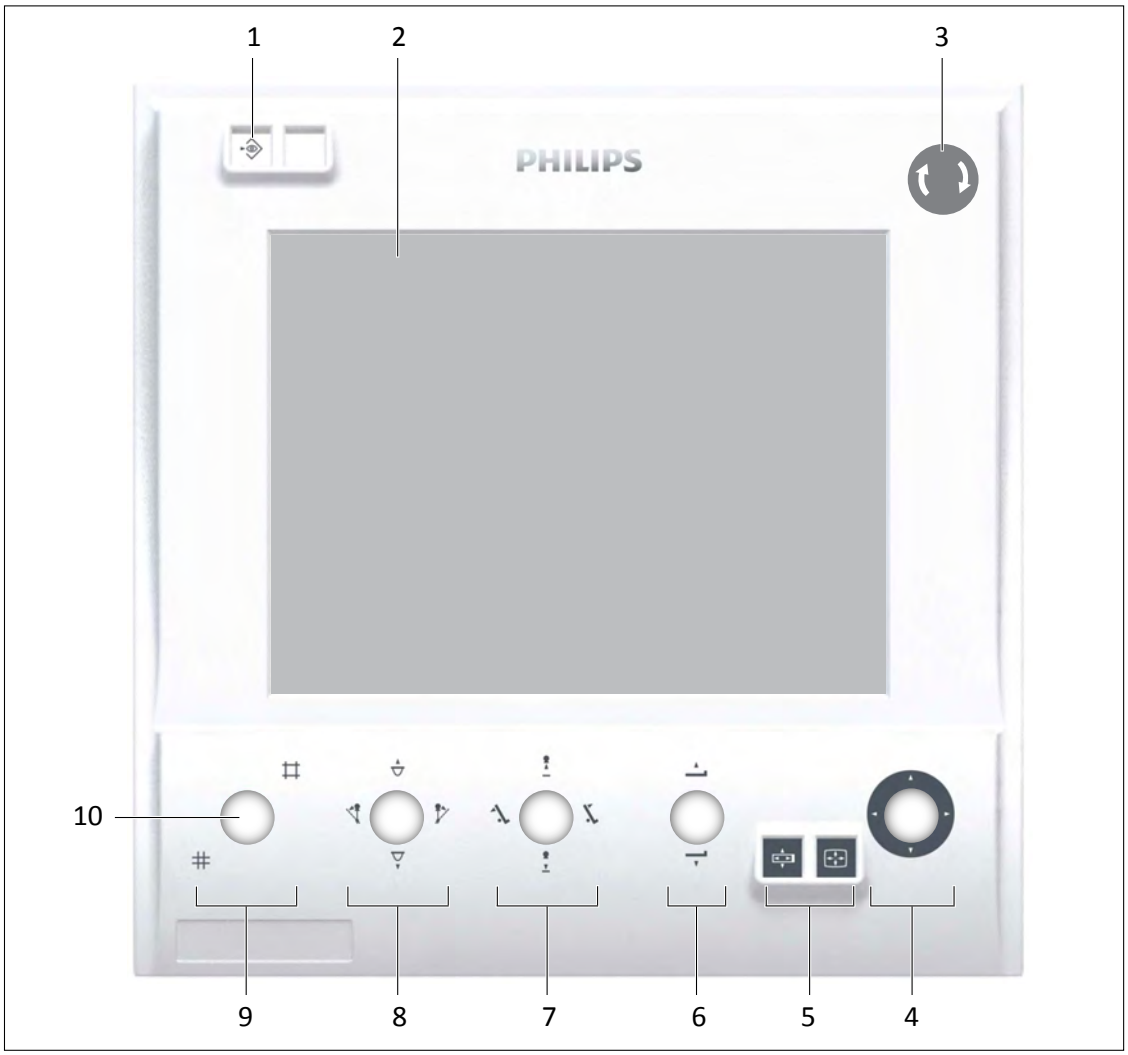
Control Console

Console



No.	Symbol	Meaning
1		Grab fluoroscopy images Grab one image: Press the button once. Grab multiple images: Press and hold the button.
2		Display
3		Emergency stop button
4		The arrows show the direction of the table and column movement. These movements depend on the movement-orientation mode set with 5.

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No.	Symbol	Meaning
5		Table-movement orientation
		Monitor-movement orientation
6		Raise the table
		Lower the table
7		Increase SID
		Decrease SID
		Tilt the table counter clockwise
		Tilt the table clockwise
8		Raise the compression cone
		Lower the compression cone
		Angle the column counter clockwise
		Angle the column clockwise
9		Open the collimation
		Close the collimation
10		Joysticks

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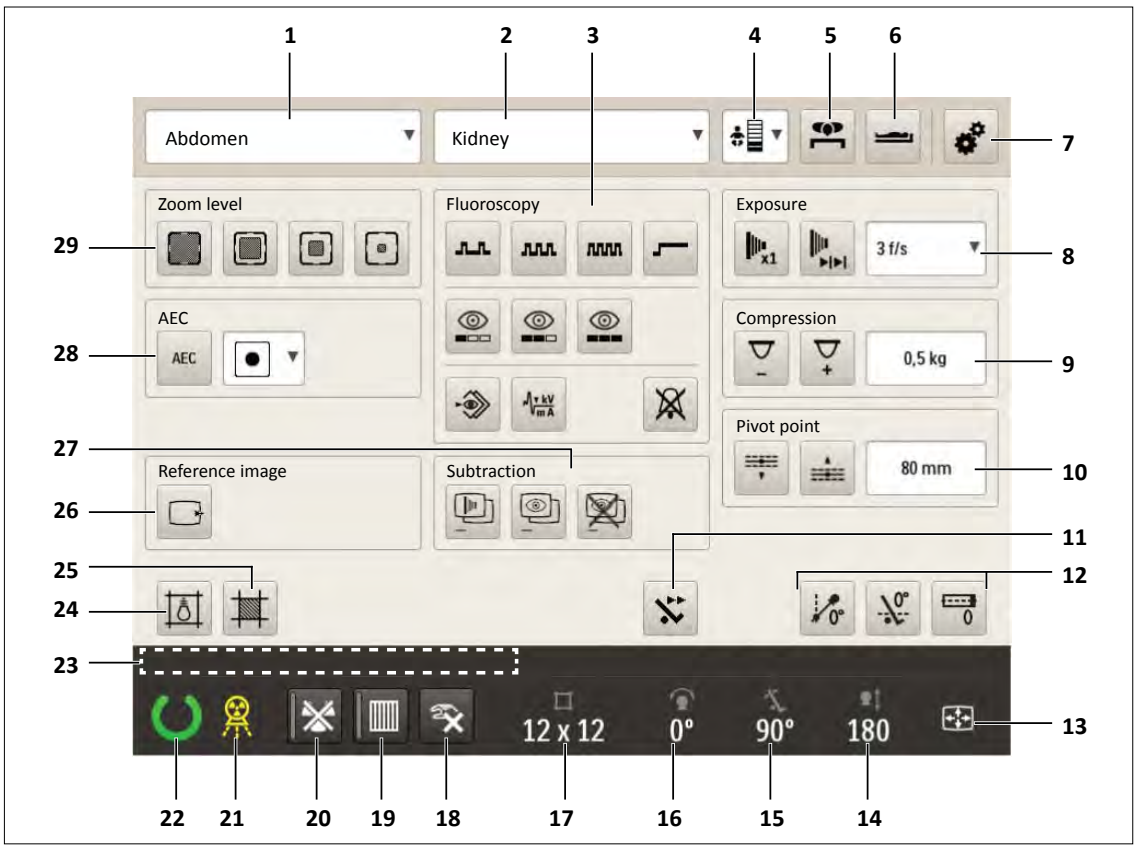
Display



No.	Meaning
1	Display the examination name selected on Eleva Workspot
2	Display the view name selected on Eleva Workspot
3	Select fluoroscopy modes: • Set fluoroscopy frame speed • Set fluoroscopy flavor • Activate/deactivate dynamic fluoroscopy grab (auto grab) • kV/mA lock-in • Silence the fluoroscopy alarm time
4	Change the patient type
5	Select patient orientation: Prone position (flip image horizontally)
6	Select patient orientation: Head at foot end (rotate image 180°)
7	Change control console settings
8	Set the spot exposure type

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No.	Meaning
9	Set the compression force
10	Set the pivot point (configurable, whether this option shows up on the display)
11	Select fast table speed
12	Activate centering
13	Display movement orientation
14	Display set SID
15	Display table tilting
16	Display column angling
17	Display collimation size
18	Select manual reset
19	Select grid in or out
20	Disable X-ray
21	Light up during exposure
22	Display “ready for exposure”
23	System messages
24	Switch on the light-field indicator
25	Reset the collimation to the preset size
26	Send image to reference monitor
27	Select subtraction functions
28	Select AEC
29	Set the detector-field size (zoom level)

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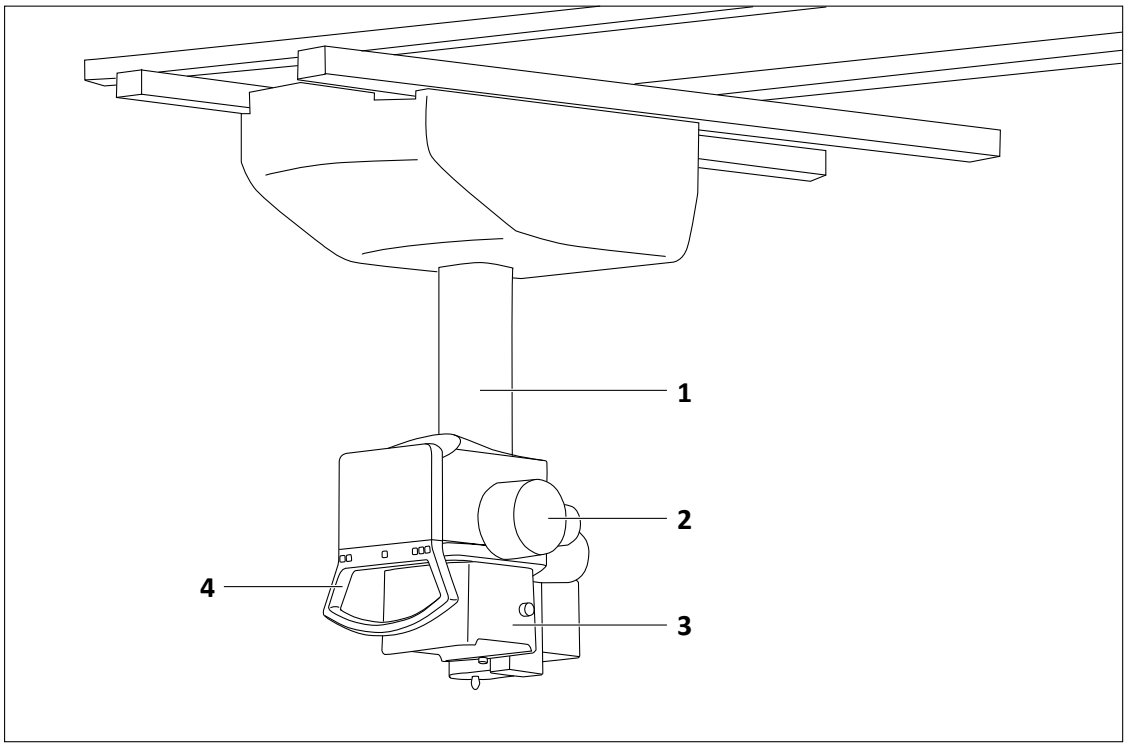
Ceiling Suspension CSM3 (Optional)

Ceiling Suspension CSM3

Main Components



1	Ceiling suspension unit
2	Tube assembly
3	Collimator
4	Control grip

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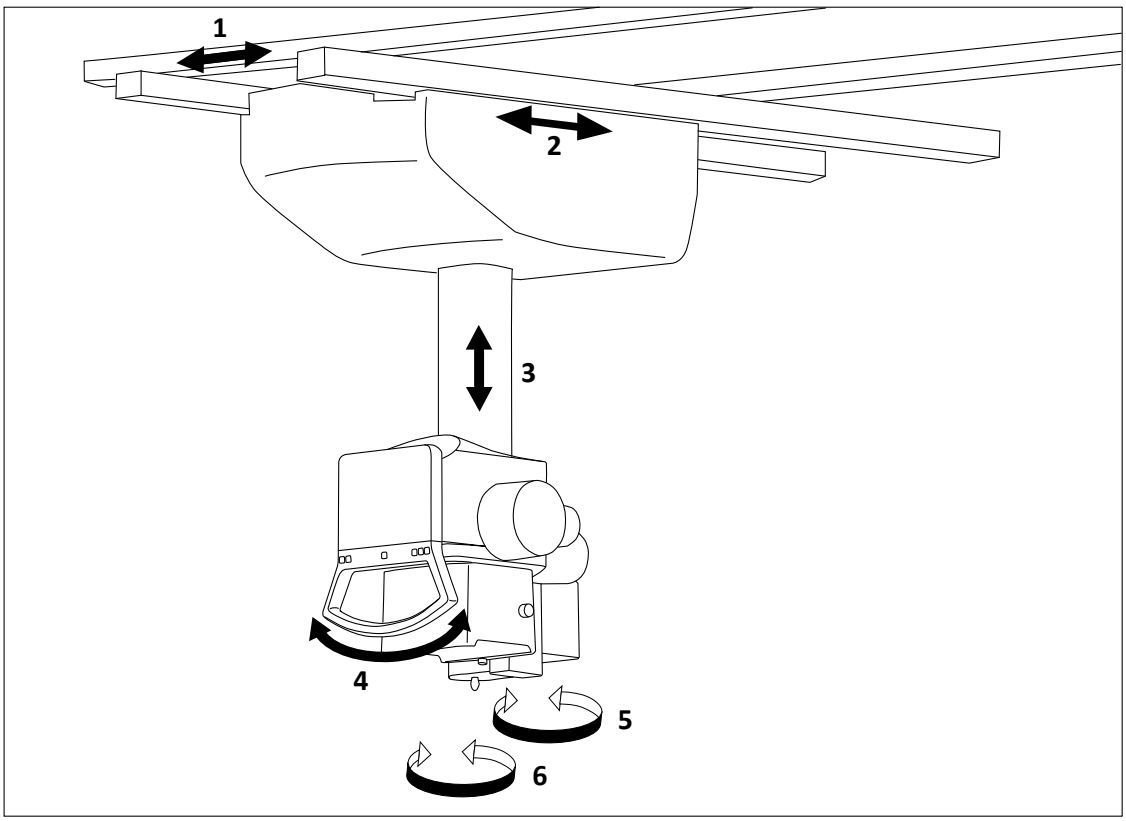
Function



The Ceiling Suspension CSM3 can be freely moved longitudinally and transversely. The telescoping column allows the tube assembly, collimator and control grip to move vertically up and down.

The directions of linear movements are **color-coded**. You will find the colors on the corresponding buttons at the control grip and on the ceiling suspension unit.
They are as follows:

1	Green	Movement along the table top
2	Blue	Movement at right angles to the table top
3	Yellow	Raise/lower
4	White	Tilt of tube assembly
5	White	Rotation of the tube assembly
6	none	Rotation of the collimator around the radiation beam axis

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Eleva Tube Head

1		Control Handle Display
2		Enable the rotation of the tube assembly round the stand axis.
3		Enable the angulation of the tube assembly round its transverse axis.
4		Enable the vertical movement of the tube assembly.
5		Control Handle Bar
6		Tape measure for measuring the SID
7		Central laser
8		Slider for covering the SID laser and the central laser

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9	SID laser (optional)
10	Live camera (optional)
11	Collimator rails for filters and accessories.
12	Touch sensor to enable the following movements: • Tube assembly longitudinally and • Tube assembly transversely and • Raise or lower the tube assembly
13	Knobs for setting the collimation field size
14	Collimator
15	 Switch on the light field indicator and both lasers. The lasers switch off automatically.
16	 Enable the transverse movement of the tube assembly.
17	 Enable the longitudinal movement of the tube assembly.

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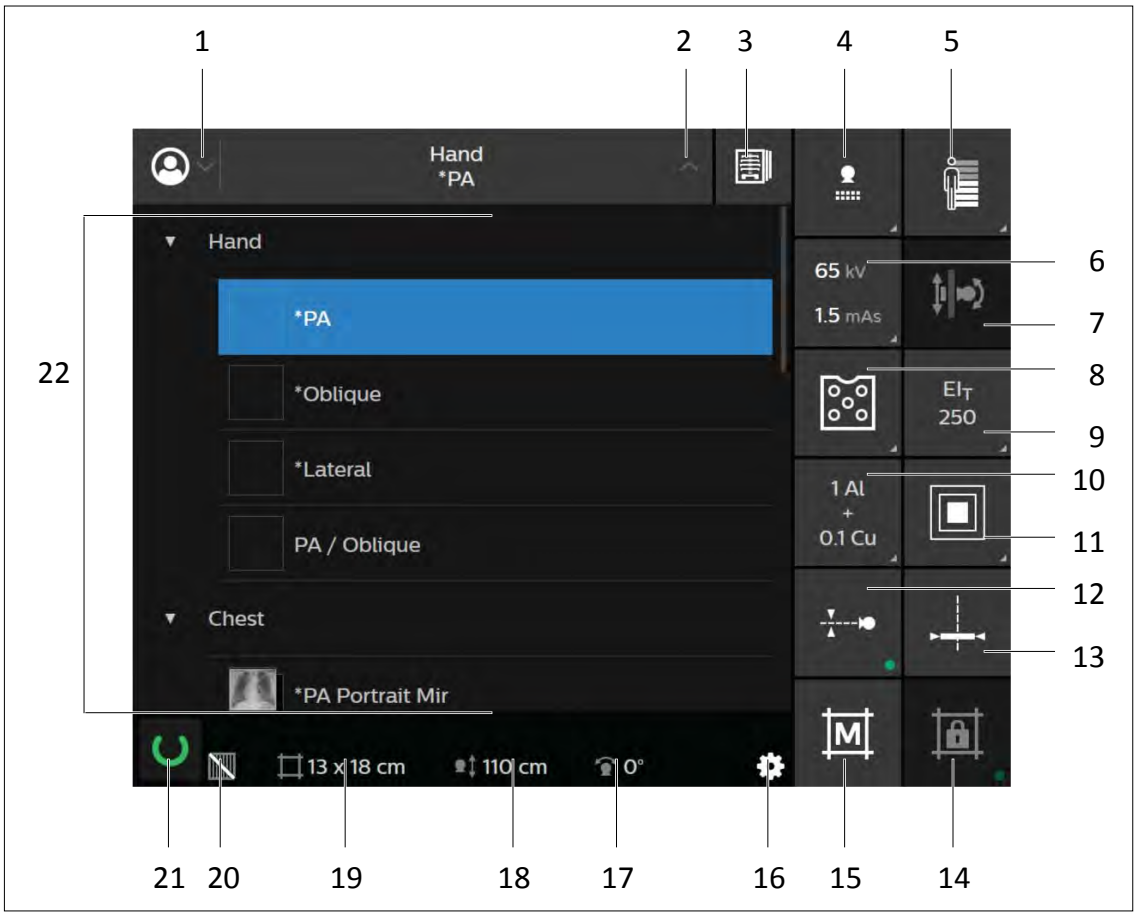
Display of the Eleva Tube Head



No.	Description
1	Show or hide the patient data
2	Show or hide the list of examinations and associated views
3	Display the currently taken images of the selected patient (The button is only active if there are current images of the patient available.)
4	Select the registration device
5	Select the patient type
6	Select the exposure settings
7	Test run for stitching (without radiation, only visible with the stitching license)
	 Stitching with wall stand
8	Settings for automatic exposure control

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No.	Description
9	Select the target exposure index (EI_T)
10	Select an added filter
11	Select the focal spot
12	Switch tracking on or off
13	Alignment of the detector to the central X-ray beam
14	Enable or disable the collimation restriction (rights can be configured by the Advanced User only)
15	Collimation memory function • Sets the collimator to the last value that was set manually. • Sets the collimator to the value that is preset by the APR program.
16	Settings of the Eleva Tube Head display • Brightness • Test images (only for customer service)
17	Angulation of X-ray tube assembly (transverse axis)
18	SID (cm or in)
19	Radiation field size (cm × cm or in × in)
20	Grid status
21	Ready for exposure  You can release exposures.  You cannot release any exposures. Click the icon to display the system messages.  You cannot release any exposures. The ceiling suspended X-ray tube assembly is not active.
22	In this area the following can be displayed: • Scheduled examinations and views for the selected patient (shown in the example) The drop-down list must be opened (position 2 in the image above). • Preview image (on the entire screen, not shown in the example) • Currently taken images of the selected patient (on the entire screen, not shown in the example) The review button must be selected (position 3 in the image above). • Image from the live camera (not shown in the example, only visible with license) • Symbol for live camera on/off (not shown in the example, only visible with license):

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No.	Description	
		Switch on the live camera
		Switch off the live camera
		Problem with the live camera Restart the system when this symbol appears. If restart is not successful, contact customer service.

You can use the touch screen on the Eleva Tube Head with medical gloves.

NOTICE

Switching the preview image on or off

The preview image appears for 30 seconds at the Eleva Tube Head (default setting). You can switch off the preview image for the current patient in the **Examination** section of the Eleva Workspot (see the Instructions for Use Eleva Workspot).

Additionally, customer service or the application specialists can change the settings to one of the following:

- Different time interval for the preview image (5 seconds to 1 minute)
- Switch off the preview image permanently

Wall Stand (Vertical Stand VS) (Optional)

Overview

These Instructions for Use describe the unit assuming operation from the left-hand side. A right-handed unit must be operated accordingly. A stretch grip is an available option, which can be fixed above the detector or wireless tray.

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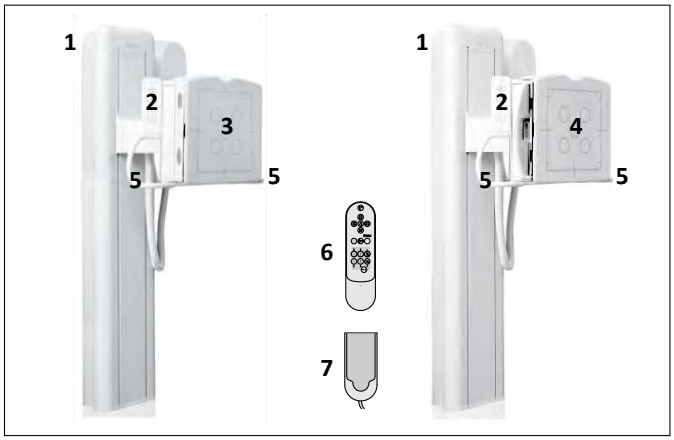
Components



1	Column
2	Control panel (on both sides of the detector)
3	Fixed detector with • Collision guard • Display of the position of the automatic exposure control measuring fields • Chin rest
4	Wireless tray with • Collision guard • Display of the position of the automatic exposure control measuring fields • Chin rest
5	Patient grips (right and left)
6	Remote control (optional)
7	Charging station for the remote control (optional)

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Control Panel and Remote Control

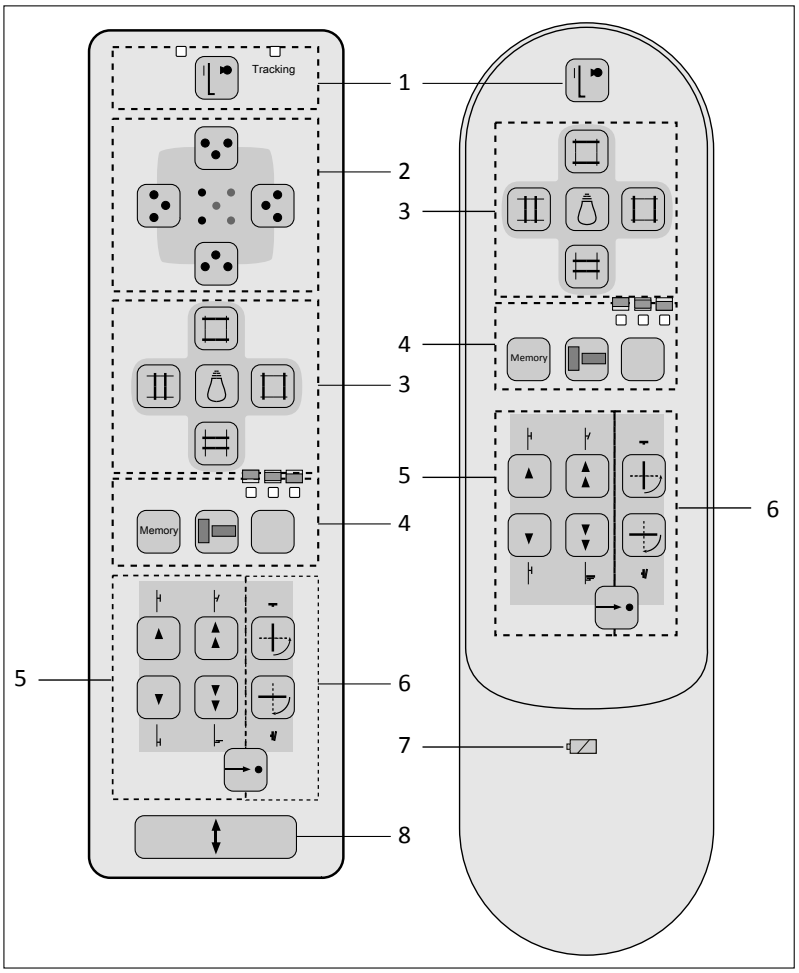

Fig. 16: Control panel (on the left) and remote control (on the right)

No.	Symbol	Meaning
1		Registration device selected
		Select the registration device. Tracking is on. Press again to switch tracking off.
	 Tracking	LED lit: tracking on.

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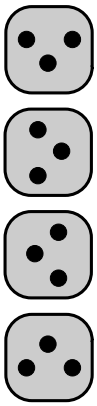
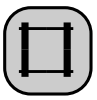
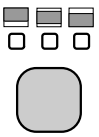
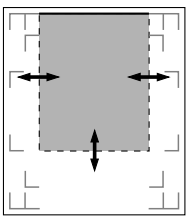
No.	Symbol	Meaning
2		Select the measuring field group. The exposure measuring chamber has 5 measuring fields. With these buttons, you can select three of them as shown on the buttons. Alternatively, you can select the measuring fields at the Eleva Workspot in the generator area. The LEDs indicate which measuring fields are active. • The top edge of the front panel is defined by the chin rest. • Orientation of the measuring fields to the top or bottom refers to the chin rest.
3		Switch on the light field indicator.
		Open the radiation field transversely.
		Close the radiation field transversely.
		Open the radiation field longitudinally.
		Close the radiation field longitudinally.
4		(only with tracking); At the remote control: Press once: The current status is displayed. Press again: Switch between centered and off-center collimation. At the control panel: Press: Switch between centered and off-center collimation. After a button is pressed, the LEDs on the remote control light up constantly.
		Top off-center collimation (radiation field lies at top of detector field) The top edge is fixed.

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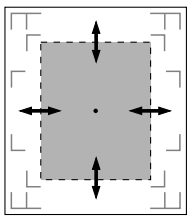
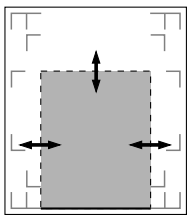
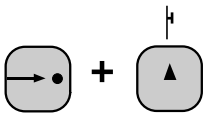
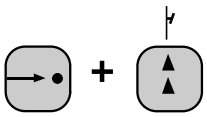
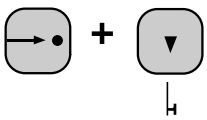
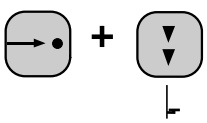
No.	Symbol	Meaning
		Centered collimation The center is fixed.
		Bottom off-center collimation (radiation field lies at bottom of detector field) The bottom edge is fixed.
5		Raise the Bucky unit slowly (motorized) [1]
		Raise the Bucky unit quickly (motorized) [1]
		Lower the Bucky unit slowly (motorized) [1]
		Lower the Bucky unit quickly (motorized) [1]
	Move to position	
		Bucky unit automatically moves into the top vertical position (example: chest position)
		Bucky unit automatically moves upward to −20° (example: skull position)
		Bucky unit automatically moves into the bottom vertical position (example: standing knee position)
		Bucky unit automatically moves into the horizontal position (example: hand position)
	Optional	

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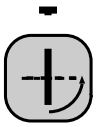
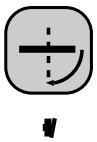
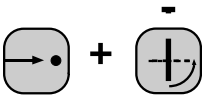
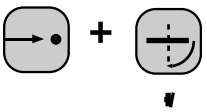
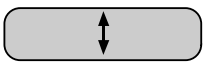
No.	Symbol	Meaning
6		Tilt the Bucky unit into the horizontal position (motorized) [1]
		Tilt the Bucky unit into the vertical position (motorized) [1]
		Bucky unit automatically moves into the horizontal position.
		Detector not vertical: detector moves into the vertical position. The height remains the same. Detector vertical: detector moves to −20°. The height remains the same.
7		Charging indicator
8		Out of a lock: Manually move the detector up/down/longitudinal/lateral. Overriding collision is possible. For your safety: If locked and a Chest PA view is selected, only up/down is possible.

LED	Battery status	Remote control
Off	Battery is charged	Out of charger
Off	Battery is charged	In charger
Flashes quickly	Battery charges	In charger
Flashes slowly	Low battery capacity, charging necessary	Out of charger

[1] “Dead man's principle” – the unit moves only if a button is pressed and held down.

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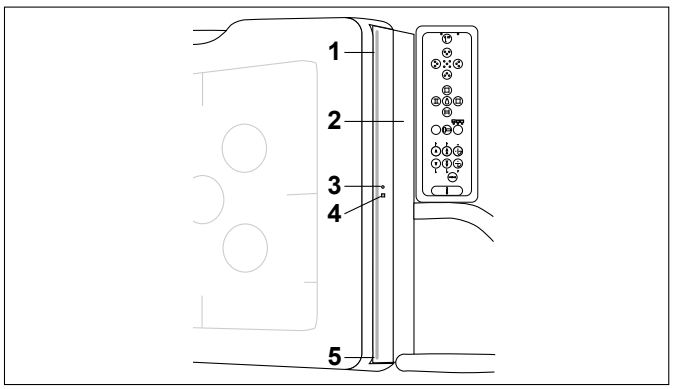
Wall Stand with Fixed Detector



No.	Description	Function
1	Grid opening	For inserting the grid
2	Flap of grid shelf	For parking a grid
3	LED for grid status	ON – grid correctly in place OFF – no grid inserted Flashing – grid carriage is moving or error (e.g. grid jam)
4	Button for loading/ unloading grid	Press to bring the grid carriage into load/unload position or back into working position
5	Release lever (not visible in this picture)	Press to remove the grid from its carriage

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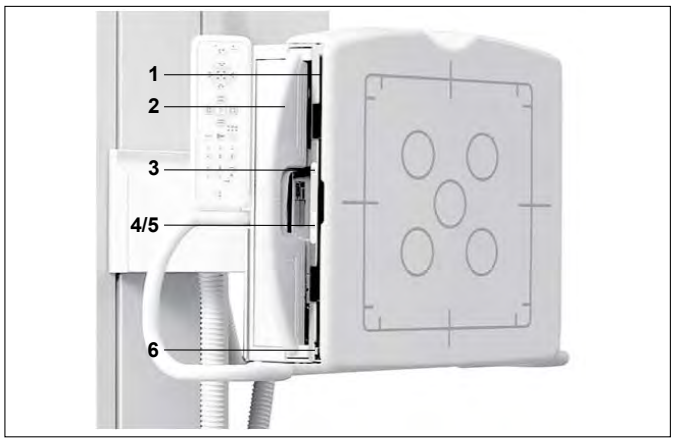
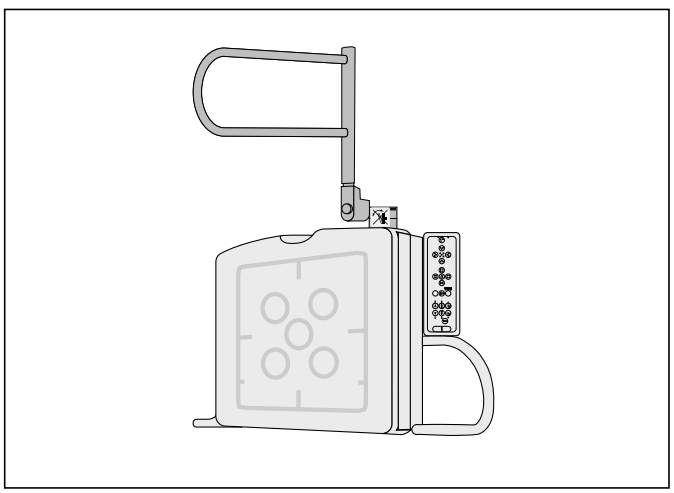
Wall Stand with Wireless Tray



No.	Description	Function
1	Grid opening	For inserting the grid
2	Tray grip	For opening/closing the tray
3	LED for detector status	ON – detector inserted correctly OFF – no detector inserted Flashing – detector inserted incorrectly
4	LED for grid status	ON – grid inserted OFF – no grid inserted Flashing – grid carriage is moving or error (e.g. grid jam)
5	Button for loading/ unloading grid	Press here to bring the grid carriage into load/unload position or back into working position
6	Release lever	Press here to remove the grid from its carriage

Stretch Grip (Optional)



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NOTICE

If the stretch grip is mounted, you can no longer tilt the detector and no motorized movements are possible.

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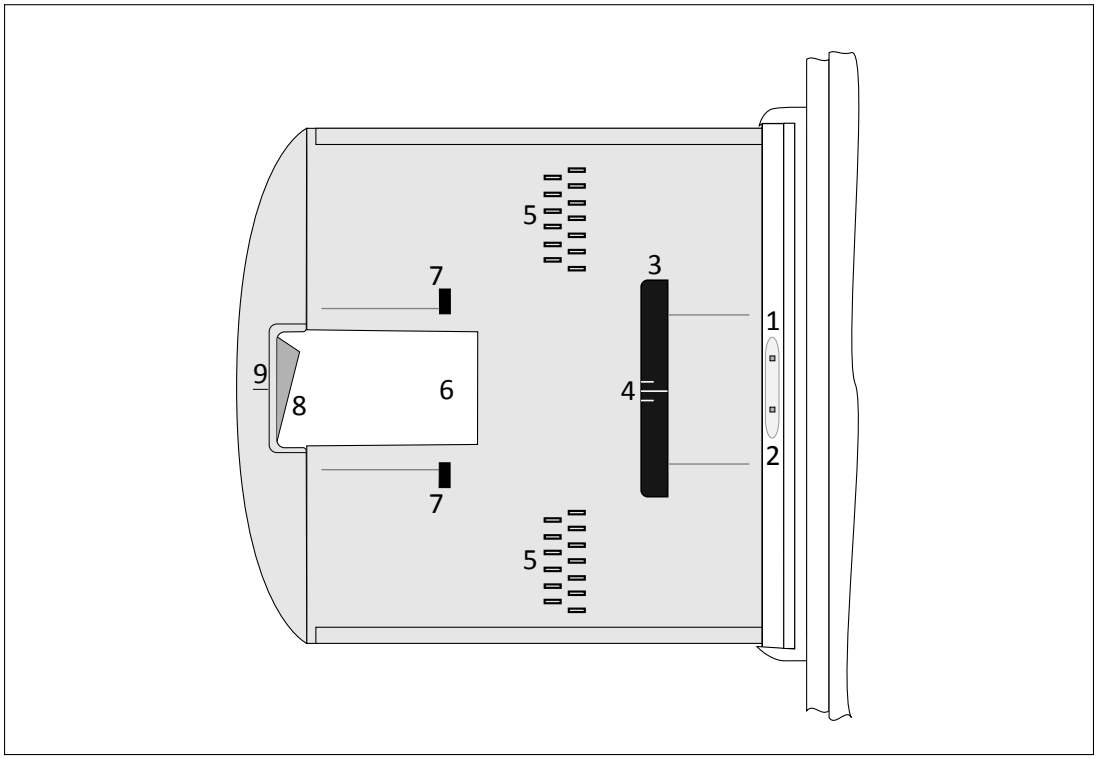
Detector Tray



No.	Meaning	
1	Green detector indicator lamp:	
	LED	Bucky unit detector status
	Off	No detector inserted
	On	Detector inserted correctly
	Blinking	Detector not inserted correctly
2	Yellow grid indicator lamp:	
	LED	Bucky unit grid status
	Off	No grid inserted
	On	Grid inserted correctly
	Blinking	Grid jam
3	Guiding bar for positioning and clamping the detector	
4	Centering lines for correct positioning	

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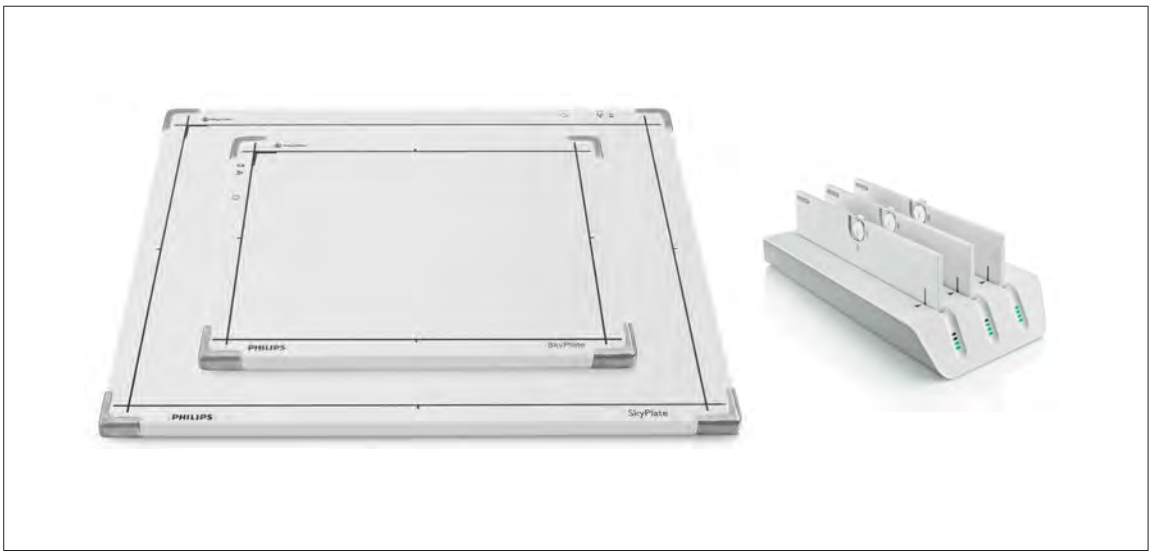
No.	Meaning
5	Pins for size sensing and holding the detector in place
6	Opening for grasping the detector
7	Clamping tabs
8	Lever for opening and closing the Bucky tray
9	Mark for centering the tube assembly to the detector

SkyPlate (Optional)

Overview



The SkyPlate is a cassette-sized wireless portable detector and comes with a battery charger.

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SkyPlate

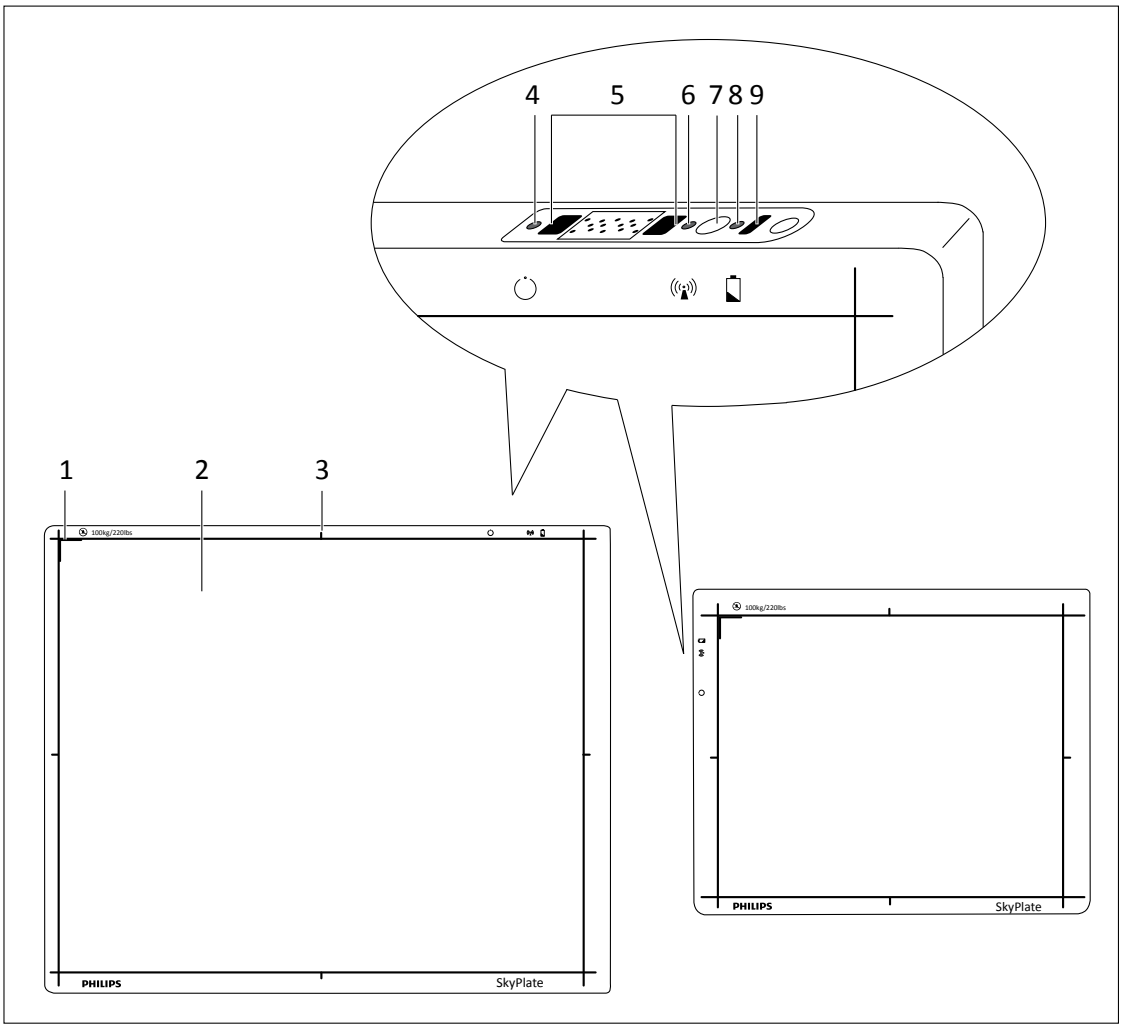

Fig. 17: Front view 35 cm × 43 cm (14 in × 17 in) format and 24 cm × 30 cm (10 in × 12 in) format

No.	Description
1	The corner marking indicates the top left of the detector.
2	The sensitive area delineates the effective imaging area of the detector.
3	Center marks for checking if the X-ray tube assembly is correctly centered on the detector.
4	LED detector status
5	Connector for connecting the cable.
6	LED WiFi status
7	Switch on/off

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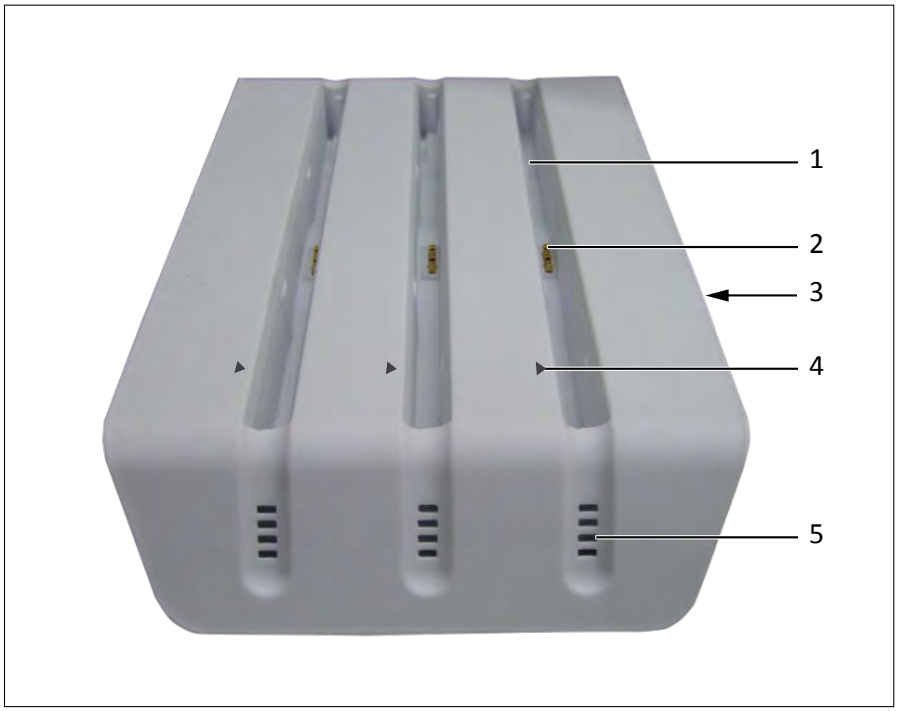
No.	Description
8	LED battery status
9	Infrared sensor for connecting the detector to the system

Battery Charger



No.	Description
1	Battery slot
2	Connector to battery
3	Power supply connection and LED
4	Mark for alignment with battery
5	Status LED

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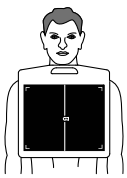
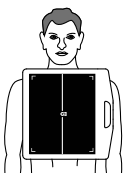
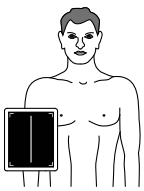
Grids

If necessary, you can attach the SkyPlate to an anti-scatter grid. There are three different types of grids available:

	Grid Orientation	Detector size
	Landscape	35 cm × 43 cm (14 in × 17 in)
	Portrait	35 cm × 43 cm (14 in × 17 in)
	Portrait	24 cm × 30 cm (10 in × 12 in)

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4 Switching the System On/Off

Switching On

NOTICE

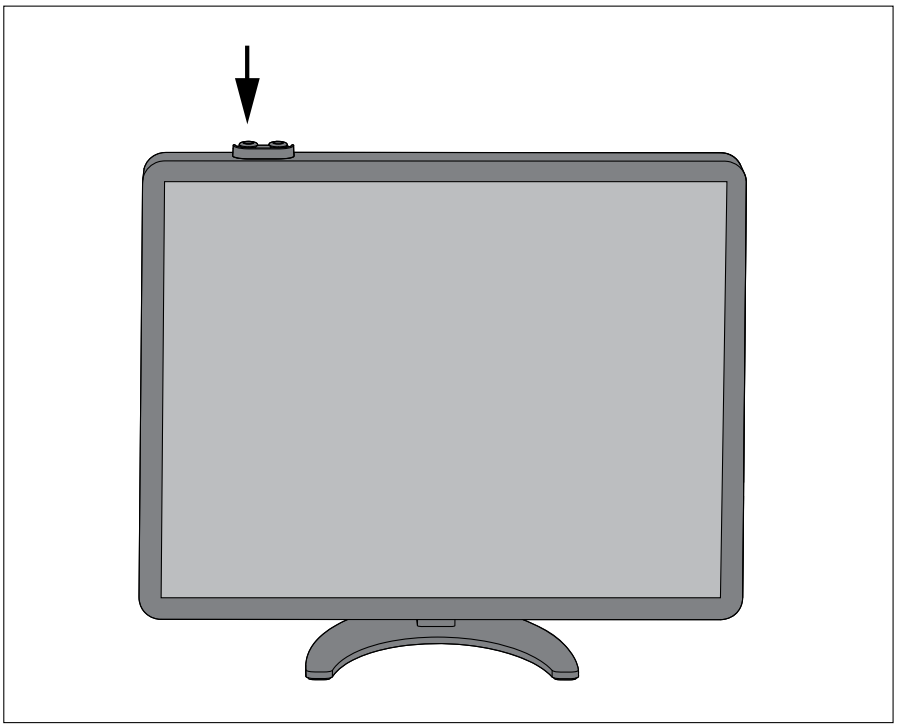
To ensure a proper startup of the system do not touch and do not move any components during the startup. Otherwise, the components may not start up properly and you may have to restart the system.

The startup is finished when the system shows the following:

- The Eleva Workspot displays the patient list.
- The display of the Eleva Tube Head displays the lock screen.

Philips recommends the following sequence:

► Press this monitor button for approx. 1 second.



⇨ The Eleva Workspot and all other components switch on.

► Log on to the decryption screen.

- Enter the user name.
- Enter the password.

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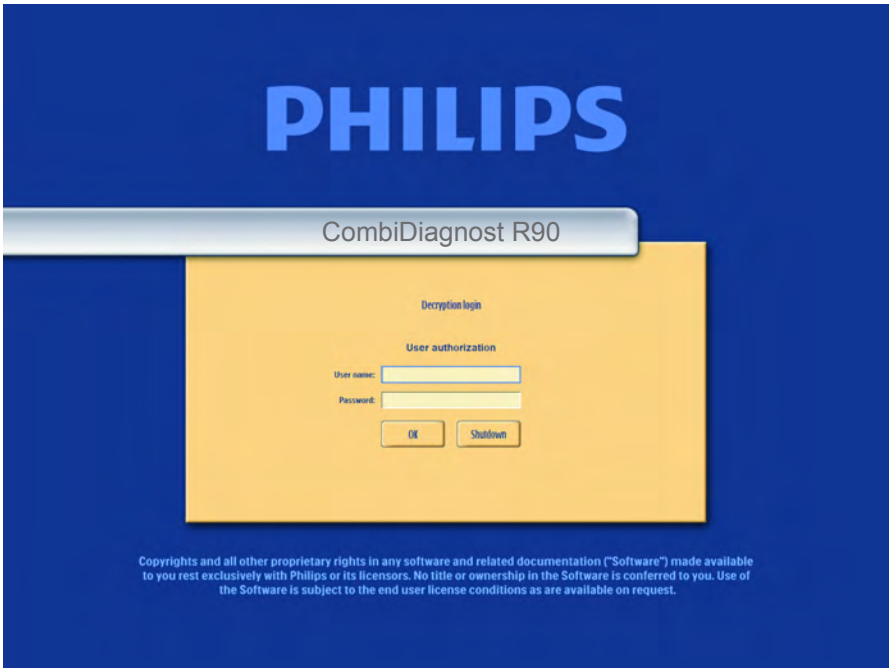
NOTICE

The default user name is **“user”**, the default password is **“user”**. The administrator and customer service can change the user accounts.



NOTICE

For systems without disk decryption

If your system is not decrypted, you will get the login screen instead of the decryption screen. The login screen is described in the following sections.

Logging In

► Log in to the program.

- Enter the user name.
- Enter the password.

NOTICE

The default user name is **“user”**, the default password is **“user”**. The administrator and customer service can change the user accounts.

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Switching Off

CAUTION

Risk of smell from generator

Do not switch on and off several times in quick succession.

NOTICE

The Eleva Workspot is designed for continuous operation. Therefore, it is only necessary to switch off all components in the event of prolonged stoppages.

NOTICE

The Eleva Workspot should be restarted once a day.

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► Press this monitor button to switch off the Eleva Workspot and all other components.

NOTICE

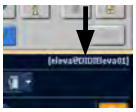
It can take several seconds for the system to shut down.

NOTICE

Do not keep the button pressed. If you keep the button pressed for more than 4 seconds, the system is aborted. This might harm the system.

Quick Logout

You can log out at any time.



► Click there.
The log-on screen appears.

Restarting the System

► Press this for 4 s.

⇨ The Eleva Workspot is restarted. All other components are not effected by the restart.

Aborting the System

▷ The system is not responding and cannot be shut down properly.

► Press this monitor button for approx. 4 s.

⇨ The Eleva Workspot and all other components shut down.

NOTICE

Abort the system only if necessary. It might harm the system.

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Emergency Access to the System

NOTICE

Unless the disk encryption has been specifically disabled, the disk encryption is enabled by default. On systems where the disk encryption is active, the emergency access is available only when the encrypted disk is unlocked.
You need to unlock the disk at each system startup (decryption login). The disk remains unlocked until shutdown and reboot.
Without entering the decryption password, not only access to the encrypted data is restricted, but the system cannot be used in its entirety.
If the system needs to operate in an emergency mode without decryption password, disk encryption needs to be disabled, even though not recommended for security and privacy reasons. When you have decided to disable disk encryption, this can be only reverted through a new system installation by the customer service.

NOTICE

Define an emergency access process in case the emergency's login is not available, because the encrypted disk is locked at system startup and an initial authentication is required to get the system operable.

The emergency mode permits access to the system without a user name and password. When you use the emergency access to the system, the system enforces restrictions to prevent access to all other (non-emergency) patient data.

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In the Emergency mode the following applies:

- Only the “Emergency” worklist is available; it contains only patient data with an emergency status.

  The picture shows a patient with emergency status (symbol in the left column).
- All patients added here are given emergency status.
- You cannot access other patients (for example from RIS).
- RIS query is not possible.

To cancel the emergency status of the patient data:

► Log in as a registered user.

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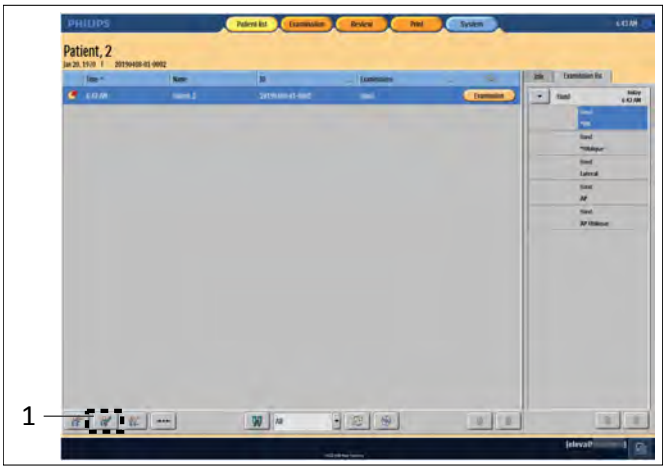
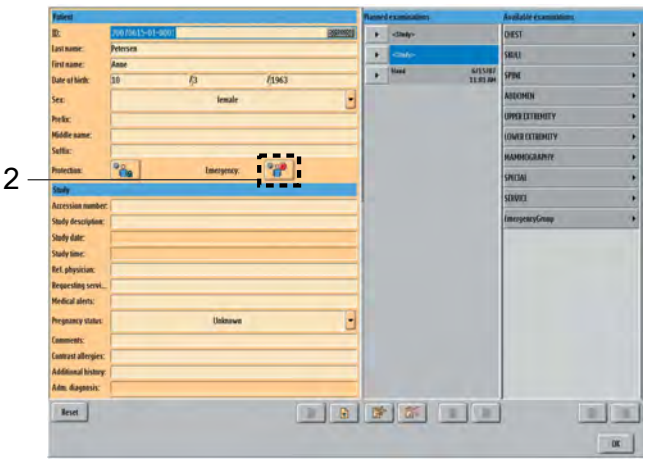
► Display the patient data (1).



► Turn off the emergency status (2).



Switching the UPS Off (Only for Service Reasons)

NOTICE

The UPS is installed by customer service. Under regular operation it shall not be switched off.

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5 Operation

Safety Awareness

WARNING

Do not start up the product unless you and all other users present have read, fully understood and know all the safety information and emergency procedures given in the Safety section of these Instructions for Use. Operation of the product without having known, read and understood ALL the safety information and procedures in the Safety section could lead to fatal or other serious personal injury. It could also lead to clinical misdiagnosis or clinical mistreatment.

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Workflow

On the Operator's Console	
Eleva Workspot	
RIS query or patient entry	
Select patient	
Select Examination section	
Select alternative view, if necessary	
Select registration device	
Set exposure data and/or fluoroscopy settings (zoom, frame speed)	
On the Geometry	
Position the patient	
Set geometry settings (SID, angulation table, height)	
Collimate	
Radiography	**Fluoroscopy**
Release X-ray with hand switch	Release fluoroscopy or spot exposures with foot switch
On the Operator's Console	
Eleva Workspot for radiography	**RF Viewer for fluoroscopy**
Check image	Check image
Post processing	Post processing
Confirm or reject image	Flag and export desired images
Complete examination on Eleva Workspot	

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System Components

Table

General Safety

WARNING

Risk of injury and equipment damage

Equipment movements operate with considerable force. Collisions can cause significant damage. When you perform a movement, you must always pay attention. Make sure that neither the patient nor the equipment is endangered.

WARNING

Risk of injury or equipment damage

After rough handling, check the image quality and general system functions, before you use the system with a patient. In case of any inconsistencies or kind of damages, do not use the system. Call customer service.

WARNING

Risk of injury

Do not use the table in case of any kind of damage after rough handling, for example, rough shock, earthquake. The detector may be damaged. Call customer service.

WARNING

Risk of injury

Make sure that the patient uses the hand grips mounted. While using the hand grips, the patient will not accidentally reach around the rails of the table. The patient will stand or lie more securely during the examination.

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WARNING

Always rescue a patient together with at least one other person in any of the following situations:

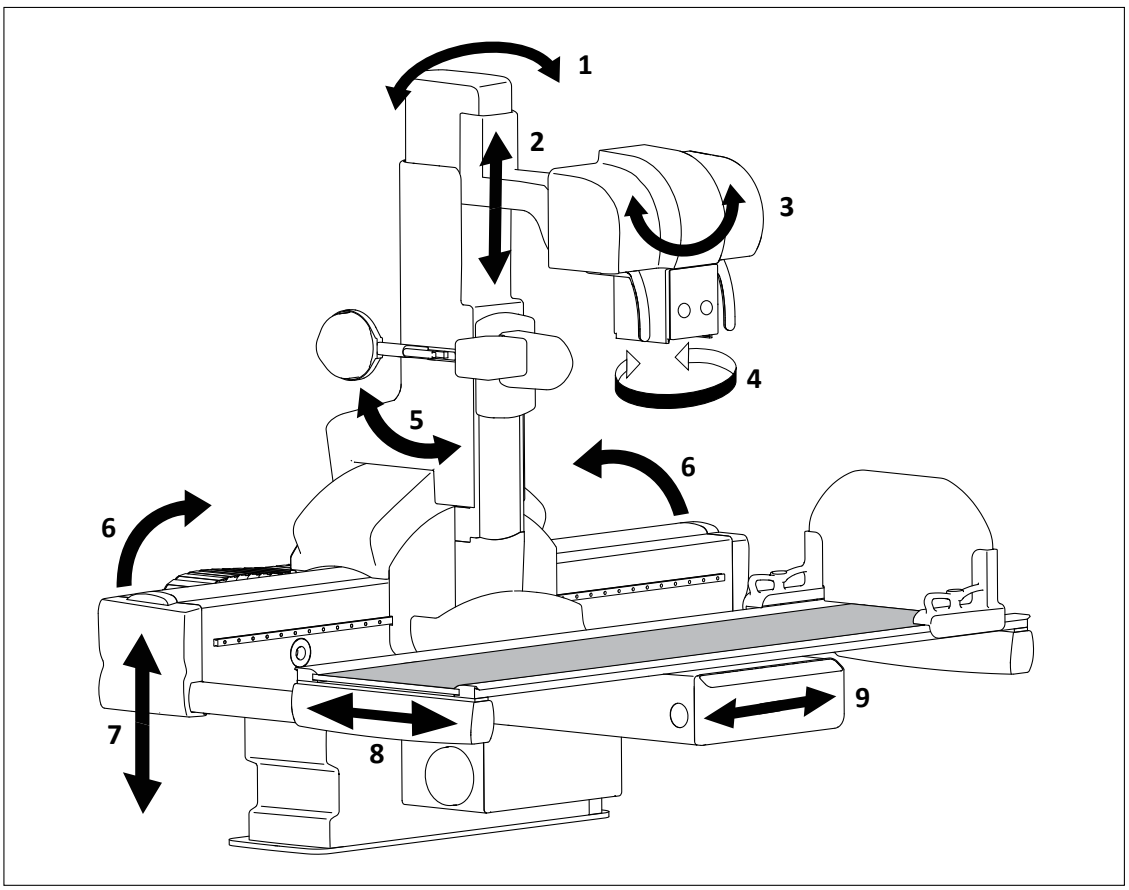
- **The table is in oblique tilting position.**
- **The patient is positioned on the table very high above the floor.**
- **The patient is in a medically critical condition.**

To help a patient who is positioned high above the floor, make sure that suitable facilities are at hand, for example, a ladder.

CAUTION

Patient may get caught when the table moves vertically.

Table Movements



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No.	Movement
1	Angling the column
2	Changing the Source to Image Distance (SID)
3	Rotating the X-ray tube assembly manually for free exposures
4	Rotating the collimator manually
5	Compressor (can only be done on the control console)
6	Tilting the table
7	Raising and lowering the table
8	Moving the table top transversely
9	Moving the column longitudinally

The movements at the table can be performed with the joystick on the control console and/or through the controls on the table control panel. The X-ray tube assembly and the collimator can only be moved manually.

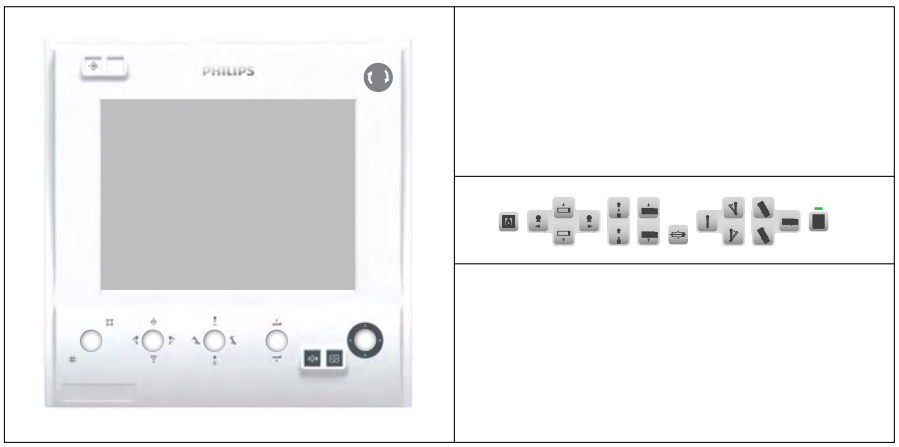

Fig. 18: Controls on the control console (left) and on the table control panel (right)

The size of the room may limit some of the movements. These space restrictions are set during installation.

Switching the Table Control Panel On/Off

WARNING

Risk of injury

During catheter examinations, switch off the table control panel functions to prevent any unintended table movements.

▷ When the table control panel is switched on, the button lights up green.

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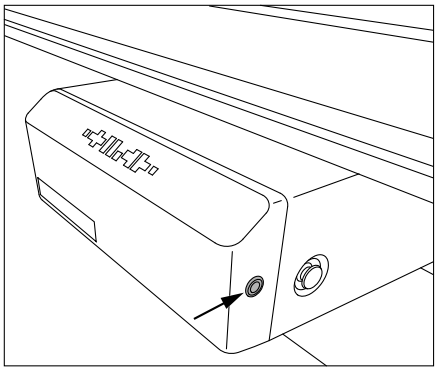
► Press the button to switch off the table control panel.



⇨ The light of the button is off.

► Press the button again to switch on the table control panel.

NOTICE

When you have switched off the table control panel, you can perform table movements by using the joysticks on the control console.

Transversal and Longitudinal Movements

NOTICE

Before performing any movements, make sure of the following:

- The patient is positioned correctly.
- The legs and arms of the patient do not extend over the boundaries of the table top.
- The patient uses the hand grip.

Make sure that no objects are in the movement range of the table.

The following movements at the table allow a broad coverage of the patient:

- The table top moves transversely.
- The column moves longitudinally.

You cannot move the column longitudinally when performing the following:

- Tilting the table.
- Raising or lowering the table.

The longitudinally movement is limited to a certain movement range to avoid collisions. The limitation refers to the tilt and height movement. A message appears accompanied by an audible signal.

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► Change the tilt of the table to remove the message.

Setting the Orientation of the Movements

The movements of the table top and the longitudinally movement of the column are controlled by the joystick on the control console.

Unlike other commands, the movements executed with the joystick, change depending on the orientation mode selected.

	Monitor orientation The arrows on the symbol show the direction the image on the monitor moves to. You can change the joystick behavior, if desired.
	Table orientation The arrows on the symbol show the direction the table top and the column moves to.

Monitor Orientation

When you select the monitor-orientation mode, the direction of the joystick corresponds to the movement of the image that is displayed on the screen.

► Press this.

Joystick Direction	Appears on Monitor
	The image moves to the right.
	The image moves to the left.
	The images moves down.
	The image moves up.

You can change the joystick behavior for the monitor-oriented mode on the Eleva Workspot.

► Go to **System/Settings**.

► Change the longitudinal and transversal movement as follows:

Image movement settings	What happens on the screen?
Same as joystick movement	The behavior is as if you move the image with your fingers on the touch screen.
Opposite to joystick movement	The image moves as described in the previous table.

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Table Orientation

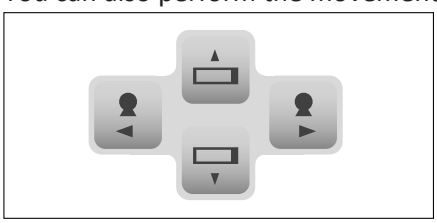
When you select the table-orientation mode, the movement of the joystick corresponds to the movement of the table top and column.

► Press this.

Joystick Direction	Movement of the Geometry
	The column moves to the left.
	The column moves to the right.
	The table top moves inwards.
	The table top moves outwards.

Movements Controlled by the Table Control Panel

You can also perform the movement using the button on the table control panel.



NOTICE

The movements controlled by the buttons on the table control panel are independent of the orientation mode that is set on the control console.

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Angling the Column

NOTICE

Before performing any movements, make sure of the following:

- The patient is positioned correctly.
- The legs and arms of the patient do not extend over the boundaries of the table top.
- The patient uses the hand grip.

Make sure that no objects are in the movement range of the table.

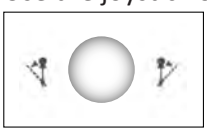
You can angle the column, for example, for oblique examinations.

You cannot angle the column when performing the following:

- Tilting the table.
- Raising or lowering the table.

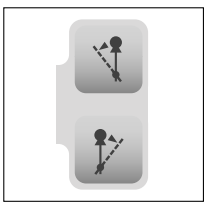
When the compressor is out of the parking position, the angling of the column is limited.

► Use the joystick on the control console.



Or

► Use the buttons on the table control panel.



⇨ When the column has reached +40° or -40°, the movement is stopped automatically.

Changing the Pivot Point

NOTICE

When the area of interest lies in a known focal plane or object plane, you can adjust the pivot point (fulcrum) to be at the same level. The structures in this plane stay in the center of the image.

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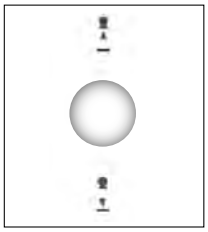
You can configure whether the option pivot point shows up on the control console display. The pivot point can be adjusted from table top level (0 mm) up to 350 mm (13.8 in) with 1 mm (0.04 in) steps.

Changing the SID

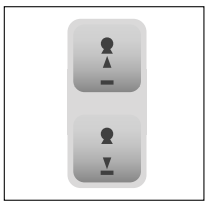
You can increase or decrease the source image distance (SID).

- Use the joystick on the control console.



Or

- Use the buttons on the table control panel.



If a grid is selected, the system moves a grid into the beam path. There are two grids available (f_0 = 120 cm and f_0 = 180 cm). The system selects the grid automatically depending on the SID.
When you increase the SID, the grid changes at 147 cm.
When you decrease the SID, the grid changes at 143 cm.

Tilting the Table

WARNING

Risk of injury

When a patient is lying on the table, perform the following before tilting the table:

- **Check that the necessary table accessories have been properly installed, for example, footrest, grips, shoulder supports, ankle clamps.**
- **Always attach the footrest.**
- **When tilting into a Trendelenburg position, use additional accessories that keep him from sliding down the table.**

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WARNING

For heavy patients (more than 135 kg [297 lb]) especially in combination with larger tilt angles of the table, use more than one means of fixation, for example, ankle clamps together with shoulder supports and hand grips.

CAUTION

Risk of equipment damage

Before tilting the table, remove all objects from the radius of movement. A collision of the table with an obstacle can damage the table.

NOTICE

Before performing any movements, make sure of the following:

- The patient is positioned correctly.
- The legs and arms of the patient do not extend over the boundaries of the table top.
- The patient uses the hand grip.

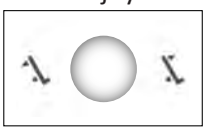
Make sure that no objects are in the movement range of the table.

The table can be tilted up to +90° and -90° to perform examinations in an upright position, in Trendelenburg position, or in all intermediate positions.

You cannot tilt the table when performing the following:

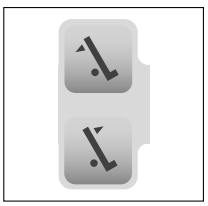
- Moving the table longitudinally.
- Angling the column.
- Raising or lowering the table.

► Use the joystick on the control console.



Or

► Use the buttons on the table control panel.



You can increase the speed of tilting:

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► Touch this on the control console display.

⇨ When you use the joystick for tilting the table, the tilting speed is fast.

► Touch the button again to change to normal speed.

The tilting speed slows down when the table approaches the limits (space restrictions) set during installation.

Raising and Lowering the Table

For patient convenience, you can raise or lower the table.

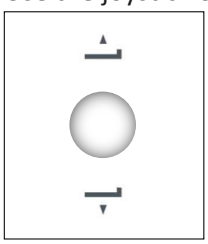
NOTICE

When the table is tilted and you raise or lower the table, the table moves back into a horizontal position before the vertical movements starts.

You cannot raise or lower the table when performing the following:

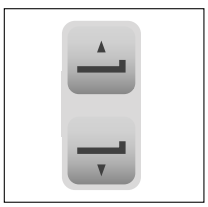
- Moving the column longitudinally.
- Tilting the table
- Angling the column.

► Use the joystick on the control console.



Or

► Use the buttons on the table control panel.



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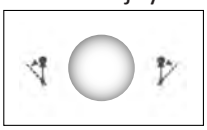
Centering the Column, Table, and Table Top

Centering the Column

On the Control Console

► Touch this.

► Move the joystick to the desired direction.



⇨ When you move the column towards the center, the movement is stopped in the center.

► Release the joystick.

► If you want to continue the movement, move the joystick to the desired direction again.

On the Table Control Panel

► Press this.

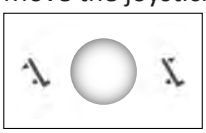
⇨ The column angles to the center position (0°).

Tilting the Table to the Horizontal Position

On the Control Console

► Touch this.

► Move the joystick to the desired direction.



⇨ When you move the table towards the horizontal position, the movement is stopped in the center (horizontal position).

► Release the joystick.

► If you want to continue the movement, move the joystick to the desired direction again.

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On the Table Control Panel

► Press this.

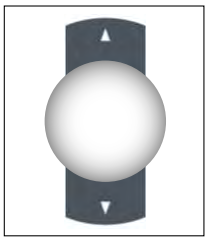
⇨ The table tilts to the horizontal position (0°).

Centering the Table Top

On the Control Console

► Touch this.

► Move the joystick to the desired direction.



⇨ When you move the table top towards the center, the movement is stopped in the center.

► Release the joystick.

► If you want to continue the movement, move the joystick to the desired direction again.

On the Table Control Panel

► Press this.

⇨ The table top moves to the center position.

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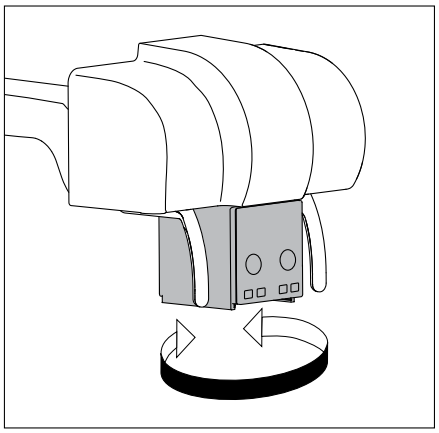
Collimator

Rotating the Collimator



For radiography, you can rotate the collimator ±45° around its vertical axis.

For fluoroscopy, the collimator must be in zero position. Otherwise, the system will not give a ready light for releasing X-rays.
Do not rotate the collimator during fluoroscopy. The exposed area may extend beyond the active area of the detector.

Using the Light-Field Indicator

The light-field indicator is a radiation-field display. The light switches on automatically when you open or close the collimation using the buttons on the collimator.

WARNING

Risk of overheating

Do not use the light-field indicator more than five times in a row. The collimator may overheat. After that, the collimator has to cool down for about 10 min.

You can switch on the light manually:

► Press the button on the control console or on the table control panel.

⇨ The light switches off after 45 seconds.

⇨ You can switch off the light manually by pressing the button again.

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Automatic Collimation

The collimator sets the size of collimation automatically according to the selected examination. At any time, you can change the size of collimation manually.

The automatic collimation behavior for radiography and fluoroscopy is different:

Radiography

- ► Select a view of the examination.

⇨ The collimator is automatically set to the preset value for this view.

- ► Press this button if you want to use the last manually selected field size.
- ► Press the button again.

⇨ The automatic preset value is set.

When you set the collimation manually and select the desired view afterwards, the collimation that was set manually remains.

The collimator changes back to automatic collimation, when you perform one of the following:

- Release an X-ray and select the next view.
- Press the active view (background is blue) on the Eleva Workspot for a longer time.

Fluoroscopy and Spot Images

- ► Select a view of the examination.

⇨ The collimator settings remain unchanged.

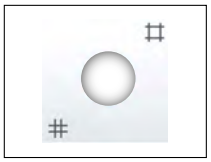
- ► Press this button if you want to use the preset value for this view.
- ► Press the button again.

⇨ The field size is set to the detector size.

Manual Collimation

You can adjust the size of collimation manually according to your needs.

- ► Use the joystick on the control console.



Or

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► Use the buttons on the collimator.

Inserting an Accessory

CAUTION

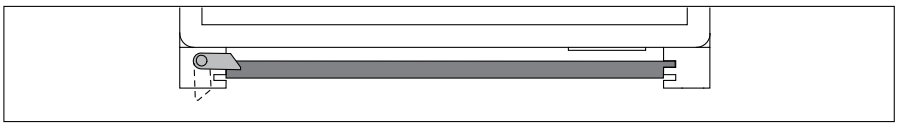
Maximum load of the accessory rails is 3 kg (6.6 lb) (dynamic) and 7 kg (15.4 lb) (static).

CAUTION

Accessories must have a width of 170 mm ±0.5 mm. Make sure that the accessory fits into the slot. Otherwise the accessory could fall down.

► Insert the accessory into either of the collimator rails.

► Turn the lever into horizontal position to lock the accessory.



Removing an Accessory

► Turn the lever into vertical position to unlock the accessory.

► Pull out the accessory.

Rotating the X-Ray Tube Assembly for Free Exposures

You can rotate the X-ray tube assembly manually to perform X-ray examinations on free cassettes or free detectors, for example, the SkyPlate.

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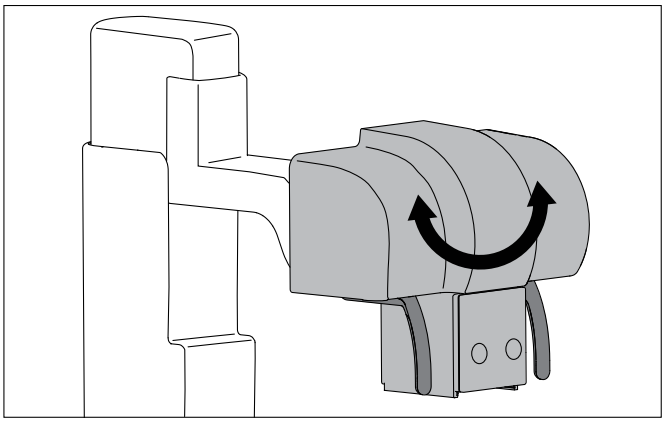
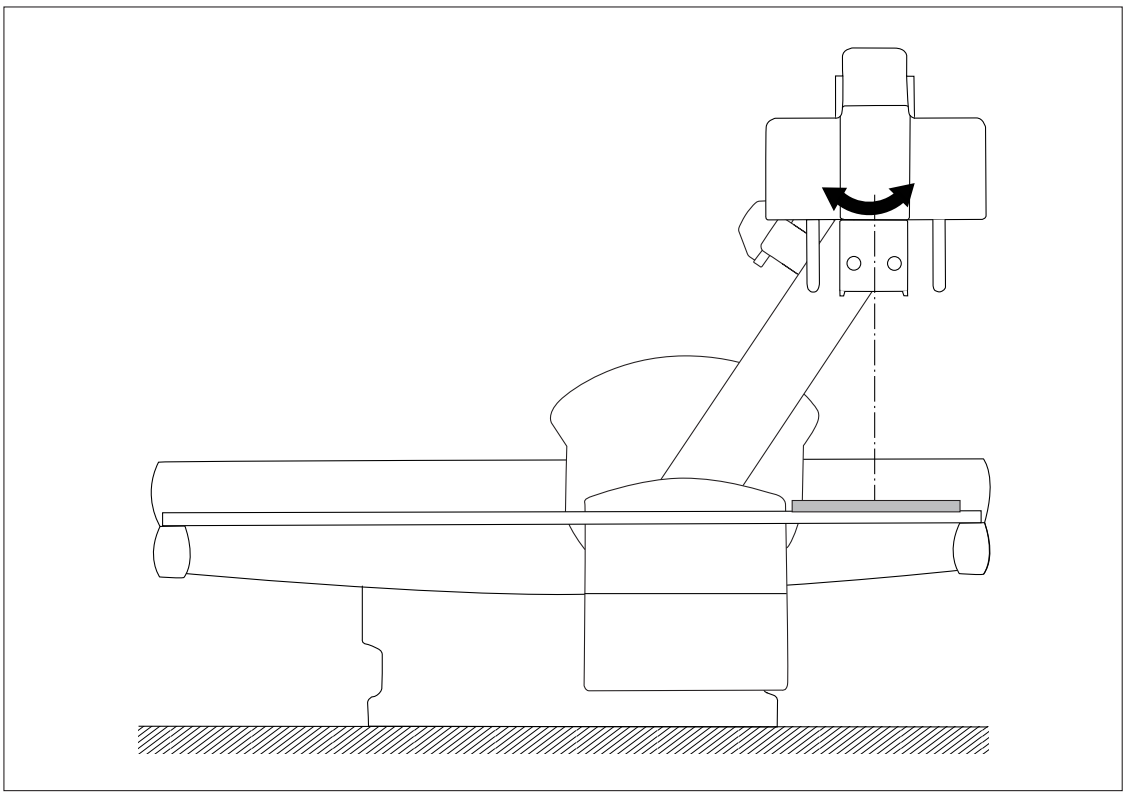


- ► Push the hand grips and rotate the X-ray tube assembly to a default position.
- ► Release the hand grips.
- ⇨ The X-ray tube assembly locks into place.

The default positions are +40°, +50°, +90°, +180°, 0° , -40°, -50°, and -90°.



NOTICE

When you want to perform fluoroscopy or take images using the table, the X-ray tube assembly has to be in zero position.

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Using the Compressor

WARNING

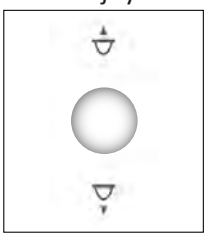
Risk of collision

If the leg support is used, the compressor must be in parking position.

The compressor is applied for examinations of the digestive system.

The cone compresses the body of the patient and stops automatically when the compression force that is set on the control console is reached.

► Use the joystick on the control console.



► Pull the joystick down.

⇨ As soon as the compressor leaves its parking position, the compression force can be set on the control console.

⇨ The compression force is set to 5 kg (11.1 lb) by default.

► Change the compression force, if necessary.

► Pull the joystick down again.

⇨ The compressor cone moves into the X-ray beam path and then down towards the patient.

⇨ The cone compresses the body of the patient and stops automatically when the compression force that is set on the control console is reached.

► To decompress, push the joystick up.

⇨ The cone of the compressor moves up and then out of the beam path.

► To return the compressor into its parking position, keep pushing the joystick up.

Moving the Table Vertically and the Column Longitudinally While Using the Compressor

▷ The patient is compressed.

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► Use the joystick to perform the movements until an audible sound occurs.

⇨ The compressor raises slightly until the patient is free.

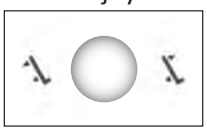
► Move the table to the desired position.

► When the desired movement has been completed, pull the joystick down to perform the compression again

Angling the Column While Using the Compressor

▷ The patient is compressed.

► Use the joystick to angle the column until an audible sound occurs.



⇨ The compressor raises slightly until the patient is free.

► Once the compressor stops moving, release the joystick.

► Use the joystick again to angle the column within a range of ±15°.

If you want to angle the column more than ±15°, you have to move the compressor into the parking position first.

► Angle the column to the desired position.

► Pull the joystick down to perform the compression again.

Releasing the Compression Manually

WARNING

Risk of injury

When system movement is not possible and the patient is trapped between table and compressor, remove the compressor manually.

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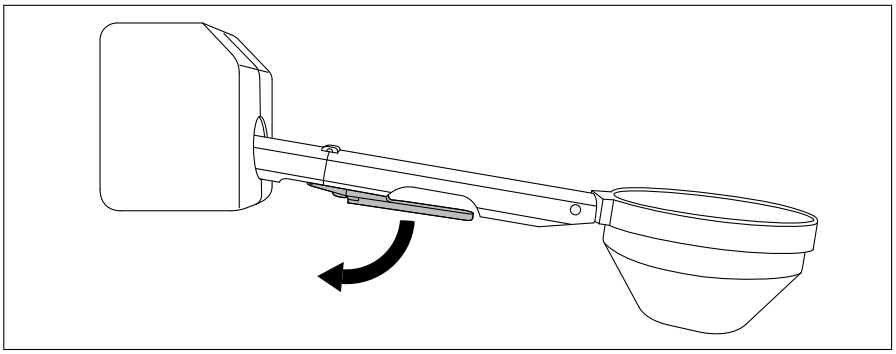
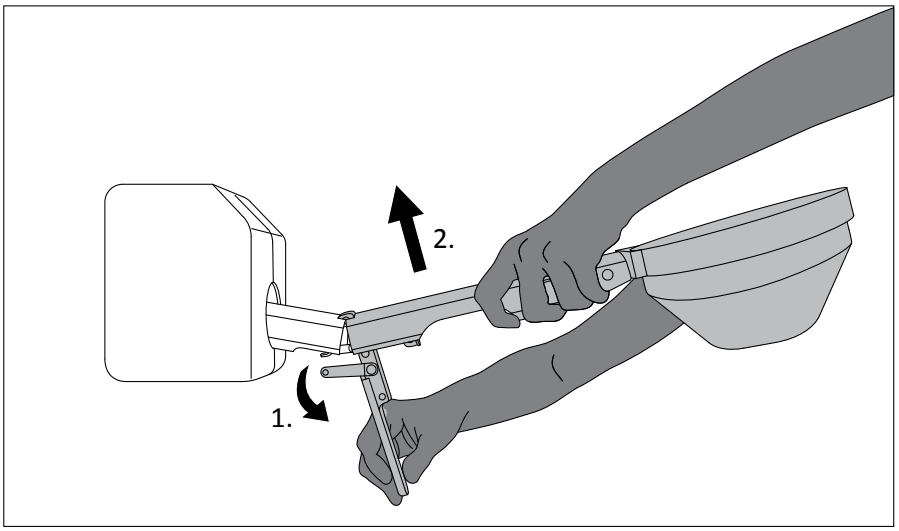
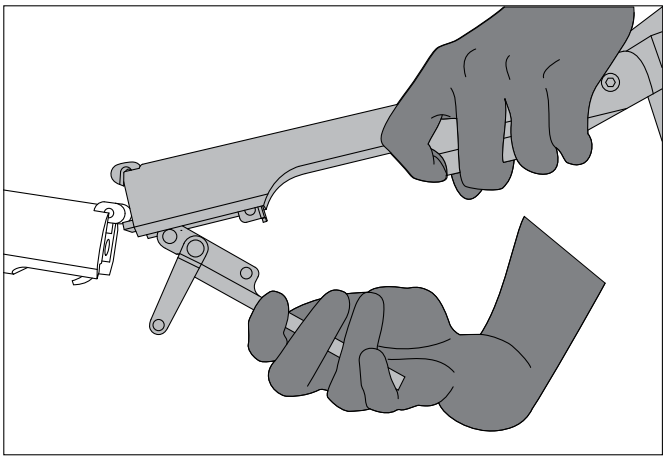
► Pull the lever.



► Unhook the compressor (1) and lift it (2).



► To mount the compressor again, hook the compressor onto its mounting.



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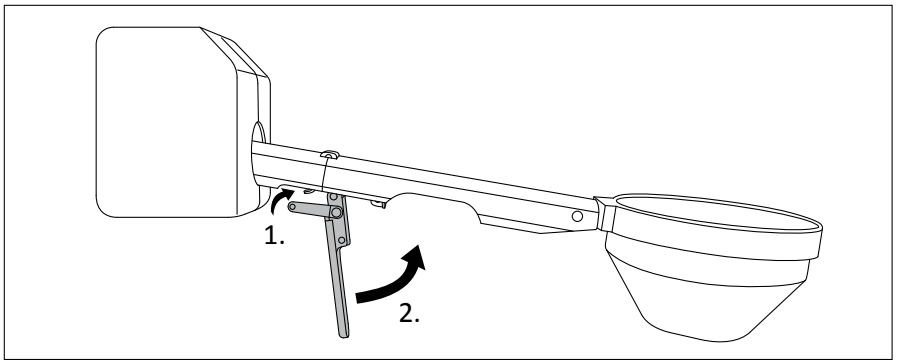
► Move the latch over the hook (1) and lock the lever (2).



Selecting the Grid

The table includes two types of grids with different SIDs that are selected automatically according to the chosen SID. A grid inserted or not is based on the programmed exposure parameters.

You can move the grid in or out of the beam path manually. You can either use the button on the control console or on the table control panel.

► Touch this on the control console.

Or

► Press the button on the table control panel.

⇨ The grid moves into the beam path.

⇨ The LED lights up green.

► Touch this on the control console again.

Or

► Press the button on the table control panel again.

⇨ The grid moves out of the beam path.

NOTICE

During the grid movement, a message on the screen indicates this.

Room Limits

The system includes an anti-collision system controlled by software. During installation, the service technician sets the limits according to the dimensions of the room.

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When parts of the table detect the room limits, the movement is stopped to prevent a collision. A message appears that the limit is reached accompanied by an audible signal. Movements are possible away from the collision point only.

Control Console

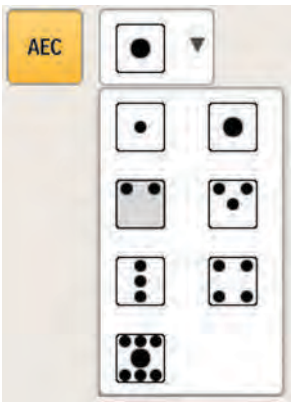
How to Use the Control Console

Operating the Buttons

The buttons show the following status:

		The button is not available until certain actions have been performed.
		The function of the button is not active.
		The function of the button is active.

Some buttons have to be active to show the corresponding drop-down menu.



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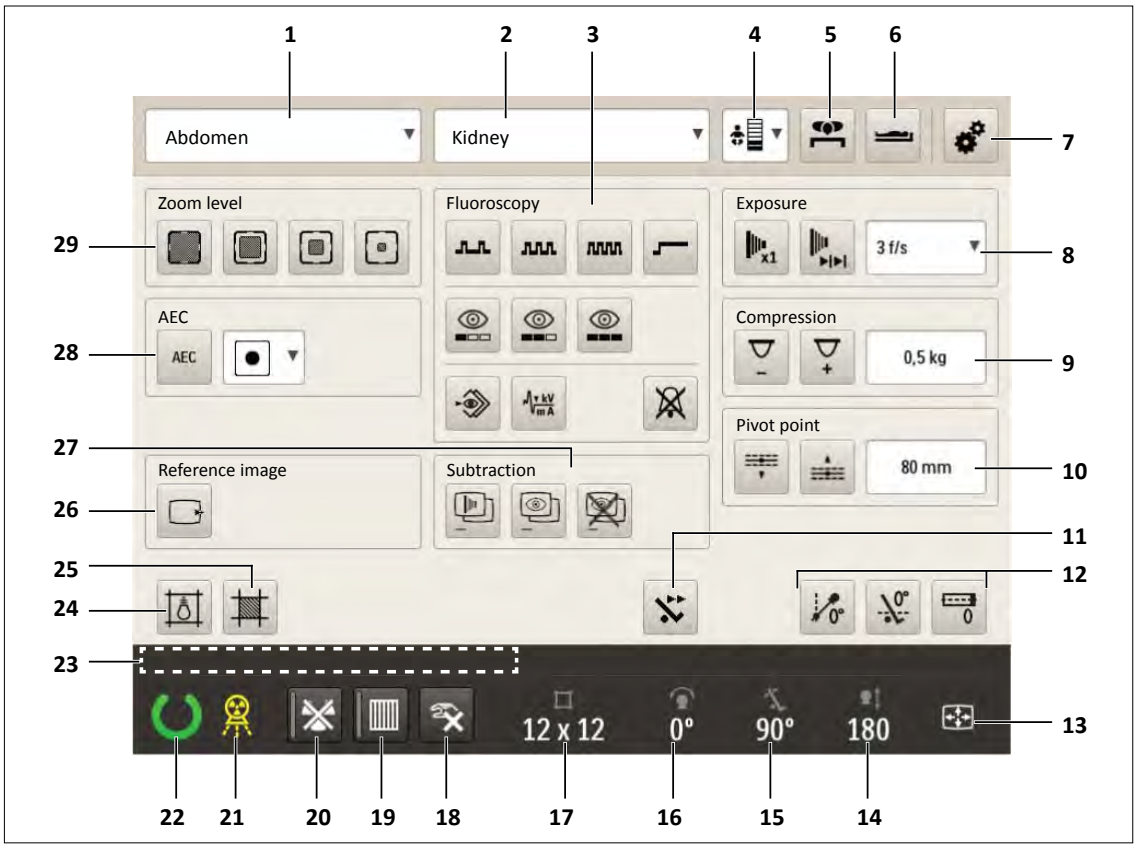
Overview



No	Symbol	Meaning
1		Display the examination name selected on Eleva Workspot
2		Display the view name selected on Eleva Workspot
3		Select fluoroscopy modes:
		Pulsed fluoroscopy, slow
		Pulsed fluoroscopy, medium
		Pulsed fluoroscopy, fast
		Continuous fluoroscopy

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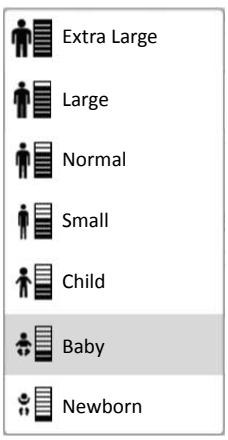
No	Symbol	Meaning
		Fluoroscopy flavor: Reduced dose
		Fluoroscopy flavor: Normal dose
		Fluoroscopy flavor: High quality
		Dynamic fluoroscopy grab (auto grab)
		kV/mA lock-in
		Turn off fluoroscopy buzzer
4		Change the patient type. You can select a different patient type from the drop-down menu: 
5		Select patient orientation: Prone position (flip image horizontally)
6		Select patient orientation: Head at foot end (rotate image 180°)
7		Open control console setup page to change settings

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No	Symbol	Meaning
8		Set exposure type:
		Select single spot exposure
		Select series exposure When series exposure is selected, you can choose different frames per second from the drop-down menu up to 8/s. Example:  The frame rate depends on zoom, exposure time (ms) and programmed parameters. You may have to scroll down the menu.
9		Set the compression force. This is only possible when the compressor is not in parking position.
		Decrease the compression force
		Increase the compression force
10		Set the pivot point: This is only shown when set in the control console settings.
		Increase the distance table top to pivot point
		Decrease the distance table top to pivot point
11		Select fast table tilt speed
12		Activate centering the column, table, and table top
		Center the column
		Tilt the table to the horizontal position

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No	Symbol	Meaning
		Center the table top
13		Display movement orientation:
		Monitor-movement orientation
		Table-movement orientation
14		Display set SID
15		Display table tilting
16		Display column angulation
17		Display collimation size
18		Select manual reset
19		Select grid in/out
20		Disable X-ray
21		Lights up during exposure
22		Display “ready for exposure” or
		Display “not ready for exposure”

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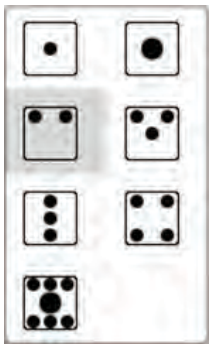
No	Symbol	Meaning
23		System messages are displayed here.
24		Switch the light-field indicator on
25		Reset the collimation to the preset size
26		Send image to reference monitor
27		Subtraction:
		Select image subtraction
		Select fluoroscopy subtraction
		Create a new mask
28		Select AEC on When AEC is selected, you can choose between different AEC measure fields from the drop-down menu. 
29		Set the detector field size:
		Select 43 cm x 43 cm (17 in x 17 in)
		Select 30 cm x 30 cm (11.8 in x 11.8 in)

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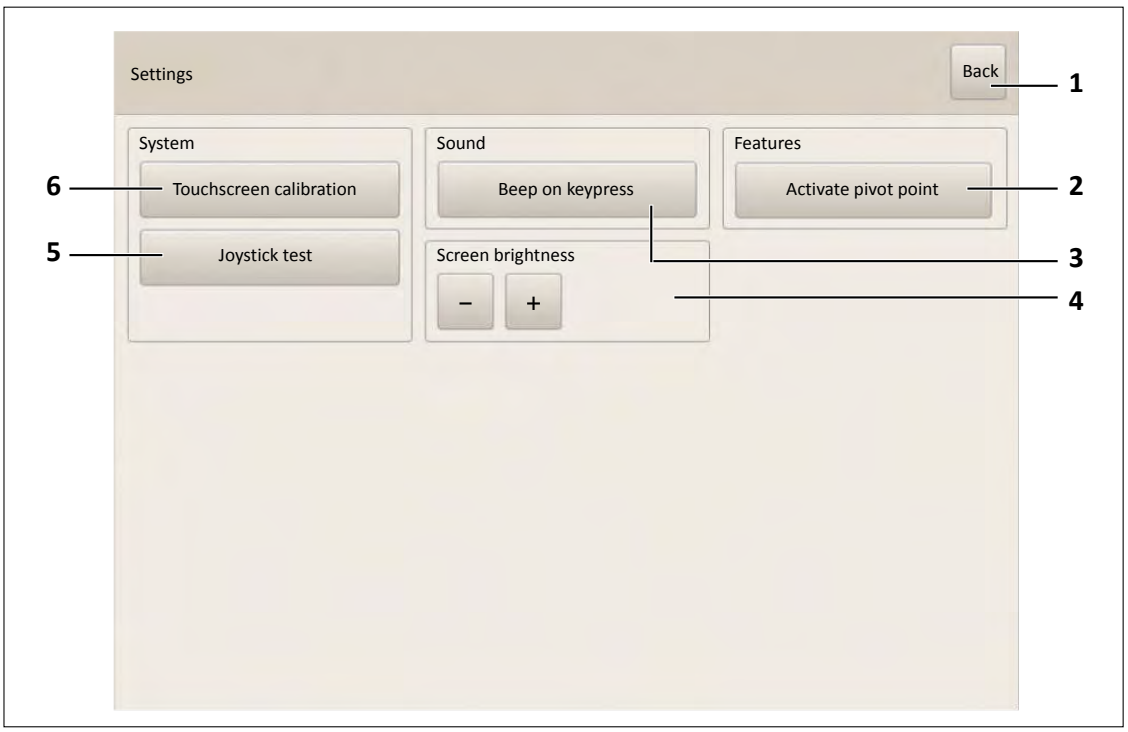
No	Symbol	Meaning
		Select 20 cm x 20 cm (7.9 in x 7.9 in)
		Select 15 cm x 15 cm (5.9 in x 5.9 in)

Changing the Settings



No.	Meaning
1	Go back to the main menu
2	Activate the pivot point feature on the main menu
3	Activate sound-on for key press
4	Set the screen brightness
5	Start the joystick test
6	Start the touch screen calibration

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Ceiling Suspension CSM3 (Optional)

Safety Instructions

WARNING

Risk of Collision

Ensure that there are no persons or objects in the range of the tube assembly movement.

WARNING

Only use accessories for this unit that are approved by Philips for such use.

WARNING

Risk of system damage

Ensure that the patient does not use the control grip as a handle.

WARNING

Risk of falling parts

When tilting the tube assembly, make sure that the locking device for the accessory rails is closed.

CAUTION

- **Patient may get caught when the ceiling suspension is positioned beside the table top.**
- **Patient may get caught between the table top and the ceiling suspension when the ceiling suspension moves downwards.**

CAUTION

Risk of injury

When you move the detector of the wall stand upwards, make sure that the patient does not get trapped between the table and the detector.

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CAUTION

Risk of injury

When you tilt the detector of the wall stand, make sure that the patient does not get trapped between the ceiling suspension and the detector.

NOTICE

To avoid potential harm or dismay, inform the patient beforehand about automatic, motorized movement of the ceiling suspension.

NOTICE

During any tube assembly movement, take care not to hit the patient accidentally.

NOTICE

In case of a collision, the brakes in the ceiling suspension engage and are then immediately released, so that you can manually move the tube assembly out of the collision zone. Depending on the severity of the collision, check the system components involved for visible defects before you continue.

To continue operation, the system message at the Eleva Workspot indicating that a collision has been detected has to be confirmed.

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Moving the Tube Assembly with the Control Handle Buttons

No.	Color	Function
1	Blue	Move the tube assembly transversely. LED lights up when locked in detent position.
2	Green	Move the tube assembly longitudinally. LED lights up when locked in detent position.
3	White	Rotate the tube assembly round the stand axis (electrical enable). LED lights up when locked in detent position.
4	Yellow	Raise or lower the tube assembly.
5	White	Angulate the tube assembly round its transverse axis. LED lights up when locked in detent position.
6	none	Move the tube assembly freely: longitudinally, transversely and vertically.

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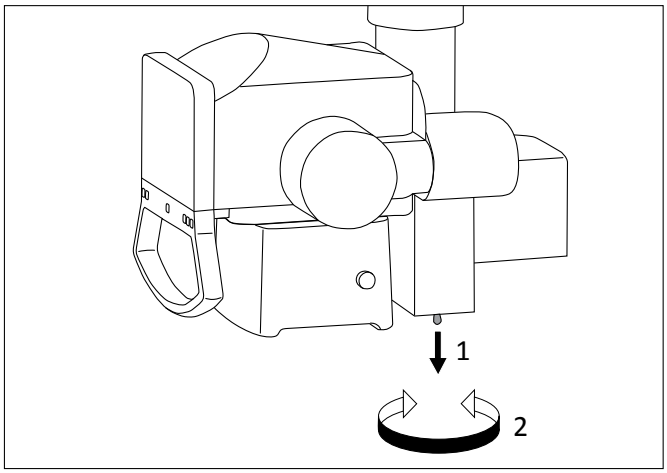
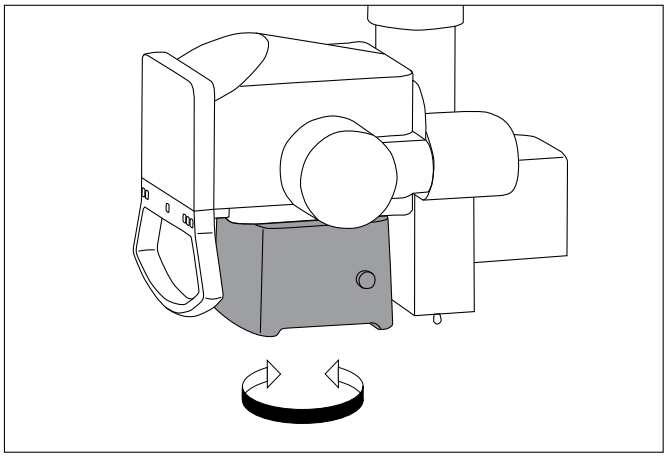
To rotate the tube assembly round the stand axis manually (white): Pull the knob at the telescoping column (1), then rotate (2).



Rotate the collimator.



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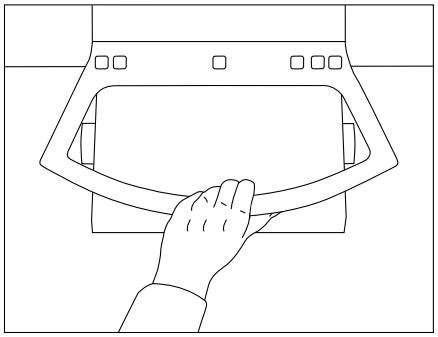
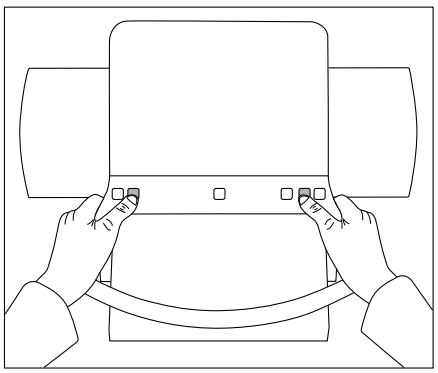
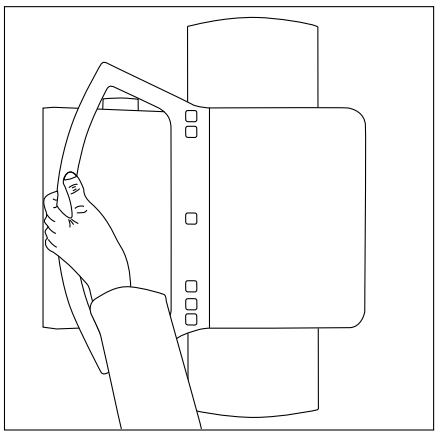
Easy Positioning of the Tube Assembly with the Control Handle Buttons



The touch sensor to enable longitudinal, transverse and vertical movement is positioned at the lowest point on the control handle. The sensor area is highlighted by a hatched surface.



For longitudinal and transverse movement, you can grip and move the tube assembly with two hands. You can enable movement with one finger, without having to take your hand off the control handle.



If you want to move the tube assembly a longer distance (for example, when changing from the table to the wall stand), you should first rotate the tube assembly and lower it to elbow height. Then you can move it conveniently with one hand.

Tracking

About Tracking

When the tracking function is switched on, the tube assembly follows the detector's movement to maintain

- The required SID (see the first image below)
  or
- The required height of the tube assembly (see the second image below).

You can use tracking with the wall stand, free cassette, and free detector.

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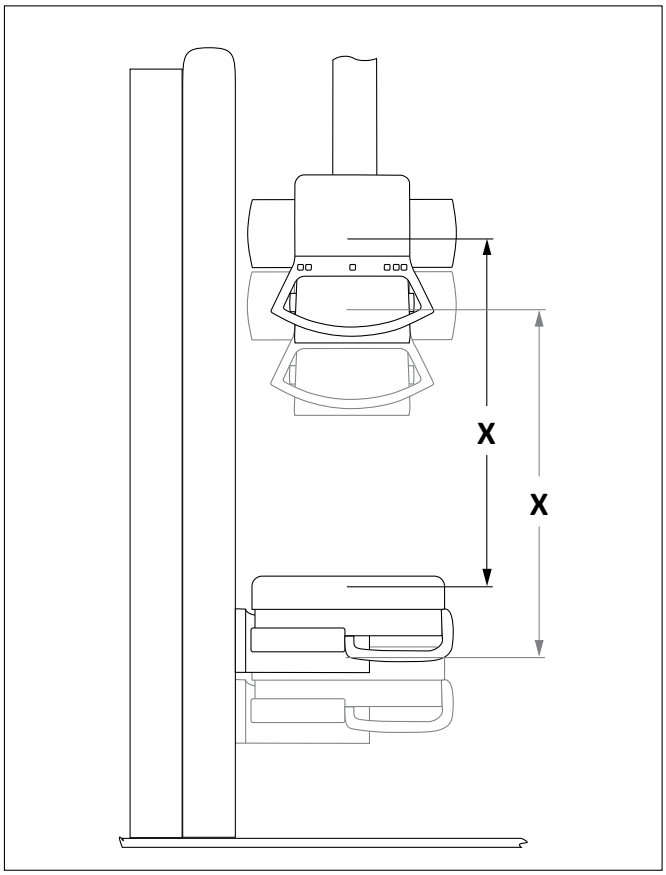

Fig. 19: Tracking on the wall stand with tilted Bucky unit. The SID (**X**) remains constant.

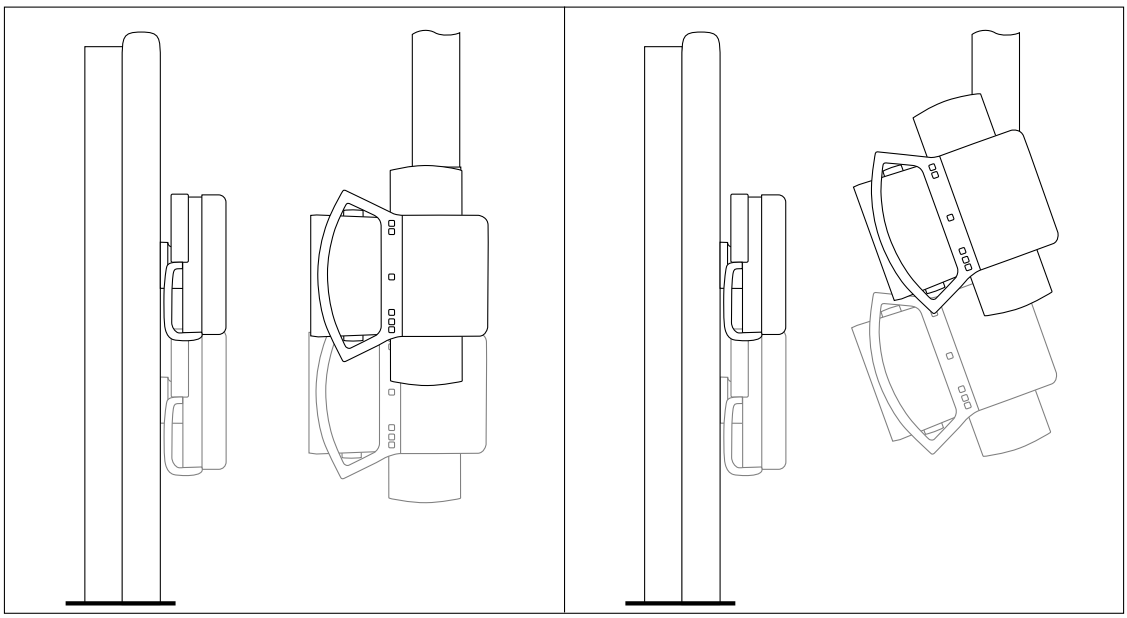

Fig. 20: Tracking on the wall stand with horizontal or oblique radiation beam axis

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Preconditions for Tracking

When tracking is activated, the system synchronizes the height of the tube assembly within the tracking band. This tracking band is a predefined range where the system will track. The service engineer can configure the tracking band individually.

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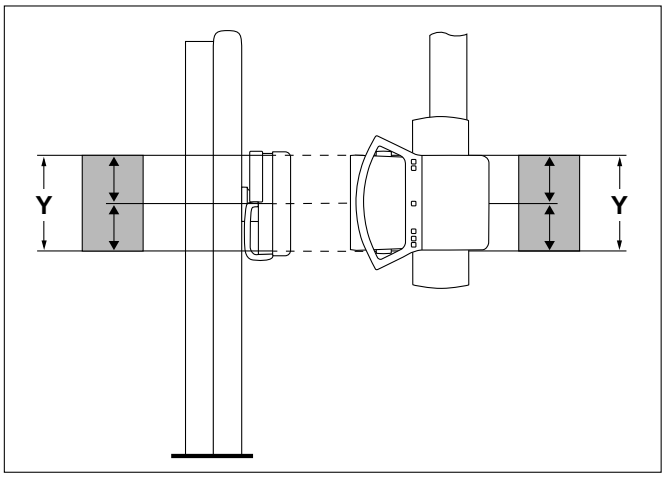
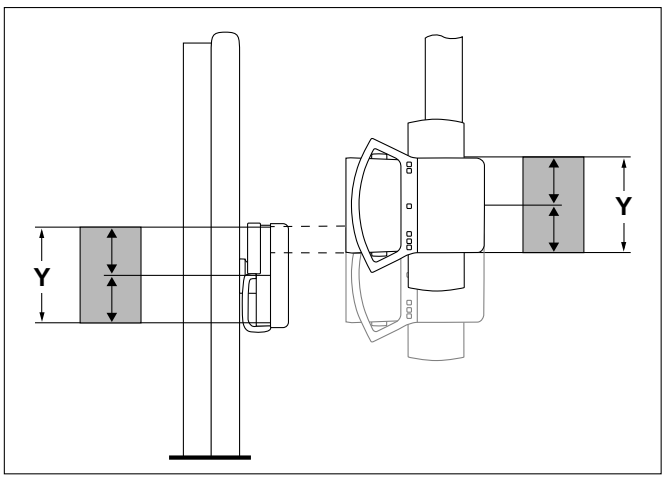
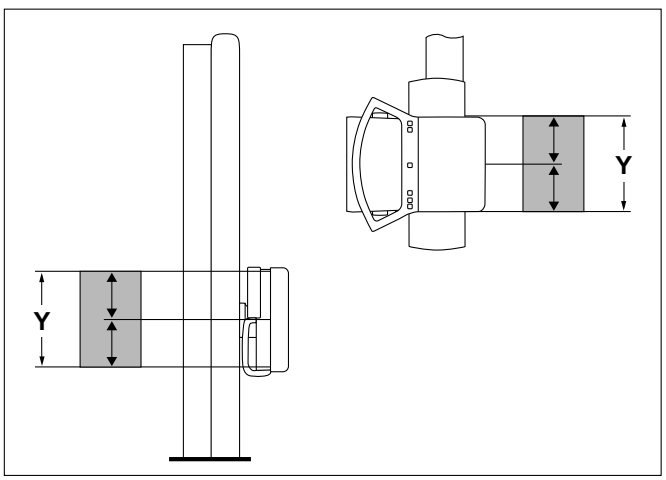
Tracking band	Tracking status	Description
	On	When you move the detector, the X-ray tube assembly aligns automatically with the detector.
	On	When you move the detector, the X-ray tube assembly follows automatically.
	On/Standby	The X-ray tube assembly moves automatically to align with the detector, when you perform one of the following: • Move the geometry into the tracking band. • Push the tracking button twice.

Tab. 1: Examples of tracking band

The tracking function works only under the following conditions:

- The system must be equipped with automatic collimation.

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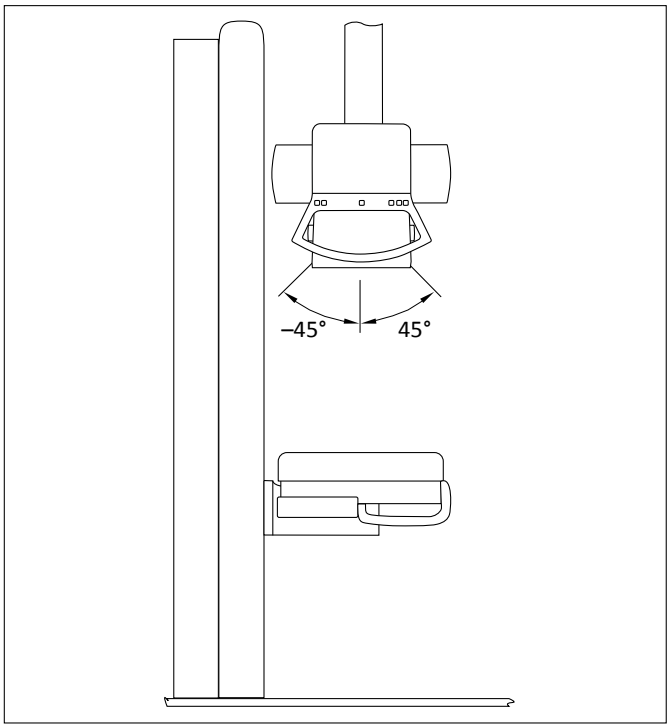
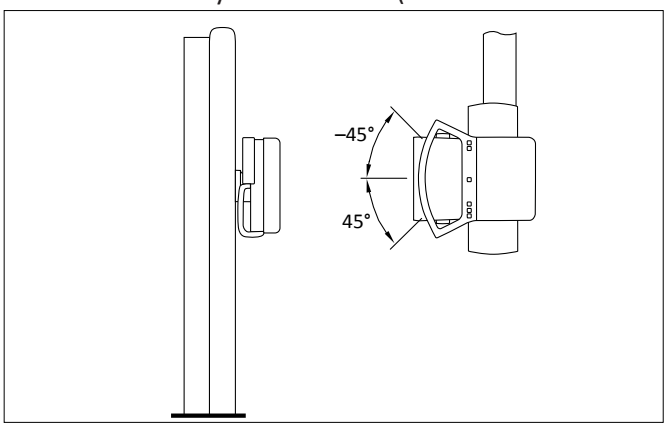
- The tube assembly is at 0° ±45° (when the wall stand is in the horizontal position).



- The tube assembly is at 90° ±45° (when the wall stand is in the vertical position).



Switching Tracking On/Off

► To switch tracking on/off, press one of these buttons:

 On the control grip.

 On the control panel and remote control of the wall stand (when the **Wall stand** registration device is active. Otherwise, press once to select the wall stand and press a second time to activate tracking).

⇨ The LED is lit when tracking is on.

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Tracking With Free Cassette or Free Detector

Tracking with free cassette or free detector works differently than with fixed detectors. First you measure the distance to the cassette or detector manually. Then the tracking function moves the tube assembly automatically to the required SID or to the required height of the tube assembly.

▷ Tracking is on.

▷ The tube assembly is at 0° ±45° (when the free cassette or free detector is in the horizontal position).

► Select the **Free cassette** or **Free detector** registration device on the control grip or on the Eleva Workspot.

► The display on the control grip informs you to measure the SID manually.

► Pull the tape from the collimator to the cassette or detector and hold it tightly until you hear an audible beep.

⇨ The tube assembly moves automatically to the required SID.

Notes on Tracking

Tracking is protected against collisions. If the tube assembly meets an obstacle, it stops when a certain force is exceeded.

Tracking Status	LED Light	Location of Components	Description
Deactivated	Off	Tube assembly is inside or outside the tracking band.	When you switch tracking on, the tube assembly moves to the required SID or to the required height of the tube assembly as long as the geometry is able to reach the tracking position.
On	On	All components are inside the tracking band.	The tube assembly automatically moves to the required SID.
On	On	The tube assembly was moved manually inside the tracking band.	The tube assembly automatically moves back to the required SID.
On/Standby	On	The tube assembly was moved manually outside of the tracking band or tilt of the tube assembly is not correct.	Tracking is on standby. The tube assembly does not automatically move to the required SID. Messages on the control grip indicate the problem. Push the tracking button twice or manually move the geometry into the tracking band.
On/impossible	On	The components are not in the required positions or there is another problem.	Tracking is impossible. Messages on the control grip indicate the problem.

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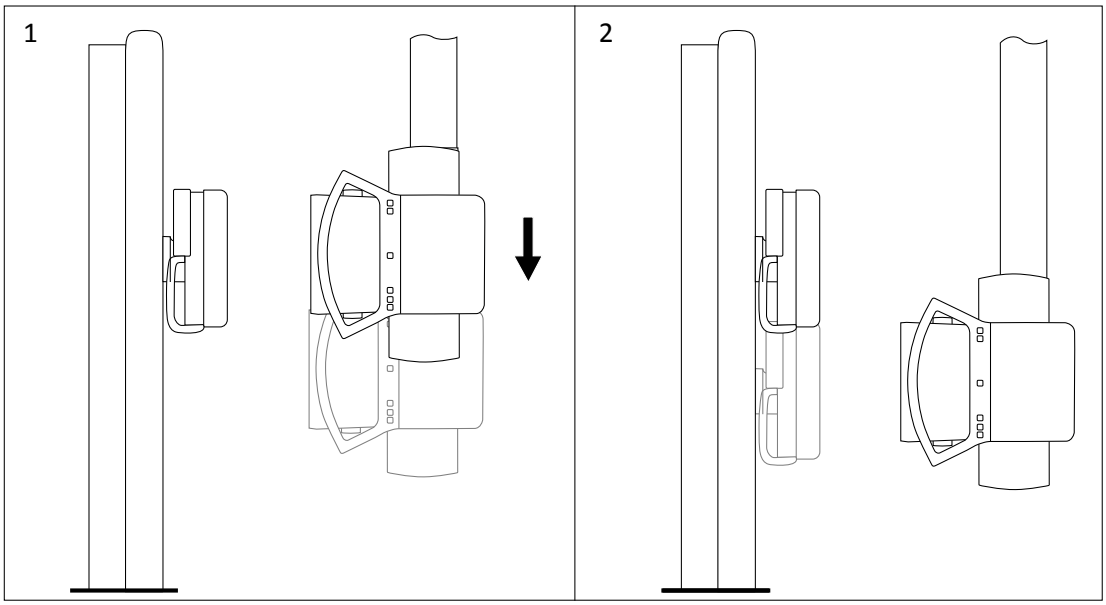
Alignment of Detector and Tube Assembly (Optional)

Automatic alignment of detector and tube assembly is possible with the ceiling suspension and the wall stand. With a press on a button, automatic alignment ensures that the central beam always meets the center of the detector after moving the tube assembly. This is independent of the detector angle or the tube assembly angle.

▷ Tracking is switched off.

▷ If the tube assembly is tilted, the ceiling suspension needs to be in a locked position.

► Move the tube assembly to the position needed (1).



► Press the button on the control grip for 2 s.

► The detector aligns automatically with the tube assembly (2).

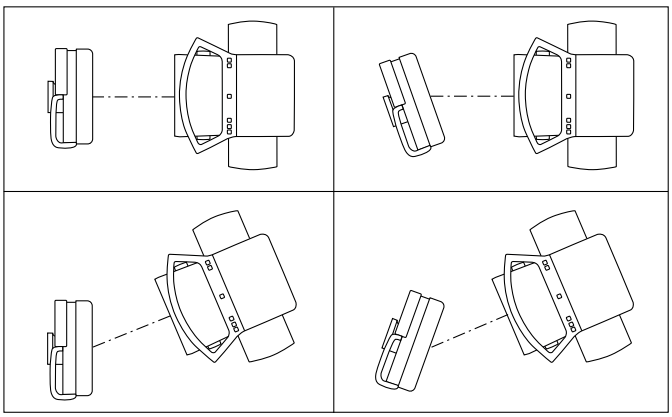


Fig. 21: Automatic alignment works in any detector-tube assembly position illustrated.

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Centering the Tube Assembly to the Portable Detector

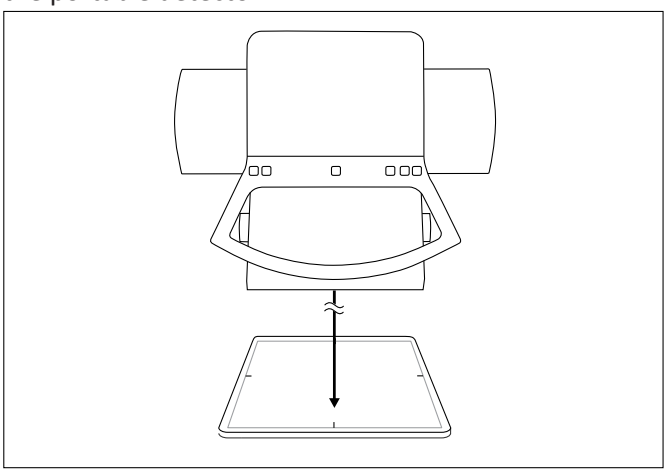
CAUTION

Do not look directly into the laser beam.

- ► Set the radiation beam axis to vertical.
- ► Rotate the collimator so that the sides of the radiation field are parallel to the portable detector.

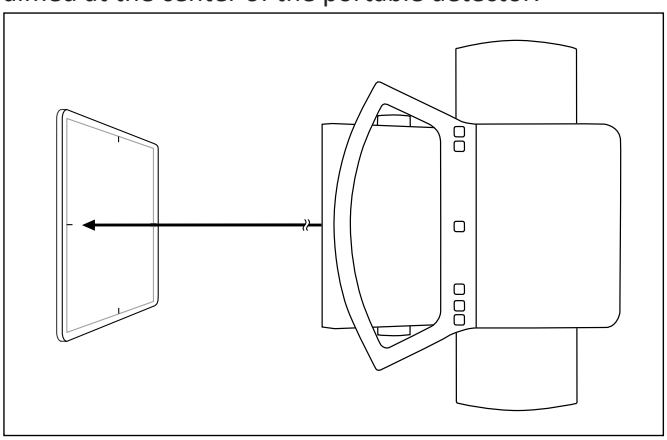
When a grid is used, do the following:

- ► Switch on the center laser.
- ► Adjust the portable detector or the tube assembly so that the laser is aimed at the center of the portable detector.



On the Mobile Detector Holder

- ► When you use a grid, adjust the portable detector or the tube assembly so that the laser is aimed at the center of the portable detector.



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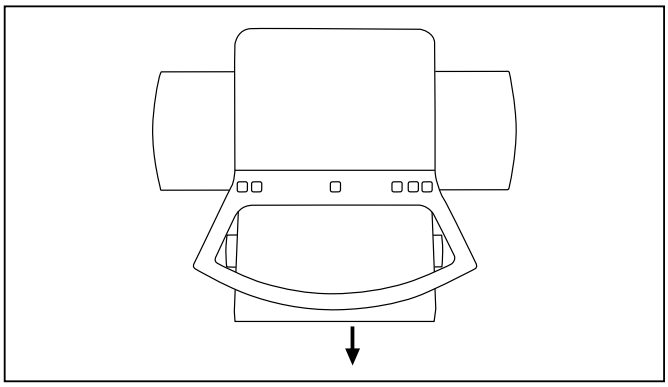
Determining the SID

► Pull out the tape measure parallel to the radiation beam axis as far as the detector plane indication.
When using a free cassette or the portable detector, pull out the tape measure as far as the top of the cassette or the top of the portable detector.



► Hold the tape measure for 2 s and wait for the beep.

⇨ The SID is stored and appears in the display field.

► Let go of the tape measure.

Setting the SID with a Second Laser for Free Exposures and Oblique Exposures (Option)

Free exposure technique:
Exposure directly on the detector; without automatic exposure control.

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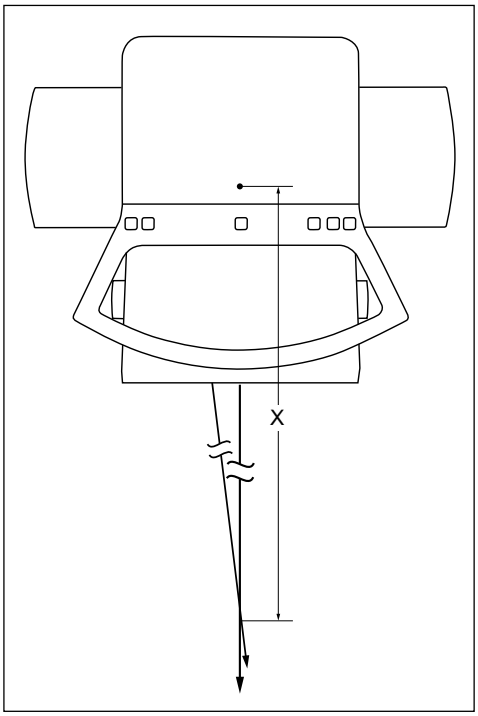
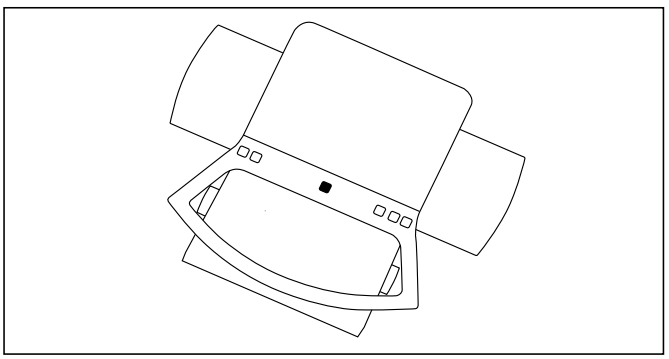
► For the free exposure technique you can have a **fixed SID (X) set** on your system. For this purpose, two laser beams, the center laser and the SID laser, are adjusted so that the SID is defined by their point of intersection.



When making oblique beam exposures, the SID laser is particularly helpful because you can set the SID at the same time as the angle. There is no need for any measurement or correction.

For a system with automatic collimation, you must transfer the set SID to the system with the tape measure, so that the size of the radiation field can be displayed correctly.

► Switch on both lasers.



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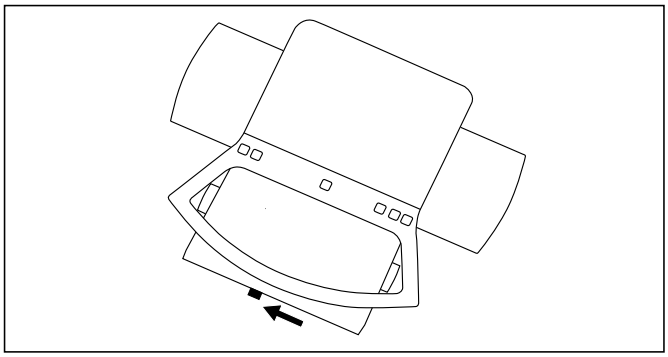
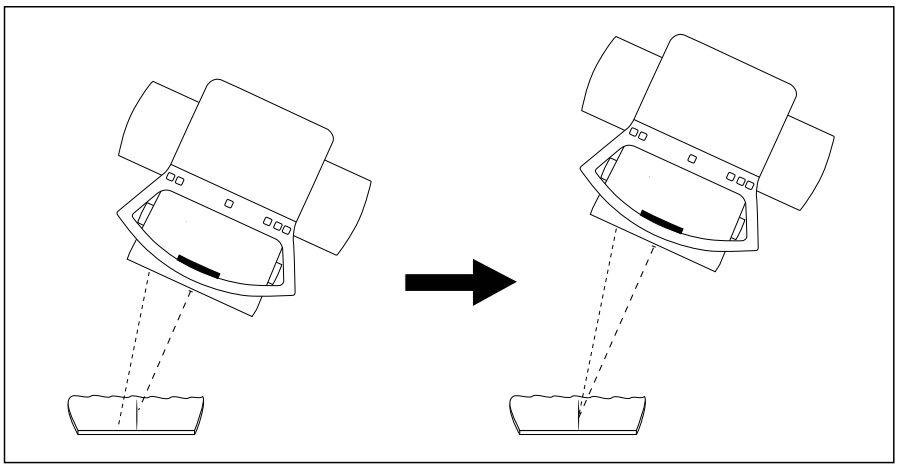
► Open the exits, if necessary.



► Rotate the tube assembly to the required angle; then move it horizontally or vertically so that the two lines coincide.



Collimation

Automatic Collimation

The radiation field size is automatically set to a pre-programmed value (view dependent) if the following applies:

- The system recognizes the SID (for example, via a ceiling stop-lock).
- The tube assembly is positioned perpendicular to the image receptor.

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► If necessary, use the knobs (**1**) to collimate to a smaller radiation field.

⇨ The current field size appears in the display.

⇨ After the exposure the collimator switches back to automatic mode.

Returning to the Last Set Value

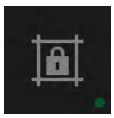
► Press  .

⇨ The last manually selected field size is set.

► Press  again.

⇨ The automatic preset value is set.

Manual Collimation



► Activate this button to disable automatic collimation.

⇨ "**Restrictions off**" appears in the display.

⇨ All collimation restrictions associated with automatic collimation are removed.

You can use manual collimation for the following:

- Exposures with an oblique central beam
- With the **Free cassette** and **Free detector** registration devices
- In case of defects that result in a “system not ready” status

► Change the field size as desired with the knobs (**1**).

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⇨ The resulting field size appears in the display.

NOTICE

When using the **Free cassette** and **Free detector** registration devices or with an oblique radiation beam axis: If you change the SID after manual collimation, you will have to measure it again. Otherwise the displayed radiation field size is incorrect.

When you set the collimation manually and select the desired view afterwards, the collimation that was set manually remains.

The collimator changes back to automatic collimation, when you perform one of the following:

- Release an X-ray and select the next view.
- Press the active view (background is blue) on the Eleva Workspot for a longer time.

Selecting Added Filters

You may work with added filters to reduce radiation exposure, especially for X-ray exposures performed on children.

Available filters:

- 0.1 mm Cu + 1 mm Al
- 0.2 mm Cu + 1 mm Al
- 0.5 mm Cu + 2 mm Al (only for detector calibration)

► Select an added filter.

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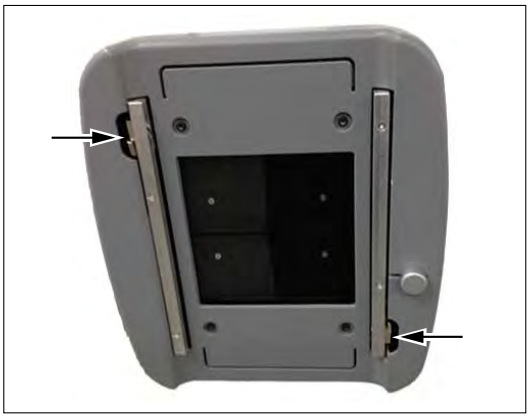
Inserting and Removing Accessories

Inserting an Accessory

- Insert the accessory into either of the collimator rails until both locks snap into place. The following figure shows the position of the locks.



- Make sure that the accessory is locked.

Removing an Accessory

- Press the lever to release both locks.

- Pull out the accessory.

Wall Stand (Optional)

Safety instructions

WARNING

Ensure that no one sits on the device.

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CAUTION

Risk of injury

When you tilt the detector of the wall stand, make sure that the patient does not get trapped between the ceiling suspension and the detector.

CAUTION

Risk of injury

When making exposures in the seated position, the patient must never stretch his or her legs under the tilted detector.

CAUTION

Before you release an exposure, always ensure that the detector is positioned correctly and aligned correctly with the tube assembly.

CAUTION

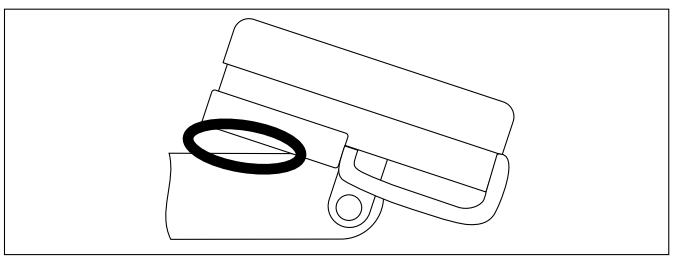
When the grid is only partly removed from the detector unit, be sure the patient does not collide with it during automatic movements of the wall stand.

Moving the Unit

Tilting the Detector Unit

WARNING

Risk of trapping fingers!



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NOTICE

Remove the stretch grip before you tilt.

NOTICE

When the detector unit moves from the vertical position into the horizontal position and vice versa, you possibly must adapt the measuring fields. You can configure the corresponding measuring fields for each detector position or manually select the correct measuring fields before the exposure.

NOTICE

When you tilt the detector unit from the vertical position into the horizontal position and vice versa (for more than 45°), ensure to select the corresponding registration device at the control grip and at the Eleva Workspot. Otherwise, the system will not give a ready light for exposure.

Into the horizontal position

Into the vertical position

Moving the Detector Unit into Default Position

NOTICE

You must always press  first.

NOTICE

When the detector unit moves from the vertical position into the horizontal position and vice versa, the measuring fields may need to be adapted. You may configure the corresponding measuring fields for each detector position or manually select the correct measuring fields before the exposure.

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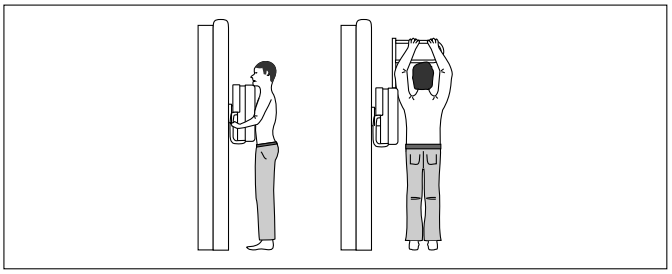
NOTICE

When you tilt the detector unit from the vertical position into the horizontal position and vice versa (for more than 45°), ensure to select the corresponding registration device at the control grip and at the Eleva Workspot. Otherwise, the system will not give a ready light for exposure.

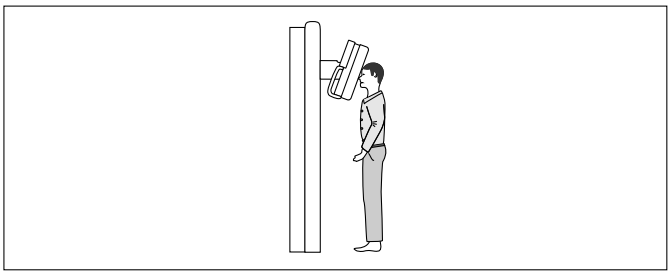
Detector unit raises (for example, for thorax exposures).



Stopping the movement:

- Press button again
- Press this

Detector unit raises and tilts to −20° (for example, for skull exposures).



Stopping the movement:

- Press button again
- Press this

Detector unit moves as follows:

- Moves from the vertical position into the horizontal position
- Tilts from −20° to 0°

The height remains the same.

Stopping the movement:

- Press button again
- Press this

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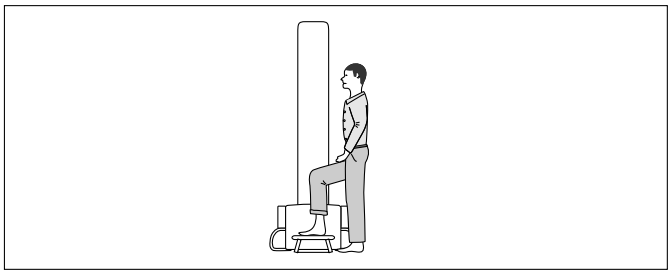
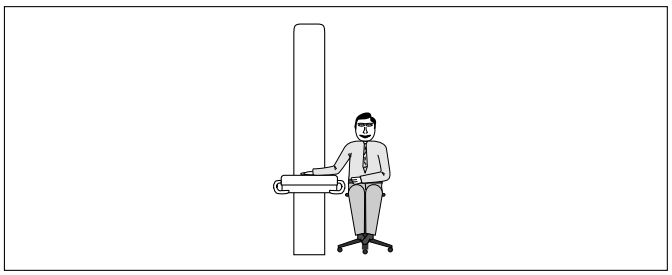
Detector unit lowers (for example, for foot exposures).



Stopping the movement:

- Press button again
- Press this

Detector unit lowers and tilts into the horizontal position (for example, for exposures of the extremities).



Stopping the movement:

- Press button again
- Press this

Detector unit moves as follows:

- Moves from the horizontal position into the vertical position
- Tilts from 0° to −20°

The height remains the same.

Stopping the movement:

- Press button again
- Press this

Alignment of Detector and Tube Assembly

You can automatically align the detector to the X-ray tube with a X-ray tube assembly tilt of 0° or 90°.

In addition, when a motorized ceiling suspension is installed, you can automatically align the detector to the X-ray tube with a detector angle up to 45°.

This function is independent of tracking. It only functions with tracking disabled or inactive.

► Press this button for 2 s.

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⇨ The detector aligns itself to the X-ray tube assembly.

► When the detector starts moving, release the button.
The movement is stopped when the following has happened:

- You have pressed another button.
- There is a collision.

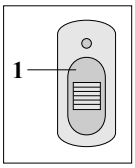
If you perform the X-ray tube assembly movement again after the detector movement has finished, the alignment is lost.

NOTICE

Always check alignment visually and by light field.

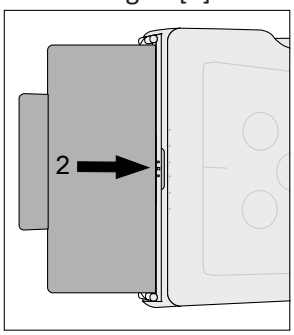
Changing the Grid

Inserting the Grid



► Press the key [1], if the yellow LED is not lit.

► Insert the grid [2] into the slot until stop.

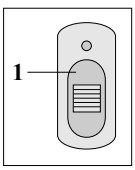


⇨ The grid moves automatically into the starting position.

⇨ The yellow LED first flashes and then lights.

Removing the Grid

▷ If the yellow LED is continuously lit, this indicates that a grid is inserted.



► Press key [1].
The grid moves into the change position.

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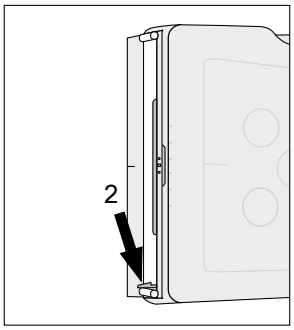
► Press down lever [2].



The action of the spring causes the grid to protrude slightly from the slot so you can grasp it easily.

► Remove grid.

► Insert new grid
or

► Press key [1] again for exposures without grid. If the key is not pressed, the grid carriage moves into its working position after 20 seconds.

NOTICE

A continuously flashing yellow LED indicates a grid jam. Remove and re-insert the grid.

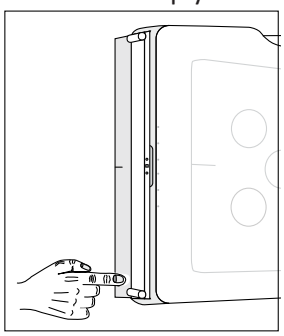
NOTICE

Grid is heavy

Do not drop the grid; you might damage it.

Parking/Removing the Grid

Behind the flap you can park 2 grids.



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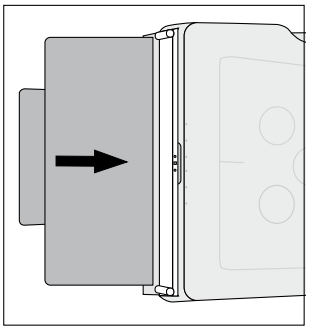
- Open flap: press briefly.



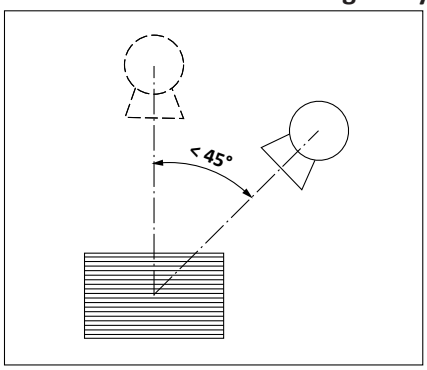
- Park/remove grid in slots provided.
- Close flap.

Correct Use of the Grids

CAUTION

Risk of image artifacts

An X-ray tube that is tilted by more than 45° in relation to the Bucky unit can cause image artifacts. A retake of an image may be necessary.



NOTICE

To avoid gridline artifacts, the central X-ray beam must be over the center gridline. Always move the tube assembly parallel to the direction of the gridlines.

When using a grid, the optimal image quality will be achieved when the SID equals the f_0 for the grid.
However, an SID as recommended is tolerable.

For the recommended SID ranges, see chapter “Technical Data”.
You will receive significant image artifacts if you are not within the recommended SID range.

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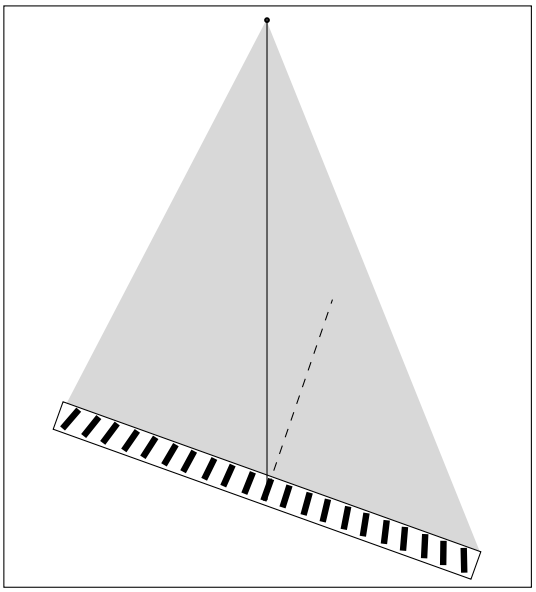
Incorrect Use of the Grids

Tilted

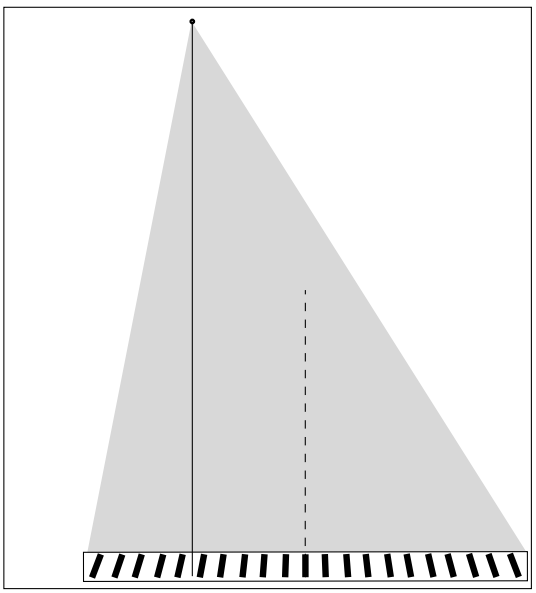
▷ The Bucky unit with inserted grid is tilted so that the immediate central X-ray beam does not meet the grid perpendicularly. Therefore less radiation passes the grid.



► Tilt the Bucky unit so that the central X-ray beam meets the grid perpendicularly.

Not Centered

▷ The tube is laterally moved so that the cental X-ray beam does not meet the center of the grid.



► Move the tube laterally so that the central X-ray beam meets the center of the grid.

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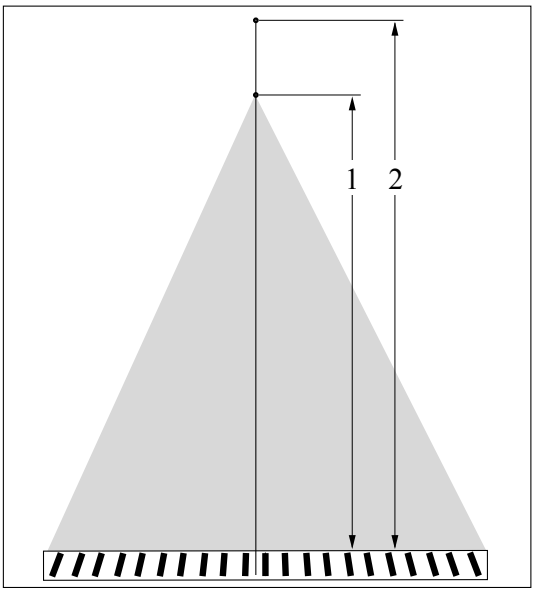
Wrong SID

▷ The SID (1) set is different from the SID (2) specified for the grid.



► Set the SID to the recommended SID range for the grid.

Fixed Detector (Optional)

Safety Instructions

CAUTION

A collision or a shock may damage the detector.

If the detector is in a collision or experienced a shock, check that the detector is working properly:
– Inspect the detector for visible cracks or defects. If you detect any defects, contact customer service.
– Create a test image. If the image is homogenous, you can still use the detector. If not, continue with the next step.
– Perform a detector calibration and create a test image. If the image is homogenous, you can still use the detector. If not, contact customer service.

NOTICE

Unwanted or excessive radiation

Always select the correct measuring field for the examination. Make sure that the measuring field always corresponds with the region of interest and is fully covered by the body. Otherwise you may cause unwanted or excessive radiation.

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NOTICE

The detector performance may degrade if it is too hot. Make sure that the ventilation openings are not obstructed.

NOTICE

The detector performs self-calibration at regular intervals. During self-calibration the ready indicator on the imaging workstation goes off for short spans of time. The generator is still ready for use. If this happens while you just intend to release X-ray, please wait for a few seconds and try again. If you try to make an exposure, no X-rays are released.

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SkyPlate (Optional)

SkyPlate

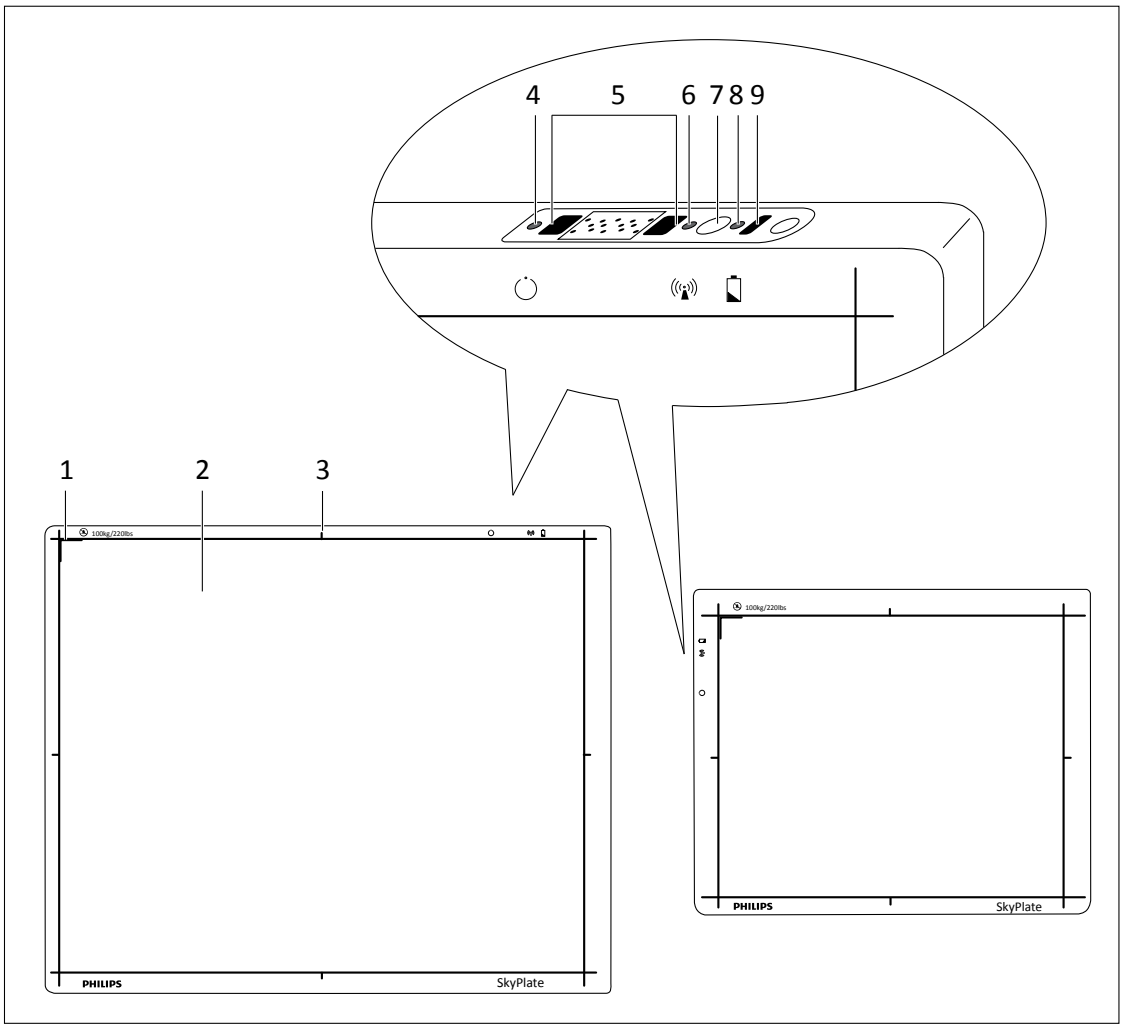

Fig. 22: Front view 35 cm × 43 cm (14 in × 17 in) format and 24 cm × 30 cm (10 in × 12 in) format

No.	Description	Function		
1	Corner marking	This indicates the top left of the detector.		
2	Sensitive area	This delineates the effective imaging area of the detector. For radiation protection purposes, the radiation field should never exceed this area.		
3	Center marks	For checking if the X-ray tube assembly is correctly centered on the detector.		
4	LED		Detector status	green = ready for exposure flashing green = sleep mode red = not ready for exposure

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No.	Description	Function		
5	Connector	For connecting the backup cable. The backup cable delivers data to the Eleva Workspot.		
6	LED		WiFi status (connection for data transfer to the work-station)	green = connection OK red = WiFi connection not ready (detector not connected to an access point) no light = WiFi connection switched off
7	Switch on/off	To switch off the detector, press the button for 5 seconds. After 5 seconds, the LED of the detector status changes to flashing red. Release the button. All LEDs turn off. Switch off the detector before removing the battery. The detector switches on automatically as soon as the battery is inserted. If the image has not yet been transferred to the Eleva Workspot, you cannot switch off the detector.		
8	LED		Battery status	green = OK red = power low flashing red = not enough power to create an image
9	Infrared sensor	For connecting the detector to the system.		

NOTICE

- The SkyPlate changes to sleep mode in the following cases:
  − You are in the Patient list section.
  − The SkyPlate is not selected as a registration device.
  − The SkyPlate is not attached.
  − The system is shut down.
  − The SkyPlate is out of the WiFi range.
  Then the SkyPlate enters the sleep mode within 1 minute.
- When you move the detector or when you change to the Examination section, the detector is ready for exposure again. The LED of the detector status changes to green.
- When you switch off the system or detach the SkyPlate, the SkyPlate switches off automatically after 20 minutes.

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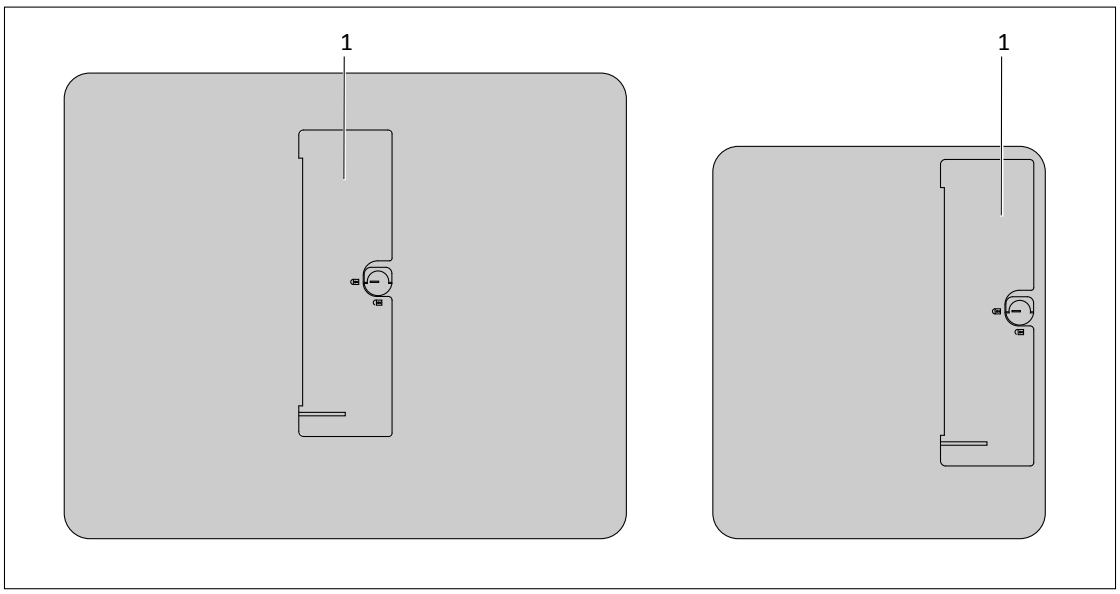

Fig. 23: Rear view 35 cm × 43 cm (14 in × 17 in) format and 24 cm × 30 cm (10 in × 12 in) format

No.	Description
1	Battery

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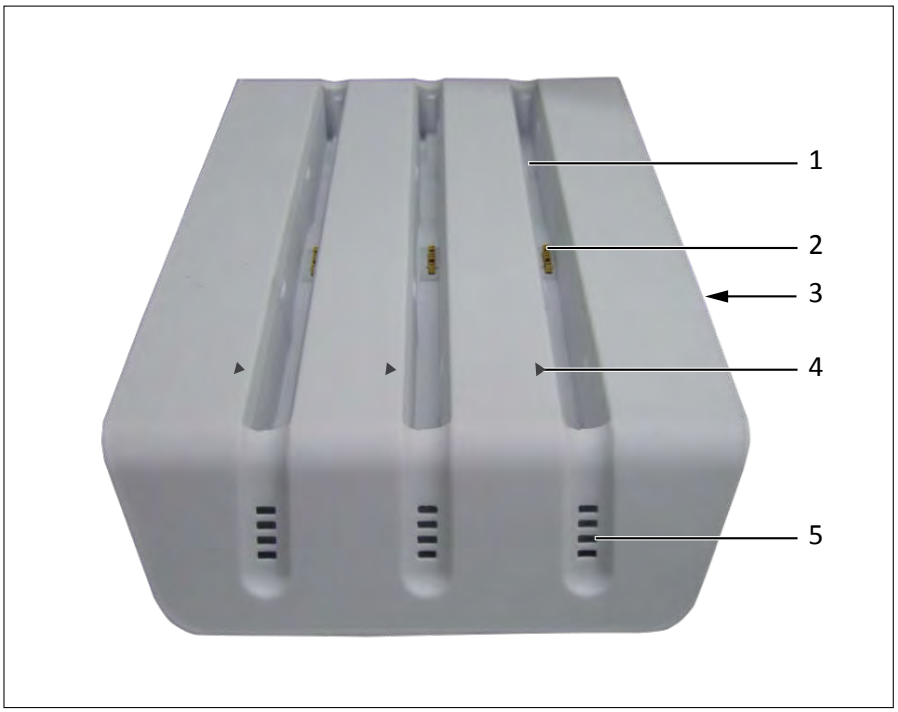
Battery Charger



No.	Description
1	Battery slot
2	Connector to battery
3	Power supply connection and LED
4	Mark for alignment with battery
5	Status LED

NOTICE

Do not place the battery charger within the patient environment.

Do not touch the battery connector pins.

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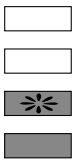
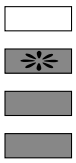
Charging Status

Symbol						
LED	Orange	Flashing green	Flashing green	Flashing green	Flashing green	Green
Charging level	Error signal	0%–25%	25%–50%	50%–75%	75%–100%	100%

Error Types

LED	What it indicates	What to do
Orange status LED lights up	The battery has not been inserted correctly into the charger.	Remove battery and reinsert. If the problem remains, the battery might be defective.
	The battery has overheated.	Remove the battery and reinsert after it has cooled down.
No green power LED	No power from power supply.	Check that the power supply is on.
No LEDs light up	The battery has not been inserted correctly into the charger.	Remove the battery and reinsert. If the problem remains, check whether the connectors are damaged or the battery is defective.

Safety Instructions

WARNING

Life supporting devices and pacemakers

Special care must be taken when using the detector close to life supporting devices and pacemakers.

WARNING

Risk of injury

Handle the detector with care. If the detector falls down, patient or personnel may get injured.

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WARNING

The detector has no lead shielding. Be aware that X-rays can pass through the detector. Use a lead apron or a massive wall as X-ray shielding.

WARNING

Risk of insufficient image

During X-ray exposure the detector must be stable. Otherwise you may get a blurred image.

CAUTION

Dropping the detector may damage it.

If the detector is dropped, check that the detector is working properly:

- **Create a test image. If the image is homogenous, you can still use the detector. If not, continue with the next step.**
- **Perform a detector calibration and create a test images. If the image is homogenous, you can still use the detector. If not, contact customer service.**

CAUTION

Risk of delayed diagnosis

Philips recommends using more than one detector in emergency rooms. Should a detector not work, you have backup.

CAUTION

High loads may damage the detector.

When the patient weighs more than 100 kg (220 lb), use the panel protector in weight bearing exams.

CAUTION

Scratches on images

If the image shows scratches, create a test image. Check, whether the detector can still be used.

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CAUTION

Expose the correct side of the detector.

Be sure to position the detector correctly. The radiation must be aimed at the sensitive area on the front side of the detector. If the radiation is aimed at the back of the detector where the battery is located, an exposure is released but no usable image is generated.

CAUTION

Usage of the portable detector in an incubator

Make sure that the portable detector is at a comfortable temperature (hand-hot) before you place it under the baby. Keep the usage time of the portable detector in the incubator reasonably short. Remove the portable detector from the incubator after the examination.

CAUTION

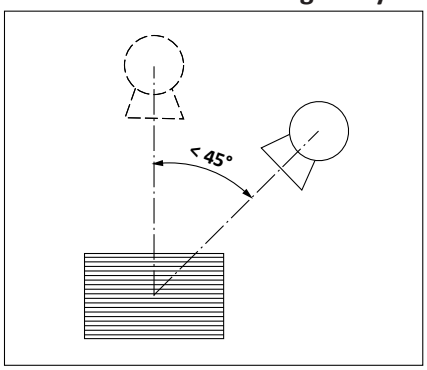
Risk of artifacts

Make sure not to scratch the cover of the detector with any sharp objects, for example, an external fixation.

CAUTION

Risk of image artifacts

A detector that is tilted by more than 45° in relation to the X-ray tube can cause image artifacts. A retake of an image may be necessary.



NOTICE

Before each use, inspect the detector for visible cracks or defects.

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NOTICE

The detector is equipped with a shock sensor that is triggered whenever the detector is subjected to any kind of excessive force not in keeping with its intended use. Dropping the detector from a height of more than 70 cm (27.6 in), for example, will trigger the shock sensor. Incidents of this kind are recorded in the detector's internal shock sensor log, which can be accessed only by customer service.

Following any jolt or other excessive force, take the following steps to determine whether the detector is still functioning properly:

- ► Inspect the detector for visible cracks or defects.
- ► Create a test image. If the image is homogenous and free of errors, you can continue using the detector. If not, continue with the next step.
- ► Perform a detector calibration and create another test image. If the image is homogenous and free of errors, you can continue using the detector. If not, continue with the next step.
- ► Contact customer service.

During regular maintenance or other visits, your service technician will read out the detector's internal log and compare the recorded number of severe shocks to the previously documented condition of the detector. The current condition is then documented and signed by the customer and the service technician.

NOTICE

Due to the sensitivity of the detector the Amplimat measuring chamber could be visible in the image.

Safety Instructions for the SkyPlate Protection Cover

If a SkyPlate Protection Cover is attached, the SkyPlate has the label “SkyPlate Protection Cover” on the front side. If your SkyPlate has a SkyPlate Protection Cover, regard the following notes:

NOTICE

Risk of artefacts

Before each use, inspect the imaging area of the SkyPlate for visible cracks or defects.

If the SkyPlate Protection Cover shows any visible cracks or defects in the imaging area, the following applies:

- ► Use a different SkyPlate or fixed detector.
- ► Alternatively, remove the SkyPlate Protection Cover (see the instructions below), before you continue to use the concerned SkyPlate.

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- Remove the two small covers on the rear side of the SkyPlate (see image 1 below).
- Remove the large cover on the rear side and front side of the SkyPlate. Start with the rear side (see image 2 below).
- Make sure to remove all remains of the SkyPlate Protection Cover.
- When you remove the SkyPlate Protection Cover, make sure not to damage the SkyPlate, not to use any sharp tools and not to let the SkyPlate slip off the table.

To protect the SkyPlate from damages, Philips recommends to have the damaged SkyPlate Protection Cover replaced by customer service. For more information, contact customer service.

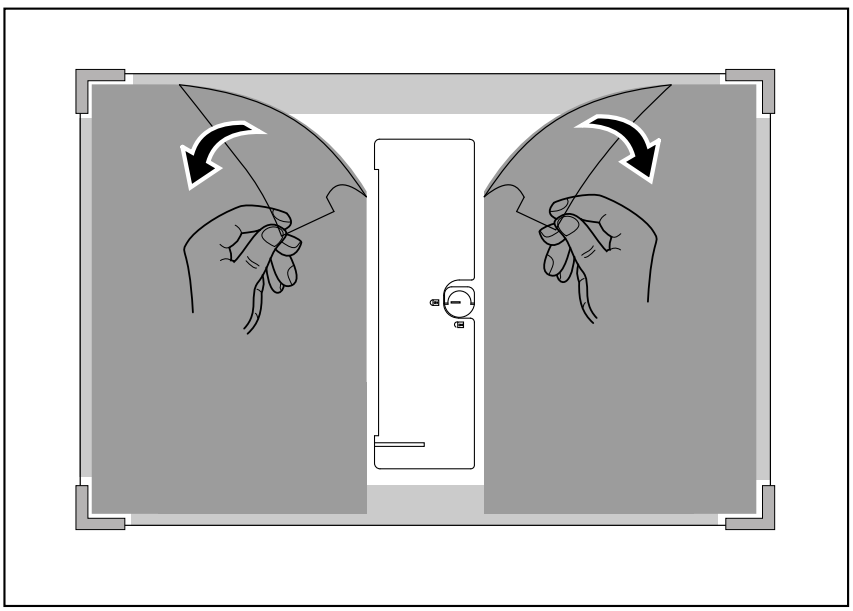
In general, Philips recommends to have the SkyPlate Protection Cover replaced by customer service at least once a year.

Label with Identifying Number

The SkyPlate may be labeled with an identifying number for detector sharing. When you remove the SkyPlate Protection Cover, make sure that the label is still attached to the SkyPlate. If the label does not stick firmly anymore, replace it with a new label.

Removing the SkyPlate Protection Cover

1



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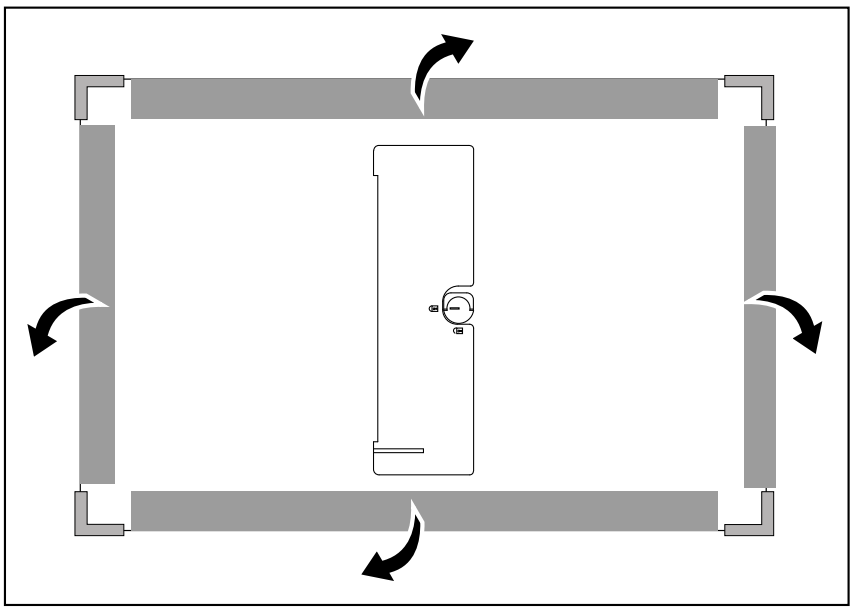
2



Using the Detector

► Select the free detector registration device at the Eleva Workspot.

WARNING

For exposures on the portable detector, make sure that the free detector registration device is selected at the Eleva Workspot.

NOTICE

When you are using the wireless portable detector with the wall stand bucky unit, select the wall stand registration device. Nevertheless, ensure that you follow all safety and usage instructions for the wireless portable detector.

NOTICE

Risk of technical artifacts

Make sure that the detector temperature is within the calibrated temperature range. Otherwise image artifacts may occur.

► Therefore, check the calibrated temperature range of the connected detector in the section: **system/portable detector**.

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- ► Set the exposure parameters as you would for a cassette exposure. The system default configuration is set to a 400 speed screen-film system equivalent. This can be set differently, if needed. Change kV and/or mAs settings. If you want to set different settings permanently, call customer service.
- ► Before releasing exposures, make sure that the X-ray field size is set correctly. For example, that the X-ray field size is limited to the region of interest and that the detector's sensitive area is not exceeded.
  Nevertheless, choose an SID that is large enough to fully cover the detector. Use the X-ray light field indicator at the collimator to check this.
- ► Make sure, that the detector is switched on.
- ► Check the LED that indicates the detector status. When the LED is green, the detector is ready for exposure.
- ► Check the LED that indicates the WiFi status. When the LED is green, the WiFi connection is OK.
- ► Check whether the detector is connected to the system. Make sure that the identifying number shown on the detector is displayed in the generator area.
- ► Check the battery status in the generator area.

- ► At the Eleva Workspot, the green ready indicator (symbol) appears at the bottom left, when the detector is ready for use. If the symbol is gray, the detector is not ready. Check for this indication before any attempt to X-ray your patient.

⇨ After releasing the exposure, the image is shown on the screen.

⇨ Do not switch off the detector before the image has been completely read out. As soon as the image has been read out, the green ready indicator appears again.

- ► Switch off the detector.

NOTICE

Automatic switch-off

The detector switches off automatically under the following conditions:

- The battery is empty.
- The detector is disconnected for more than 20 min.
- The system has been switched off for more than 20 min.

Recovering Images from the Detector

It may happen that the detector cannot transfer the image to the Eleva Workspot. In this case, the image is still saved in the detector. You can recover the image from the detector.

▷ The WiFi connection is interrupted before or while transferring the image from the detector to the Eleva Workspot.

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▷ A message appears whether you want to retry the transfer of the image or you want to retrieve the image later.

► If you want to retry the transfer now, check whether the WiFi status LED of the detector is green. If not, connect the backup cable.

► Confirm the message with **OK**.

⇨ The system reads out the image and matches it automatically to the view that was selected during exposure.

► If you want to retrieve the image later, cancel the message.

► At a later date, connect the detector and check whether the WiFi status LED of the detector is green. If not, connect the backup cable.

⇨ The system reads out the image and matches it automatically to the view that was selected during exposure.

NOTICE

- The system always saves the last 5 images from the detector in **System**/**Quality assurance**/**Test Images**. With the move tool, you can move the images to the correct patient. (The move tool is described in section “Moving Images Between Examinations”.)
- If the system cannot match an image to a patient or view, it creates a patient “Image Recovery” in the patient list that contains the image. With the move tool, you can move the image to the correct patient.
- For stitching images: You cannot move recovered images into a stitching view. Therefore, you cannot stitch recovered images.

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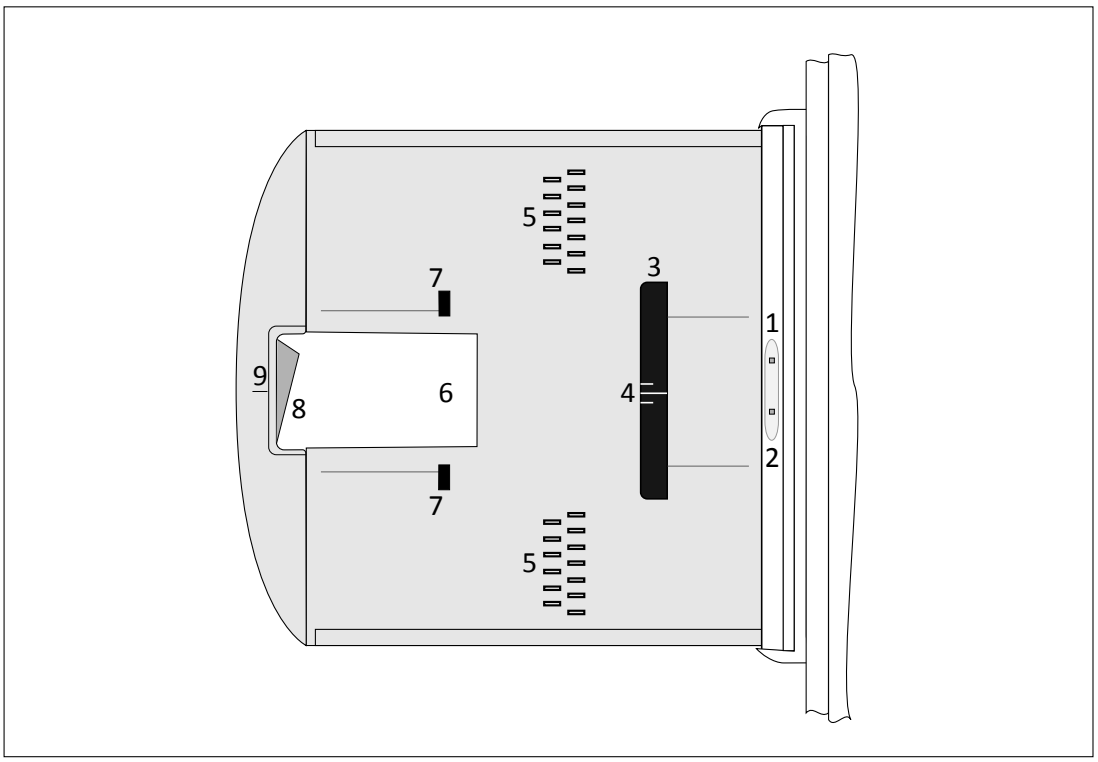
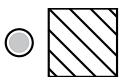
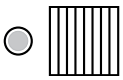
Inserting and Removing the Detector at the Wall Stand

Bucky Tray (Bucky Unit SkyPlate)



No.	Meaning	
1	Detector indicator (green): 	
	LED	**Detector status**
	Off	No detector inserted
	On	Detector inserted correctly*
	Blinking	Detector not inserted correctly*
2	Grid indicator (yellow): 	
	LED	**Grid status**
	Off	No grid inserted
	On	Grid inserted correctly
	Blinking	Grid jam

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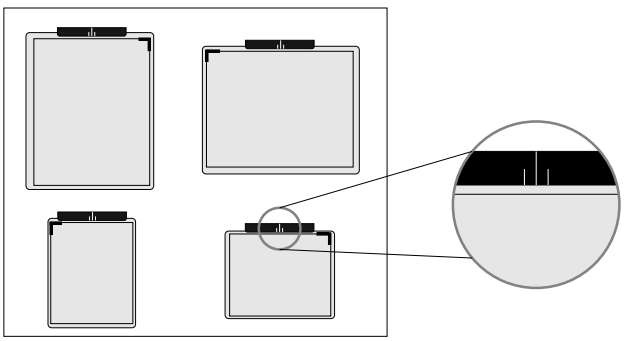
No.	Meaning
3	Guiding bar for positioning and clamping the detector
4	Centering lines for correct positioning
5	Pins for size sensing and holding the detector in place
6	Opening for grasping the detector
7	Clamping tabs
8	Lever for opening and closing the Bucky tray
9	Mark for centering the tube assembly to the detector

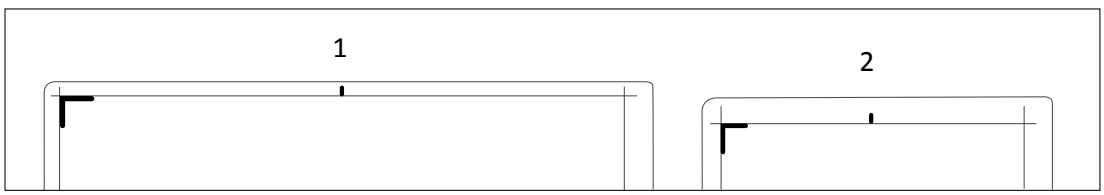
* Certain positions are not supported, even though the LED lights up. For details on correct positioning of the detector see chapter “Positioning the Detector in the Bucky Tray” on page 160.

Centering Lines

There is a set of centering lines on the guiding bar. When you insert the detector, ensure that the centering mark on the detector is aligned with these centering lines.



Top-of-Image Indicator



When inserting the detector into the tray, ensure that the Top-of-Image indicator is orientated to the patient´s head.

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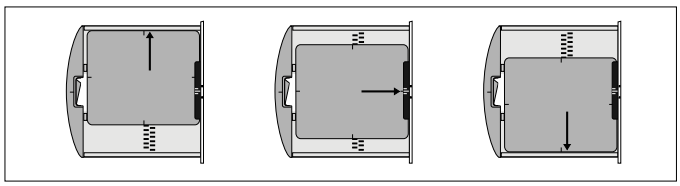
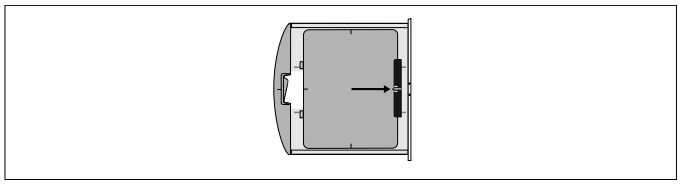
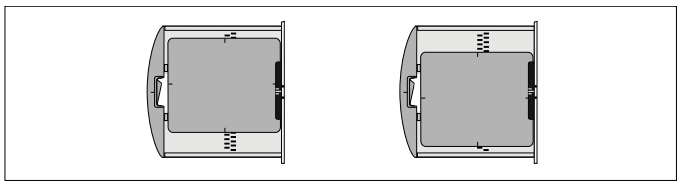
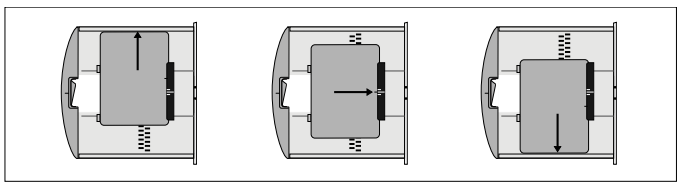
NOTICE

Use of Lead Markers

To avoid false interpretation of body direction (left ↔ right) and patient orientation, Philips recommends the use of lead markers, as traditionally used in conventional radiography.

Positioning the Detector in the Bucky Tray

The large and small SkyPlates can be positioned in the center of the Bucky tray, as described above. In addition, you can position the detectors on the top or bottom of the Bucky tray. The correct use of off-center positioning depends on the detector used and the orientation of the detector in the Bucky tray.

Correct positioning of the large SkyPlate	
 ✓	When the large SkyPlate is inserted with its short edge against the guiding bar, it can be positioned in the center or all the way on the top or bottom of the Bucky tray.
 ✓	When the large SkyPlate is inserted with its long edge against the guiding bar, the detector takes up the complete width of the Bucky tray, so it can be positioned only in the center.
Incorrect positioning of the large SkyPlate	
 ✗	With the short edge against the guiding bar, the large SkyPlate must not be positioned in between center and top or bottom position.
Correct positioning of the small SkyPlate	
 ✓	When the small SkyPlate is inserted with its long edge against the guiding bar, it can be positioned in the center or all the way on the top or bottom of the Bucky tray.
Incorrect positioning of the small SkyPlate	

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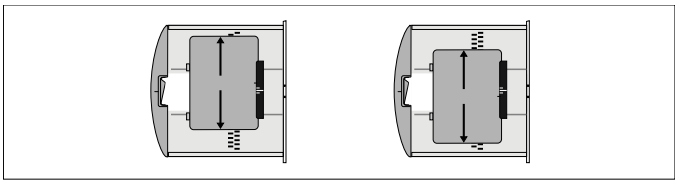
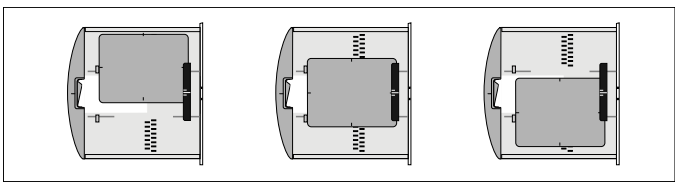
	With the long edge against the guiding bar, the small SkyPlate must not be positioned in between center and top or bottom position.
	Do not insert the small SkyPlate in landscape position (with the short edge against the guiding bar). Off-center positioning is not supported, and in center position the clamping mechanism pushes against the power button and switches the detector off.

NOTICE

If the detector is not positioned correctly in the Bucky tray, the green detector status indicator lamp will blink. Ensure that the green indicator lamp is lit and not blinking before you continue.

Inserting the Detector in the Bucky Tray

CAUTION

Risk of trapping fingers!

To avoid injury, always be careful while inserting or removing the detector.
Grasp the detector only at the openings of the Bucky tray.

CAUTION

The Bucky tray is intended for use only with the SkyPlate detectors. Do not insert imaging cassettes in the Bucky tray. Imaging cassettes must be used only for free exposures.

Make sure to insert the detector correctly as described in the following steps.

- ► Pull the lever and open the Bucky tray by pulling it out until it locks into loading position.

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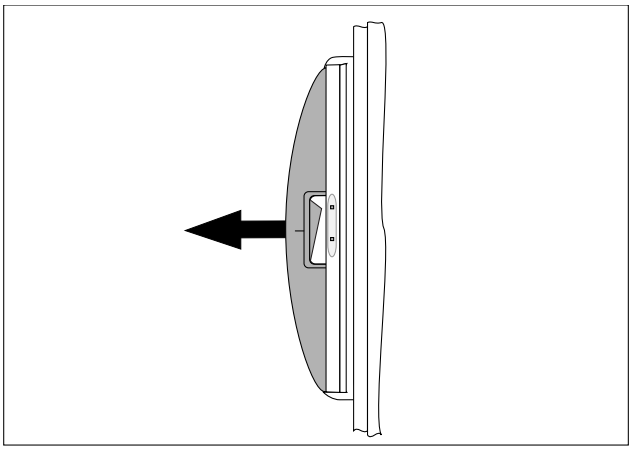
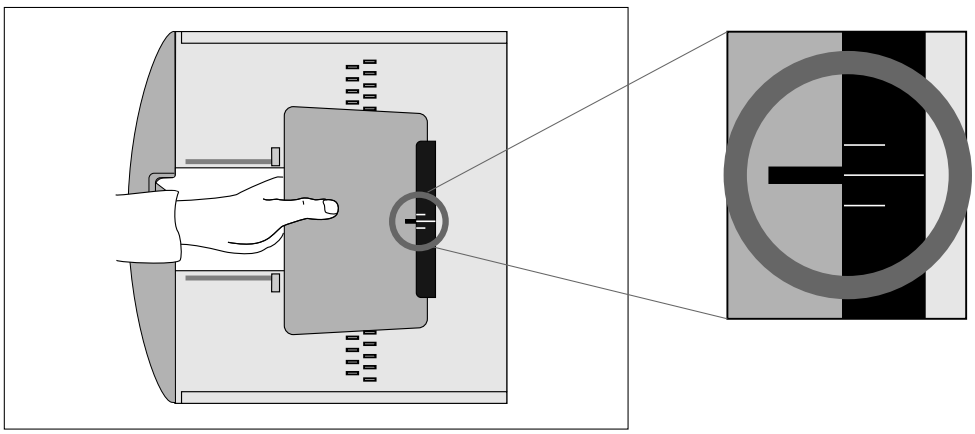
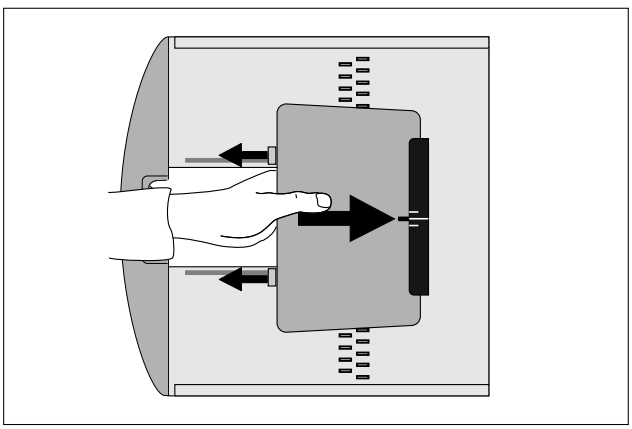


► Insert the detector straight against the guiding bar. Align the centering mark on the detector to the centering lines on the guiding bar.



► Push the detector against the guiding bar to open the clamping mechanism. The clamping tabs move away from the guiding bar.



► When the detector fits in place between the clamping tabs and guiding bar, carefully release pressure. The clamping tabs and guiding bar move back together to hold the detector in place in the Bucky tray.

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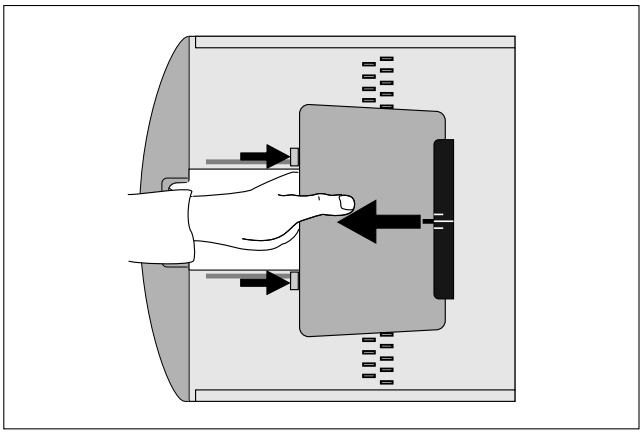
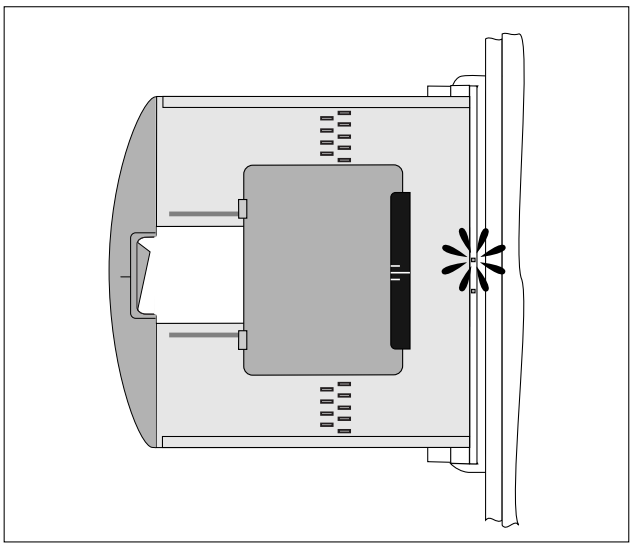


► If the detector is inserted correctly the green indicator lamp lights up. A blinking green indicator lamp means that the detector is not inserted correctly in the Bucky tray. In this case, correct the position of the detector before you continue.



► Pull the lever and close the Bucky tray completely. The unit detects the size of the inserted detector.

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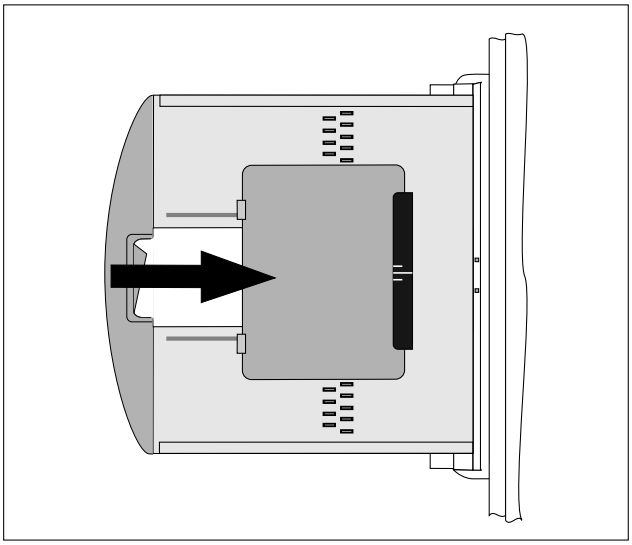
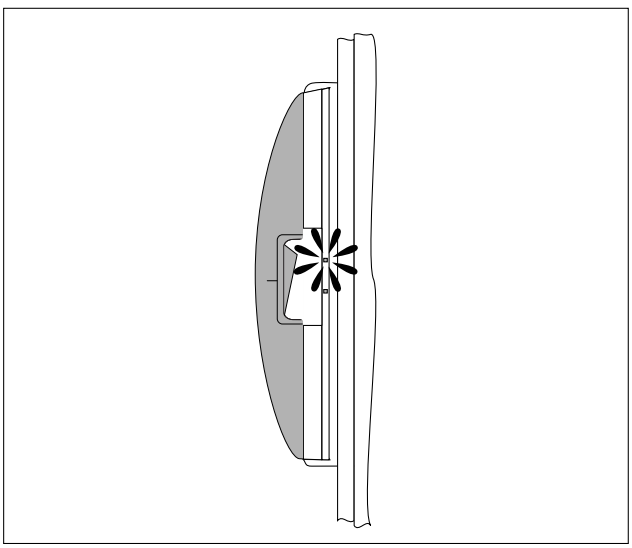


- If the unit was not able to detect the size of the detector or the detector was not inserted correctly, the green indicator lamp will blink when the Bucky tray is closed. In this case, re-open the Buck tray and correct the detector position. Ensure that the green indicator lamp is lit and not blinking before you continue.



Removing the Detector from the Bucky Tray

Make sure to correctly remove the detector as described in the following steps.

- Pull the lever and open the Bucky tray by pulling it out until it locks into loading position.

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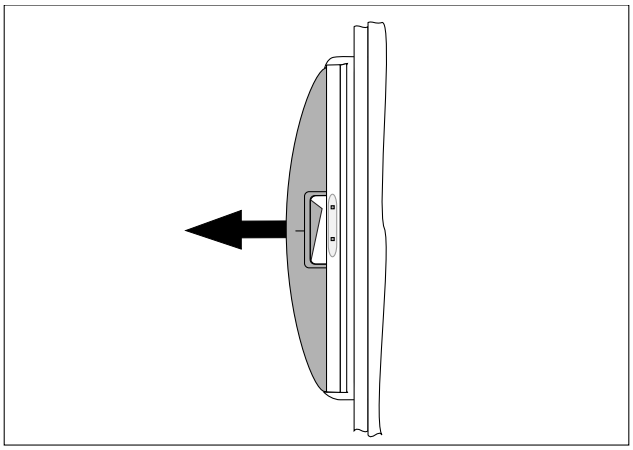
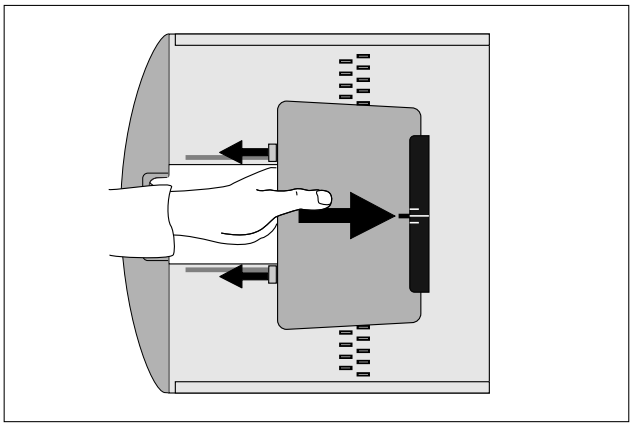
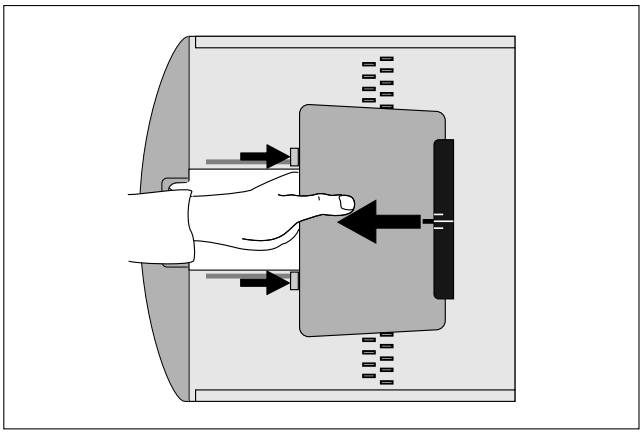


► Push the detector against the guiding bar to open the clamping mechanism. The clamping tabs move away from the guiding bar so that the detector can be removed.



► Pull the side of the detector next to the clamping tabs away from the tray, carefully release pressure, and then pull the other side out of the guiding bar. The clamping tabs and guiding bar move back together.



► Pull the lever and close the Bucky tray completely.

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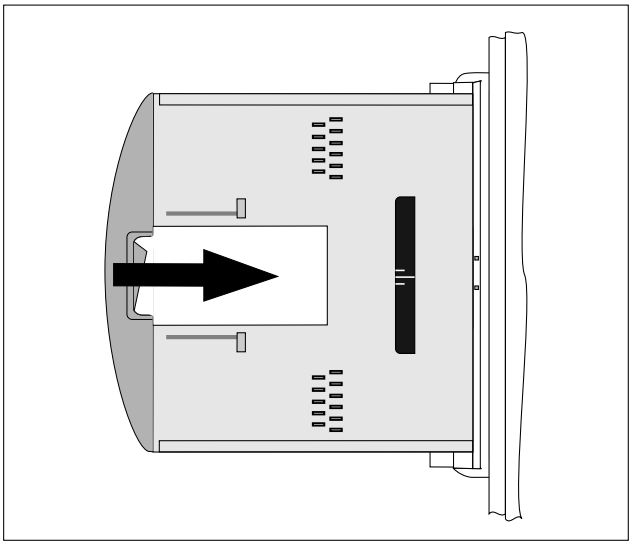
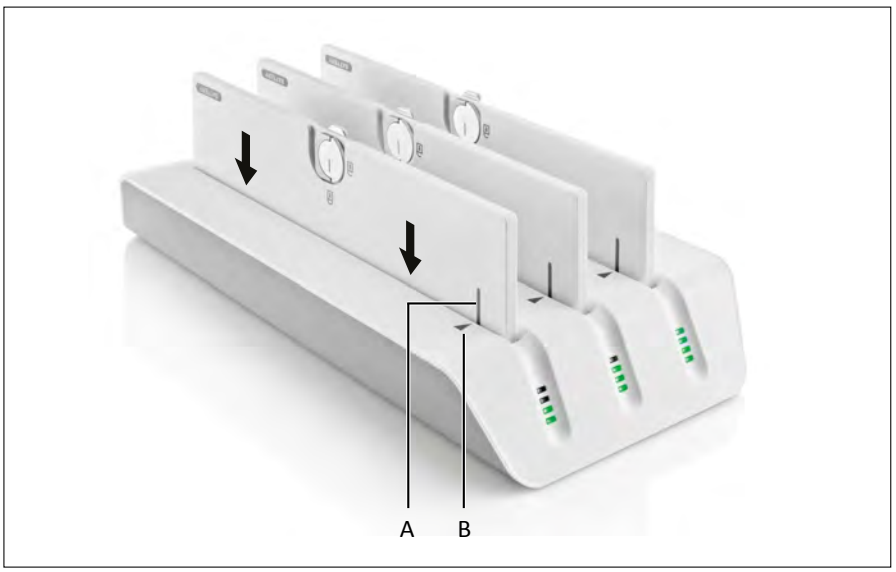


How to Use the Battery Charger



- ► Insert the battery into the battery slot. Make sure that the mark (A) on the battery is aligned with the mark (B) on the battery charger.
- ► Fully recharge the battery.
- ⇨ The four green LEDs light up completely.
- ► Pull the battery out of the battery slot.

You can charge up to three batteries at the same time.

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Changing Batteries

WARNING

Risk of electric shock

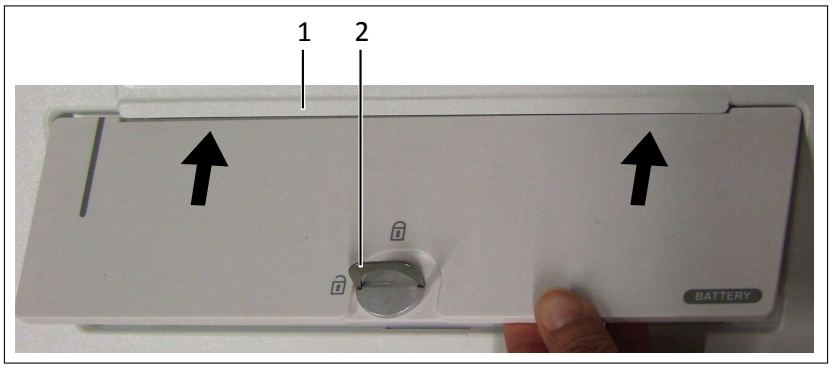
Do not change the battery within the patient environment.

CAUTION

Loss of data

Do not remove battery before the image created appears on the screen.

Inserting the Battery



- ► Push the battery against the attachment strip (1).
- ► Insert the battery.
- ► Turn the flap (2) to lock.

- ► Lower the flap (2).

Removing the Battery

NOTICE

Do not remove the battery or turn off the detector during the image transmission. Otherwise, the image will be deleted.

▷ The detector must be switched off before removing the battery.

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- ► Raise the flap (2).
- ► Turn the flap (2) to unlock.

- ► Remove the battery.

Using the Short Backup Cable (2 m)

Connecting the Backup Cable

NOTICE

Only use the backup cable in the following cases:

- There is no WiFi connection.
- You do not want to use the WiFi connection (see section “Electromagnetic Compatibility”).

CAUTION

Risk of injury or system damage

Do not trip on the backup cable.
Otherwise the following may occur:

- **You may fall.**
- **A connected detector may fall to the floor.**
- **The backup cable may be damaged if it is jerked.**
- **The Eleva Workspot may be damaged if the backup cable is jerked.**

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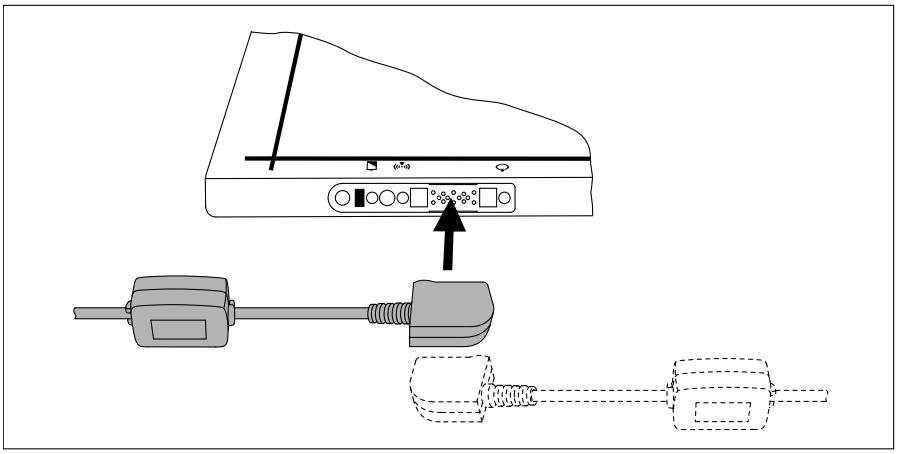
► Connect the backup cable to the detector.



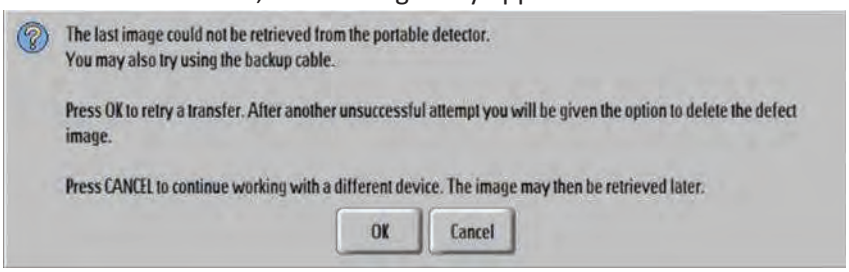
You can attach the backup cable in two ways as shown in the figure.

⇨ Magnets on the detector guide the backup-cable plug into place.

NOTICE

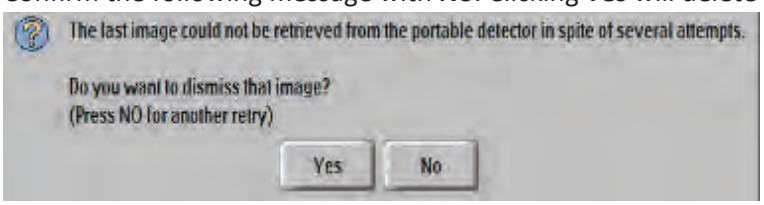
The other end of the backup cable has already been connected to the Eleva Workspot during installation.

► On the user interface, this message may appear several times. Click **OK**.



If you have clicked **Cancel** accidentally, change the registration device you are working on. (Example: Change from free detector to free cassette and then back to free detector again.) Then the message appears again.

► Confirm the following message with **No**. Clicking **Yes** will delete the image.



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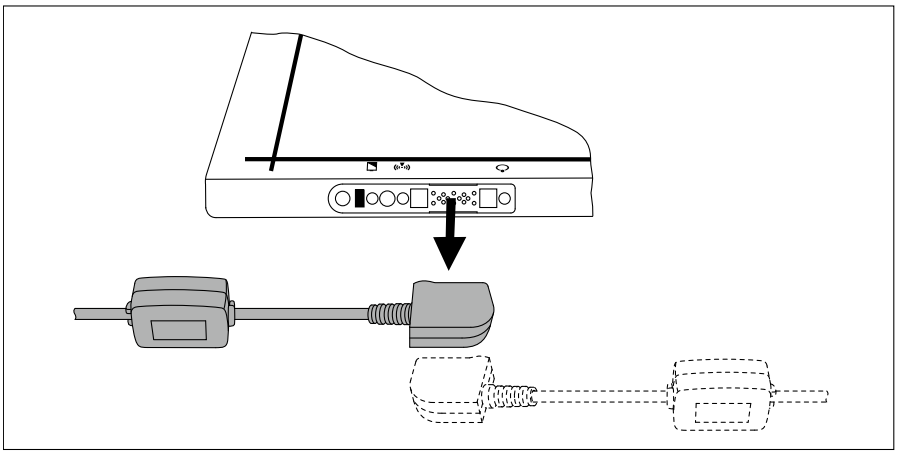
Disconnecting the Backup Cable

Remove the backup cable from the wireless portable detector as shown in the following figure.



NOTICE

You must not disconnect the backup cable from the Eleva Workspot computer.

NOTICE

Risk of cable damage

After use, make sure that you store the backup cable properly. Do not leave the cable lying on the floor.

Storing the Backup Cable

- ► Coil up the cable.
- ► Place the cable on top of or next to the Eleva Workspot computer.

Using the Long Backup Cable (7 m)

Connecting the Backup Cable

NOTICE

Only use the backup cable

- if there is no WiFi connection.
- if you do not want to use the WiFi connection (see chapter “Electromagnetic Compatibility” on page 27).

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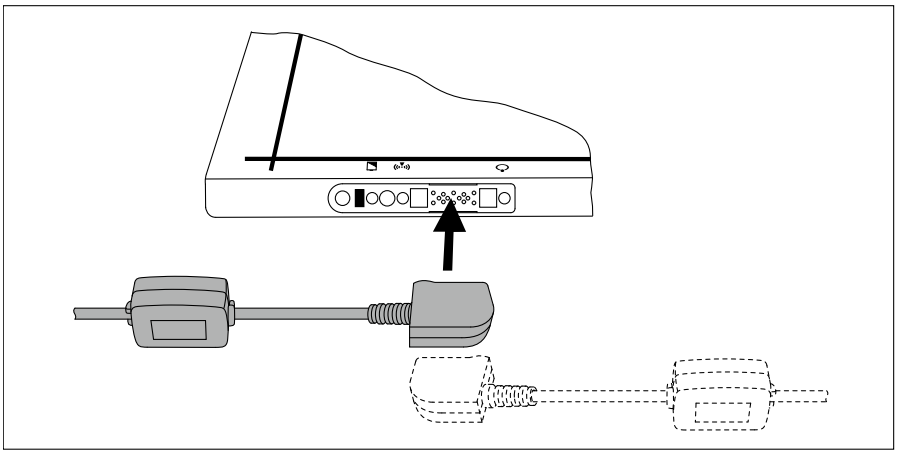
CAUTION

Risk of injury or system damage

Do not trip on the backup cable. Otherwise:

- **You may fall.**
- **A connected detector may fall to the floor.**
- **The backup cable may be damaged if it is jerked.**
- **The Eleva Workspot may be damaged if the backup cable is jerked.**

► Connect the backup cable to the detector.



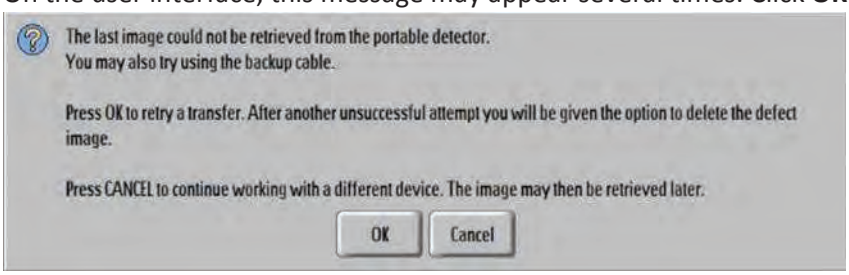
You can attach the backup cable in two ways as shown in the figure.

⇨ Magnets on the detector guide the backup-cable plug into place.

NOTICE

The other end of the backup cable has already been connected to the Eleva Workspot during installation.

► On the user interface, this message may appear several times. Click **OK**.



If you have clicked **Cancel** accidentally, change the registration device you are working on. (Example: Change from free detector to free cassette and then back to free detector again.) Then the message appears again.

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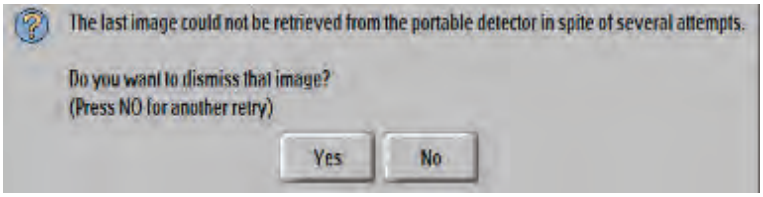
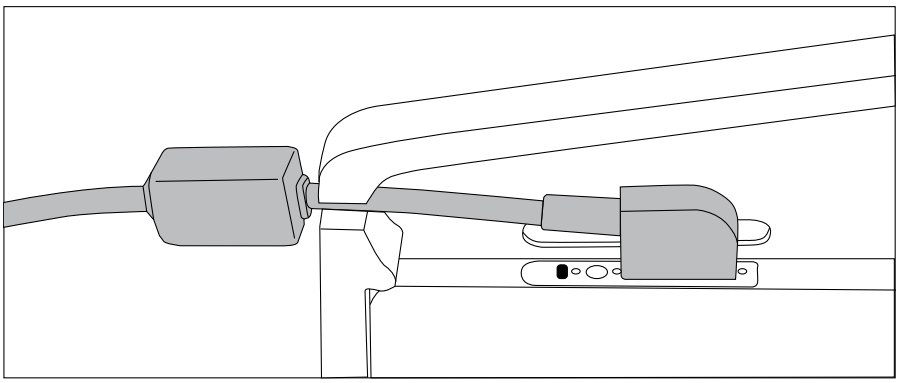
► Confirm the following message with **No**. Clicking **Yes** will delete the image.



Using the Backup Cable with the Large Grid



► Connect the backup cable as shown in the figure.

You cannot use the backup cable with the small grid.

Using the Long Backup Cable for Making Exposures

NOTICE

Use the long (7 m) backup cable only for exposures. The short (2 m) backup cable is not intended for use in the patient environment.

NOTICE

Ensure that you follow all relevant safety messages for use of the long backup cable (see chapter “Connecting the Backup Cable” on page 170).

► Switch off the WiFi connection if it is active: At the Eleva Workspot, go to **Portable Detector** in the **System** section and ensure that the WiFi connection is switched off.

► Connect the long backup cable to the detector.

► Make exposures as usual.

► When you have finished, disconnect the backup cable and switch the WiFi connection back on at the Eleva Workspot.

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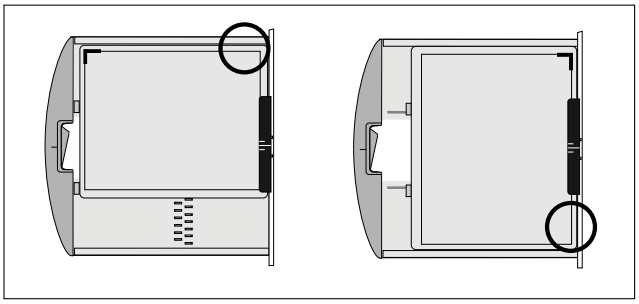
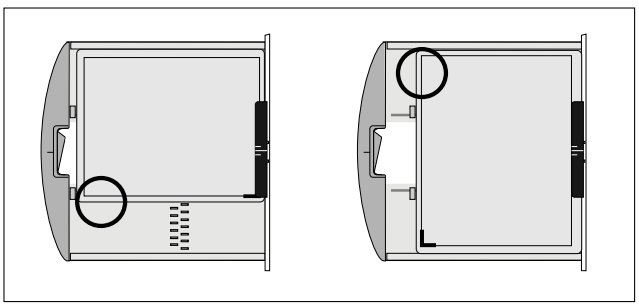
Using the Detector with the Backup Cable in the Bucky Tray

- ► At the Eleva Workspot, ensure that the WiFi connection is switched off.
- ► Insert the portable detector in the Bucky tray (see “Inserting and Removing the Detector”).
- ► Connect the long backup cable to the detector.

Positioning the Detector with the Backup Cable Connected



When the backup cable is connected, you cannot position the detector like this. The circle indicates the connector to the backup cable.



When the backup cable is connected, you can position the detector like this. The circle indicates the connector to the backup cable.

NOTICE

The system expects that the detector is positioned with the Top-of-Image indicator oriented to the patient's head. When you rotate the detector because of the backup cable, you must also rotate the image afterwards.

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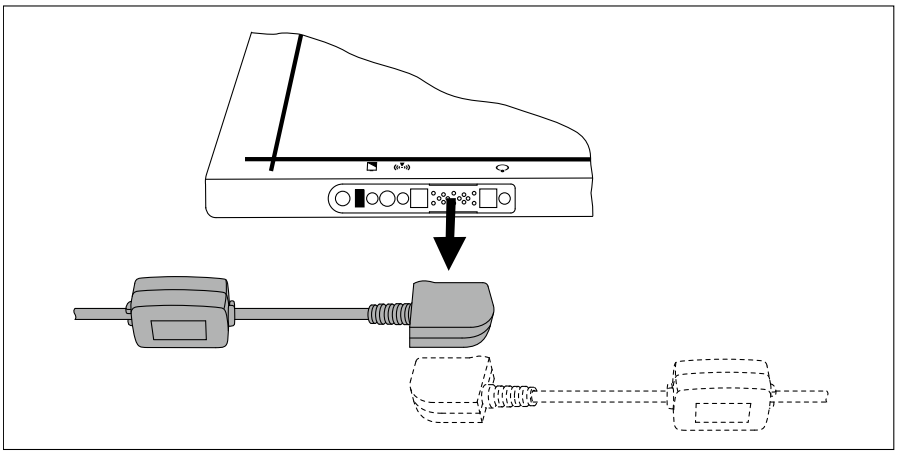
Disconnecting the Backup Cable

Remove the backup cable from the wireless portable detector as shown in the following figure.



NOTICE

You must not disconnect the backup cable from the Eleva Workspot computer.

NOTICE

Risk of cable damage

After use, make sure that you store the backup cable properly. Do not leave the cable lying on the floor.

Storing the Backup Cable

► Loop the cable over the cable holder as shown in the following figure.

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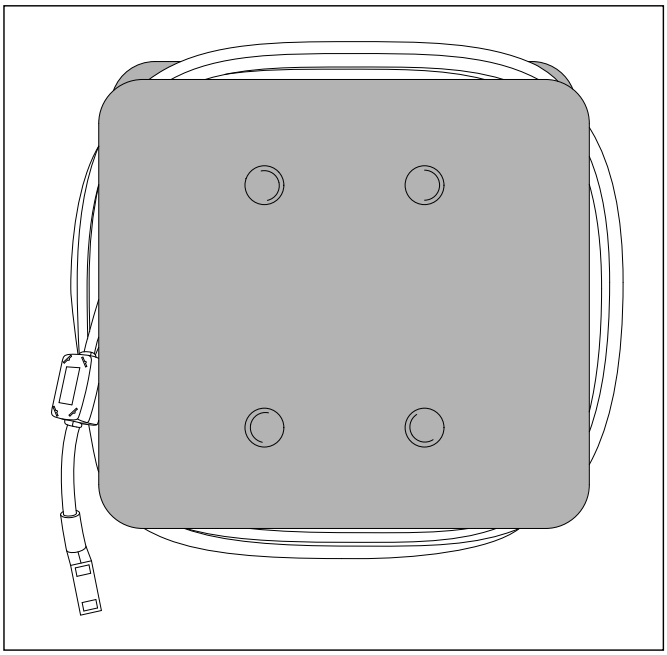

Detector Sharing

Introduction

Detector Sharing is a feature that allows you to use a SkyPlate on different systems.

The systems intended for detector sharing are:

- DigitalDiagnost 4.0 or higher
- MobileDiagnost wDR 2.0 or higher
- ProGrade 1.0 or higher
- CombiDiagnost R90 1.0 or higher
- ProxiDiagnost N90 1.0 or higher

Preconditions

- An initial detector calibration has been performed for each shared detector on each system where the detector is intended to be used.
- Customer service has assigned an unique identifying number to each detector and has put a label with this number onto the detector. So each detector is labeled with an identifying number.

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Fig. 24: Label with Identifying Number for Detector Sharing

CAUTION

Differentiating the detectors

A unique number is given to differentiate the detectors. Compare the number on the detector with the number given on the generator area at the Eleva Workspot.

NOTICE

When you have used the detector with system A and want to use it afterwards with system B, first you have to connect it to system B.

Workflow

The following instructions describe how to share the detector between system A and system B.

▷ The detector is currently connected to system A.

► Check the LED that indicates the battery status.

- Green: Continue to follow the procedure.
- Red or flashing red: Switch off the detector and remove the battery. Put the battery into the battery charger until it is fully charged. To continue working, use another fully charged battery.

► Hold the detector with the infrared sensor in front of the infrared adapter of system B. Use the WiFi symbol on the detector as an orientation point. Keep the detector in front of the infrared adapter until the three LEDs change from flashing red to flashing green.

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NOTICE

- Connecting the detector takes up to 2 minutes.
- During the connection procedure, no exposure is possible with any other registration device (wall stand, table, free cassette).
- After the connection: If no valid calibration data is available, you will need to calibrate the detector.
- The infrared adapter connects any detector within a radius of 20 cm (8 in).
  To avoid unintended connection, keep a distance of more than 1 m (39 in) between the adapter and unused detectors.

CAUTION

Do not place unused detectors next to the infrared adapter.

► During the connection, some user guidances are displayed that indicate the status of the connection.

⇨ When all LEDs flash three times simultaneously, the detector is successfully connected.

► Select the **Examination** section.

⇨ The generator area displays the identifying number of the connected detector (1) and its battery status (2).

After connecting the detector to system B, the battery status is displayed as follows:

System A		The generator area displays the detector label with the identifying number (in this example “01”) and the icon “no battery information.” This indicates that the detector “01” was the last detector connected to system A.
System B		The generator area displays the detector label with the identifying number (in this example “01”) and the battery icon. This indicates that the detector “01” is connected and active in system B.

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CAUTION

Risk of retaking an image

Check that the detector you want to use is connected.

Battery Status of the Detector on the Eleva Workspot

Symbol	Color	Charging level	LED at detector	System status
	Green	80%–100%	Green	Exposure possible
		60%–80%		
		40%–60%		
		20%–40%		
	Yellow	10%–20%	Red	Exposure possible for approx. 5 more images/10 min
	Red	5%–10%	Red	If the ready symbol appears, exposure is possible.
		<5%	Flashing red	No exposure possible. A message appears, that the battery is empty.
	Gray			No battery information No exposure possible.

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NOTICE

If you have successfully connected a detector, but the system does not show a ready light for exposure, check the identifying number.

If by accident several detectors have the same identifying number, the system will show a user guidance during detector connection at system B. The system will then continue to connect the detector. At the detector, the LEDs for WiFi connection and for detector status will be green.
But the system will show no ready light for exposure. In this case, connect the detector to system A again.
Ask the customer service to change the identifying numbers of the detectors.

Using Attachable Grids with the SkyPlate

Installing the Large Grid

CAUTION

Risk of grid damage

When the patient weighs more than 100 kg (220 lb), do not use grids.

The grid is fixed on a grid frame.

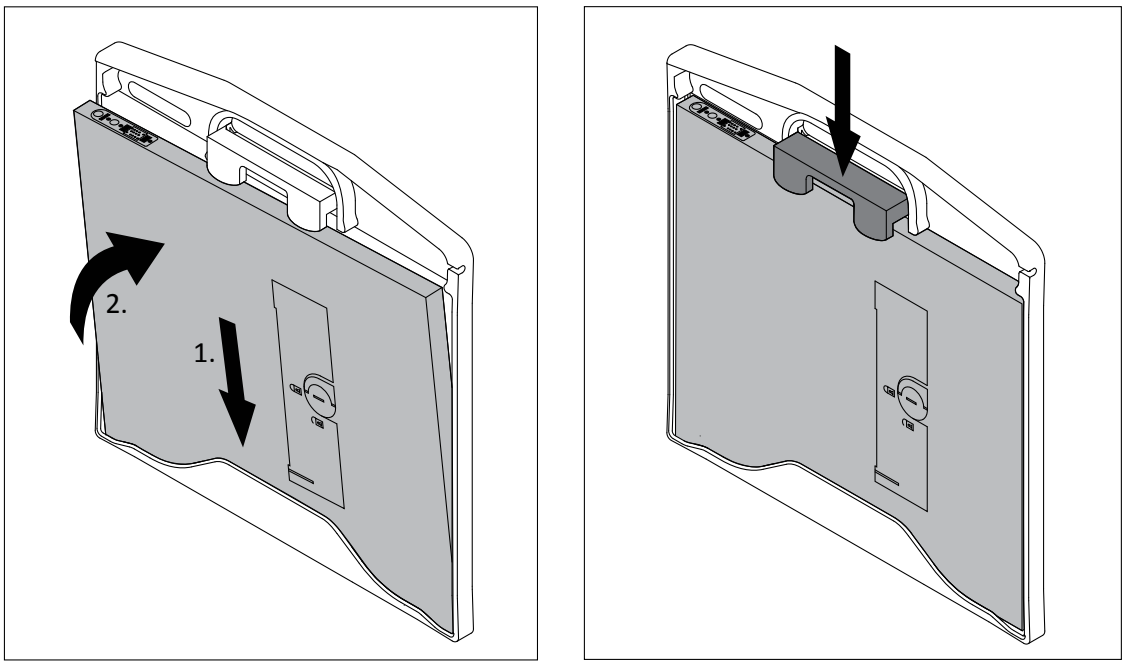

Fig. 25: Inserting the Detector into the Grid Frame

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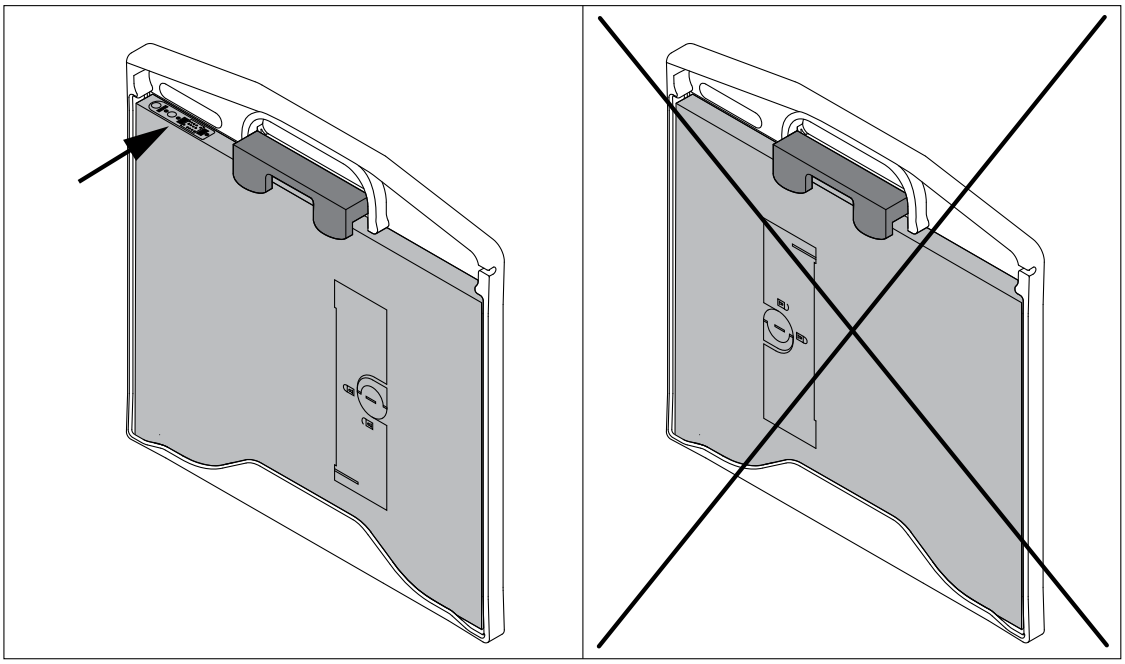
Make sure that the detector is inserted correctly. The LEDs must be positioned as shown:



The Eleva Workspot detects that the grid is attached to the detector. The Eleva Workspot recognizes and removes the grid lines from the image.

Dismantling the Large Grid

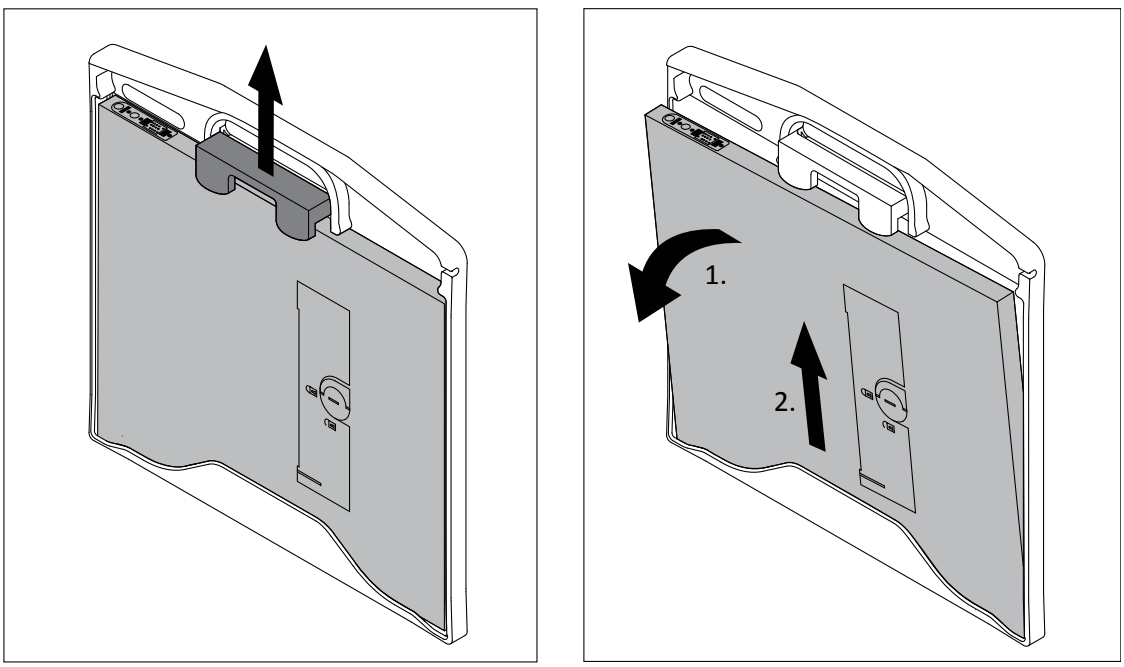


Fig. 26: Removing the Detector from the Grid Frame

The Eleva Workspot detects that there is no grid attached to the detector.

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Installing the Small Grid

CAUTION

Risk of grid damage

When the patient weighs more than 100 kg (220 lb), do not use grids.

The grid is fixed on a grid frame.

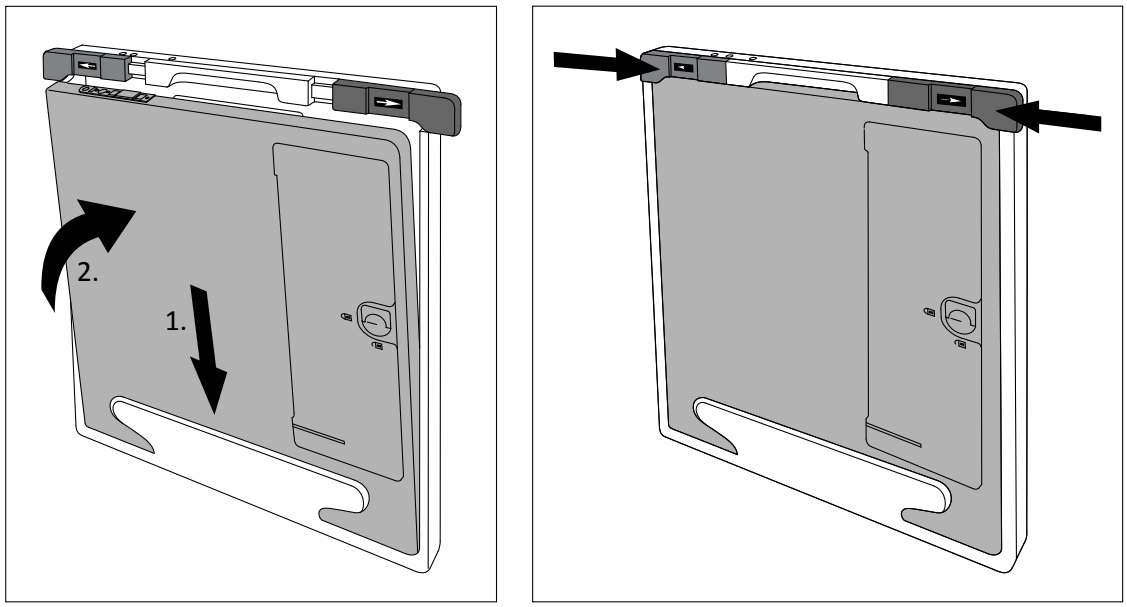
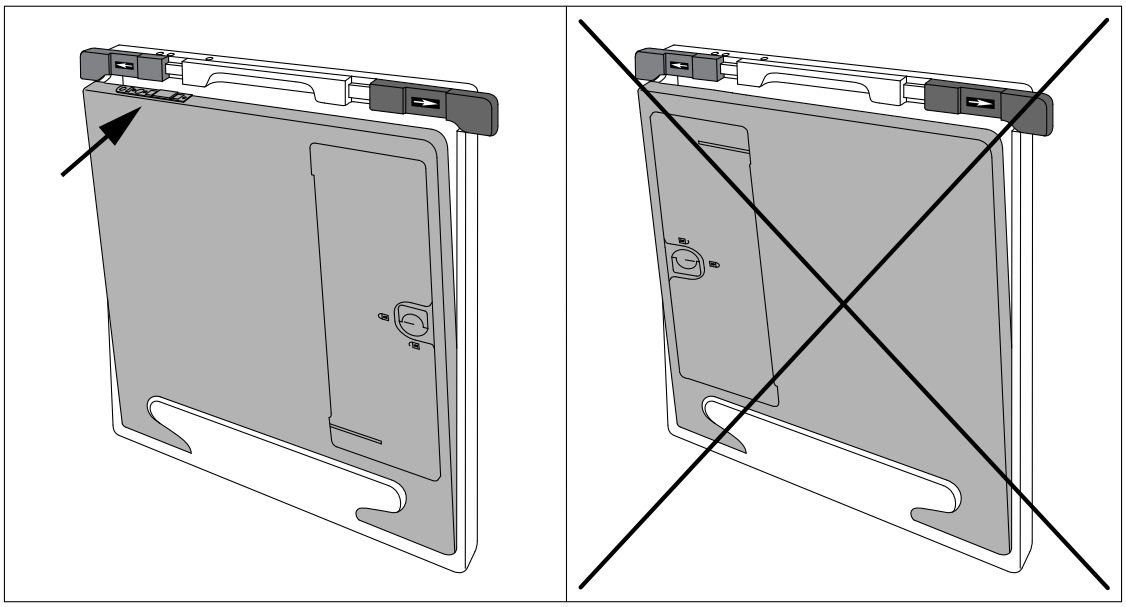


Fig. 27: Inserting the Detector into the Grid Frame

Make sure that the detector is inserted correctly. The LEDs must be positioned as shown:



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The Eleva Workspot detects that the grid is attached to the detector. The Eleva Workspot recognizes and removes the grid lines from the image.

Dismantling the Small Grid

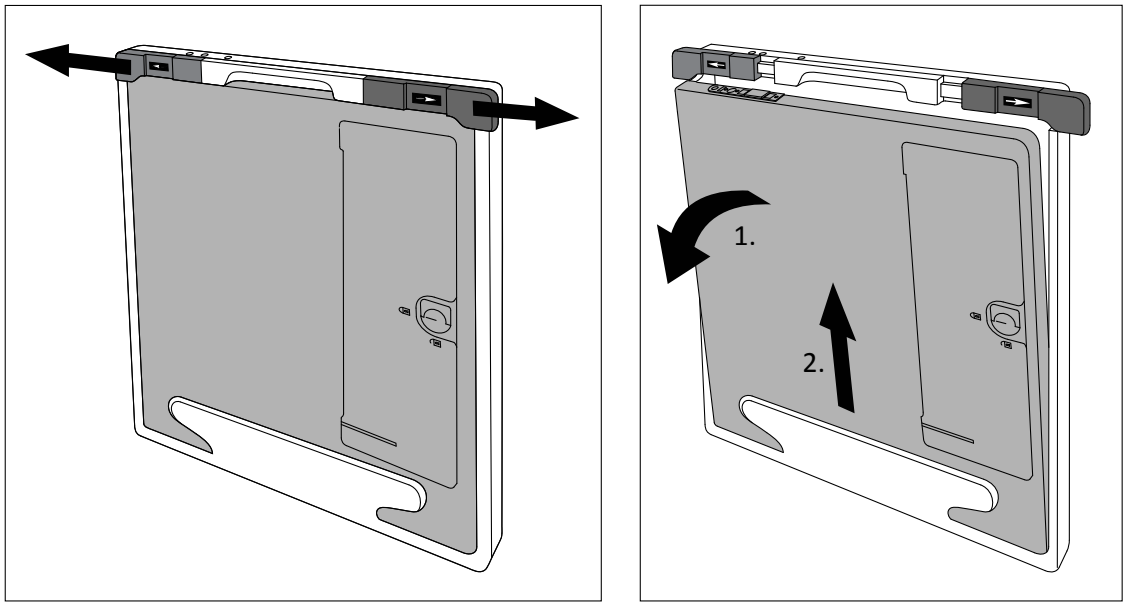

Fig. 28: Removing the Detector from the Grid Frame

The Eleva Workspot detects that there is no grid attached to the detector.

Correct Use of the Grids

WARNING

Risk of interaction between pacemaker and magnets of the grid

If a person (for example, patient, staff) bears a pacemaker, the grid should not be carried or placed with the rear side close to the front of the chest.

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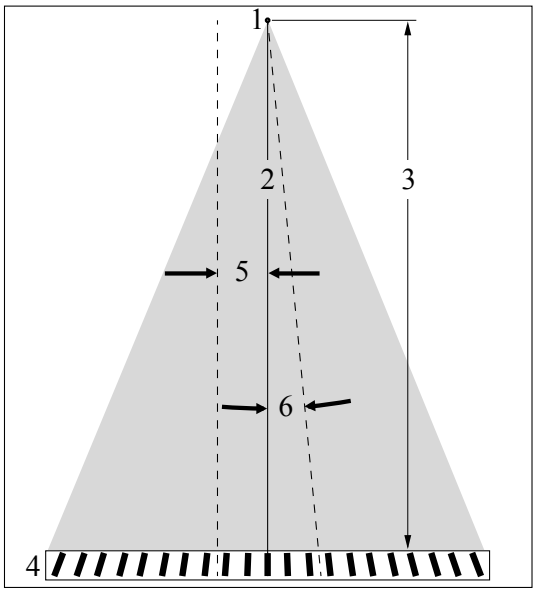
The grid should be placed perpendicular to the central X-ray beam. As the lead strips embedded in the grid are angled towards the focus, make sure the grid is aligned correctly.

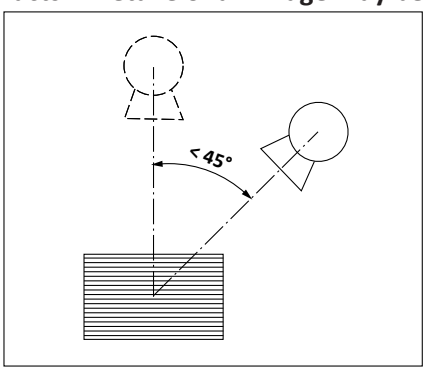


1	Focus
2	Central X-ray beam
3	SID
4	Grid
5	Tolerance of lateral displacement: 7 cm (2.7 in)
6	Tolerance of rotation: 3°

CAUTION

Risk of image artifacts

A detector that is tilted by more than 45° in relation to the X-ray tube can cause image artifacts. A retake of an image may be necessary.



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NOTICE

To avoid gridline artifacts, the central X-ray beam must be over the center gridline. Always move the tube assembly parallel to the direction of the gridlines.

When using a grid with the SkyPlate, the optimal image quality will be achieved at an SID of 130 cm (51.2 in).
However, an SID as shown in the table is tolerable.

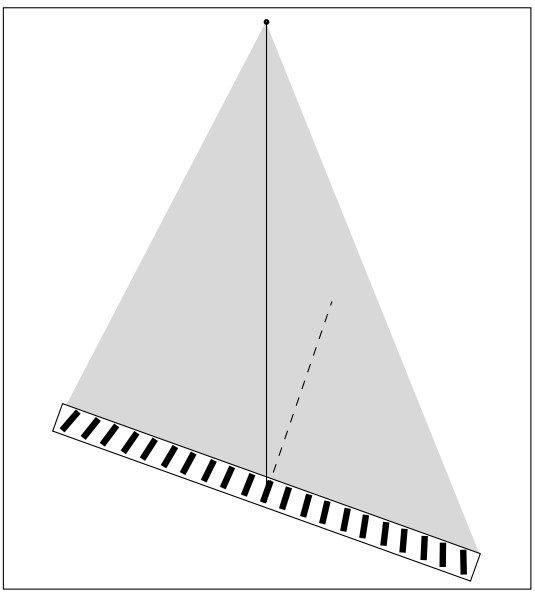
You will receive significant image artifacts if you are not within the SID range:

Grid type	SID	SID range
35 cm × 43 cm landscape (14 in × 17 in)	130 cm (51.2 in)	100 cm to 185 cm (39.4 in to 72.8 in)
35 cm × 43 cm portrait (14 in × 17 in)	130 cm (51.2 in)	96 cm to 203 cm (37.8 in to 79.9 in)
24 cm × 30 cm portrait (10 in × 12 in)	130 cm (51.2 in)	84 cm to 291 cm (33.1 in to 114.6 in)

Incorrect Use of the Grids

Tilted

▷ The detector with the grid attached is tilted so that the immediate central X-ray beam does not meet the grid perpendicularly. Therefore less radiation passes the grid.



► Tilt the detector so that the central X-ray beam meets the grid perpendicularly.

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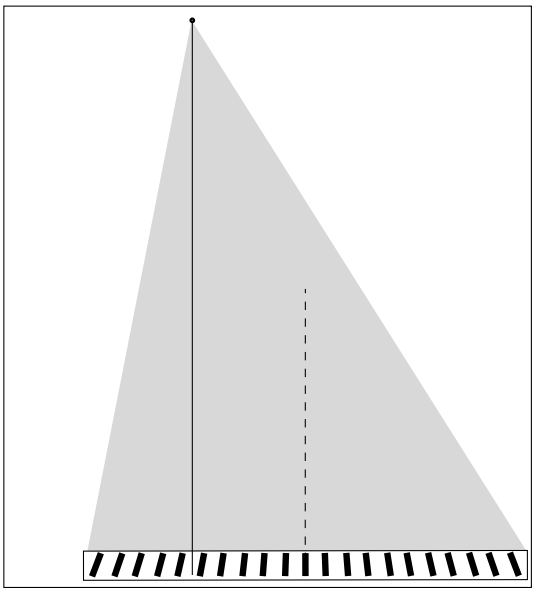
Not Centered

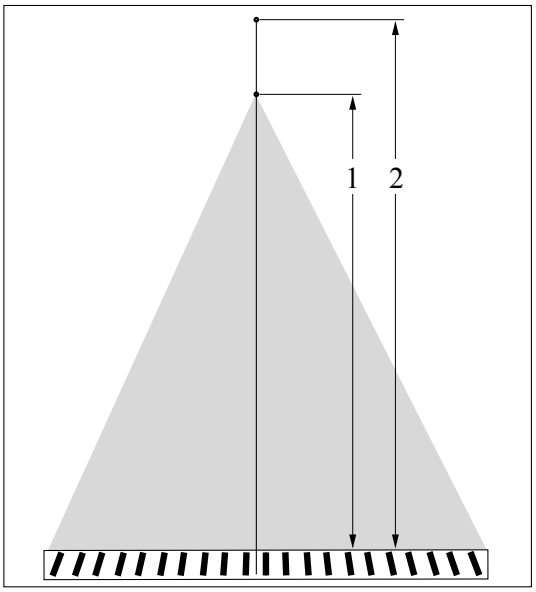
▷ The tube is laterally moved so that the cental X-ray beam does not meet the center of the grid.



► Move the tube laterally so that the central X-ray beam meets the center of the grid.

Wrong SID

▷ The SID (1) set is different from the SID (2) specified for the grid.



► Set the SID to 130 cm (51.2 in).

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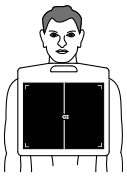
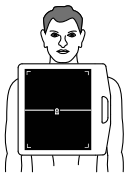
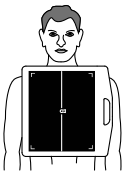
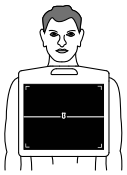
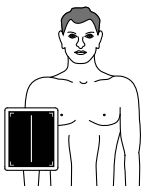
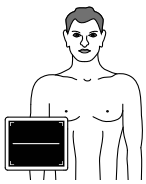
Exposures with the SkyPlate and Grid

Detector 35 cm × 43 cm (14 in × 17 in) with the landscape grid		**Using the landscape grid in landscape orientation** Center line is parallel to the long axis of the patient (for example, for a chest, pelvis, axial hip examination).		**Using the landscape grid in portrait orientation** Center line is perpendicular to the long axis of the patient.
Detector 35 cm × 43 cm (14 in × 17 in) with the portrait grid		**Using the portrait grid in portrait orientation** Center line is parallel to the long axis of the patient (for example, for a chest, pelvis, axial hip examination).		**Using the portrait grid in landscape orientation** Center line is perpendicular to the long axis of the patient.
Detector 24 cm × 30 cm (10 in × 12 in) with the portrait grid		**Using the portrait grid in portrait orientation** Center line is parallel to the long axis of the patient (for example, for an elbow, hand, foot).		**Using the portrait grid in landscape orientation** Center line is perpendicular to the long axis of the patient.
	✓ The X-ray tube assembly can be angled parallel to the patient axis and to the gridlines.		✗ The X-ray tube assembly is angled parallel to the patient axis and with that perpendicular to the gridlines.	
	✗ The detector is tilted to the left/right.		✓ The detector is tilted to the left/right.	
	✗ The X-ray tube assembly is angled to the left/right.		✓ The X-ray tube assembly is angled to the left/right.	

NOTICE

The white line on the grid indicates the direction of the grid lines.

Storing the Grids and Detectors

WARNING

Risk of damage

Use the detector and grid storage only for storing detectors and grids. Do not lean on the detector and grid storage.

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CAUTION

Do not place unused detectors next to the infrared adapter.

Fig. 29: Detector and grid storage

You can store either a grid, a detector, or a grid with installed detector. There are two slots for storing.

Examination

General

Examination Type	Resolution	Remarks
Radiography	High resolution	For static images All images are automatically saved.
Spot exposures	Medium resolution	For documentation of fluoroscopy exams Lower dose than radiography images All spot exposures are automatically saved (single and series exposures).
Fluoroscopy	Low resolution	For live dynamic imaging: continuous or pulsed (fast, medium or slow) You can grab single image or run to save it. You can activate auto grab to save all images.

Stitching (Optional)

Stitching is described in the Instructions for Use for the Eleva Workspot.

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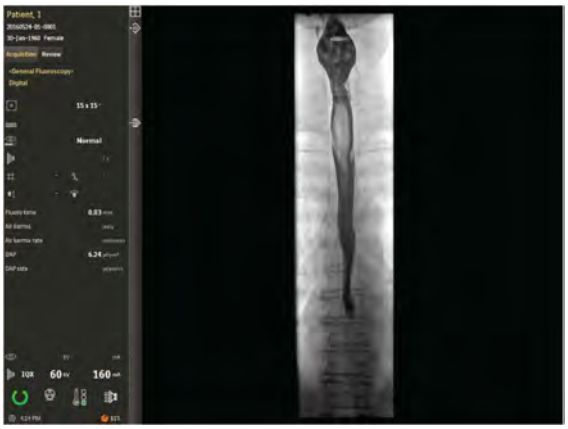
Digital Subtraction Angiography

Digital subtraction angiography is described in the Instructions for Use for the Eleva Workspot.

Preparation at the Eleva Workspot



- ► Select a patient from the Patient list.
- ► Select an examination.
- ► Go to the Examination section.
- ⇨ The first view of the first examination is selected (blue).
- ► Select a registration device.
- ► Select a patient type.
- ⇨ All generator and geometry settings are set to the EPX default.

NOTICE

The settings are set automatically and can be changed due to your needs, for example, filter, grid, AEC on/off, techniques.

- ► Verify the parameters in the generator area.

For Fluoroscopy

- ► Verify the parameters in the generator area, on the control console and on the parameter presetting screen, that pops up, for example:
  - AEC
  - Exposure frame rate
  - Fluoroscopy frame speed
  - Fluoroscopy flavor
  - Zoom level

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- Filters.

Automatic Exposure Control (AEC)

	Automatic exposure control ON	Automatic exposure control OFF *
Exposures with minimal exposure time	kV	kV-mAs
Exposures with constant current	kV-mA	kV-mA-ms or kV-mAs-ms
Exposures with preset exposure time	kV-ms	kV-mAs-ms
IQX	Automatic kV	kV-mA-ms or kV-mAs-ms

* The exposure technique selected when you switch from automatic ON to automatic OFF is defined in the system. This is the default from the system and can be changed manually in the drop down menu on the generator area.

IQX

AEC must be on. IQX is possible for spot exposures only.

For an optimal image quality, the dose is adapted to the thickness of the object within the first milliseconds. This is done by correcting the relevant X-ray parameters during the examination, if necessary.

IQX must be set in the parameters by customer service.

Switching AEC On/Off

► Click this on the Eleva Workspot to switch AEC on.

⇨ The LED lights up green.
Or

► Touch this on the control console.

⇨ The button is framed yellow.

Selecting the Amplimat (AEC) Measuring Field

NOTICE

The measuring field combination can only be selected when the registration device “Table” or “Fluoroscopy” is selected.

Make sure that the anatomy covers the selected measuring fields.

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► Choose the desired measuring field.

Symbol	Meaning	Recommended use
	Small centre field	Used when a smaller measuring field is needed, for example, arthrograms, skull, shoulder, hip.
	Large centre field	Used when a larger center measuring field is needed, for example, stomach. Used for standard fluoroscopy and spot image exposures.
	Upper side fields	Used when the outer two cell are needed, for example, chest, bilateral knees.
	Upper side and centre fields	Used when all three cells are needed, for example, abdomen.
	Middle vertical fields	Used when a vertical slit is needed, for example venograms of a single leg, esophagus examinations.
	Upper and lower side fields	Used when two vertical slits are needed, for example bilateral knees.
	All measuring fields	Used when a large measuring field is needed, for example, barium enema, stomach. Used for standard fluoroscopy and spot image exposures.

Examination with Table

Selecting the Registration Device at the Eleva Workspot

	Select **Fluoro and spot images**.
	Select **Table**.
	Select **Wall stand**.

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	Select **Free cassette**.
	Select **Free detector**.

Positioning the Table and the Patient

- Tilt the table to ±90°, if necessary.
- Adjust the table height, if necessary.
- Position the patient.

WARNING

Risk of injury

Make sure that the patient uses the hand grips mounted. While using the hand grips, the patient will not accidentally reach around the rails of the table. The patient will stand or lie more securely during the examination.

- Adjust the table position.
- Set the SID.
- Collimate the X-ray beam.

Collimation at the Table

To find out how to collimate at the table see chapter “Collimator” on page 103.

Compression

The compressor is applied for examinations of the digestive system.

The cone compresses the body of the patient and stops automatically when the compression force that is set on the control console is reached.

For further information, see chapter “Using the Compressor” on page 107.

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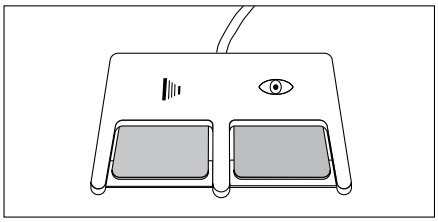
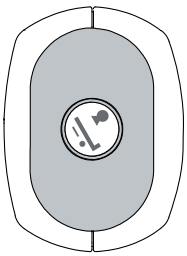
Releasing Fluoroscopy Exposures

You release fluoroscopy and spot exposures with the foot switch.

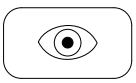


You can release spot exposures with the hand switch as well.



Fluoroscopy Exposures

- Select fluoroscopy settings, for example, fluoroscopy flavor, detector zoom, frame speed.



- Press and hold the right pedal of the foot switch.

  During fluoroscopy, you can change the fluoroscopy settings to your needs.

- If you want to grab a single image, press this on the control console.
  If you press and hold the button, it grabs numerous images.

- If you want to grab every fluoroscopy image (auto grab), select this on the control console screen.

NOTICE

Customer service can program auto grab to be active according to the examination that is selected.

- Release the pedal of the foot switch as soon as you want to stop taking fluoroscopy images.

Spot Exposures

- Select single spot exposure.
  Or

- Select series spot exposures.

- Choose a frame rate.

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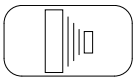
- ► Select fluoroscopy settings, for example, fluoroscopy flavor, detector zoom.



- ► Press and hold the left pedal of the foot switch.
  Or

- ► Press the hand switch down completely.

⇨ All spot exposures are automatically saved.

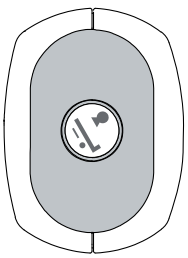
- ► Release the hand switch or the pedal of the foot switch as soon as your desired images have been captured.

NOTICE

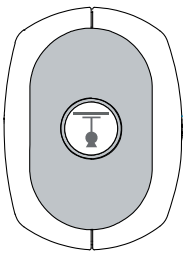
All fluoroscopy images will appear on the RF viewer.

Releasing Radiography Exposures

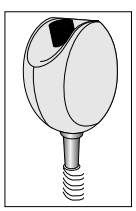
When your system contains a Ceiling Suspension CSM (optional), there is a second hand switch available.



Hand switch for exposures with the X-ray tube of the table.



Hand switch for exposures with the X-ray tube of the Ceiling Suspension CSM (optional).
There might be no icon printed on this hand switch.



- ► Release the exposure in two steps:
  - First step: Preparation (approximately 1 s)
  - Second step: Release the exposure.

  You can press the switch immediately to the second step. There will be a short delay before the exposure is released.

⇨ When the exposure is finished, an audible signal occurs.

⇨ After a few seconds, the preview image appears at the Eleva Workspot.

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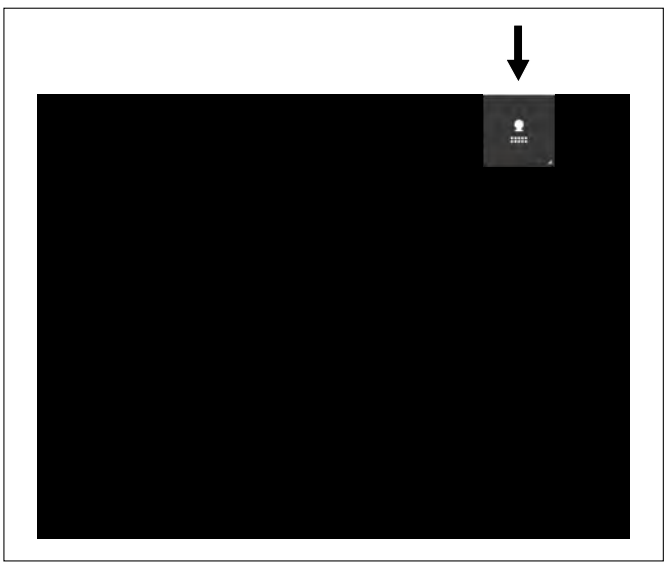
You can check the image quality and the positioning of the patient, and you can adjust the fully post-processed image which is automatically updated after a few more seconds.

Examination with CSM and Wall Stand (Optional)

Selecting the Registration Device at the Eleva Workspot

	Select **Wall stand**.
	Select **Free cassette, other tube**.
	Select **Free detector, other tube**.

Selecting the Registration Device at the Eleva Tube Head



Positioning the Tube Assembly

To find out how to position the tube assembly see chapter “Moving the Tube Assembly with the Control Handle Buttons” on page 120.

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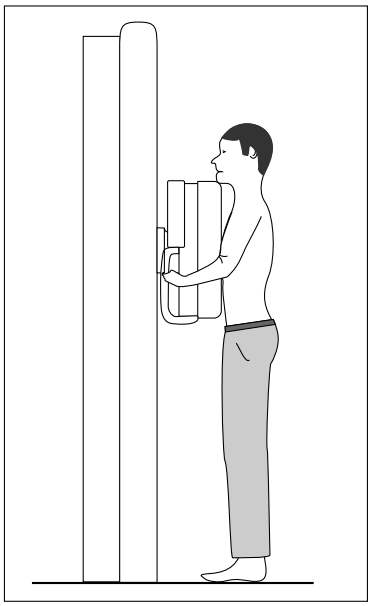
Positioning the Wall Stand and the Patient

Example: Thorax pa



▷ The registration device **Wall stand** is selected.

► Clean the chin rest and front panel.

► Position the patient. To make positioning the patient more comfortable, the patient should use the grips. Adjust height of stretch grip if necessary.

CAUTION

Risk of trapping fingers

When you move the Bucky unit, be sure not to trap the patient's fingers between the grips of the Bucky unit and the holder of the lead apron.

► Swivel the lead apron in front of the patient.

► Move the Bucky unit to the required height.

► Set the source-image distance (SID).

► Align the X-ray tube assembly to the Bucky unit using the light field and, if necessary, the laser.

Releasing Radiography Exposures

When your system contains a ceiling suspension CSM (optional), there is a second hand switch available.

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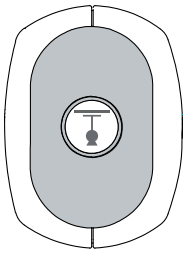
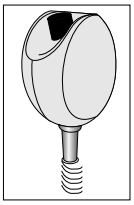


Hand switch for exposures with the X-ray tube of the Ceiling Suspension CSM (optional).
There might be no icon printed on this hand switch.



- ► Release the exposure in two steps:
  - First step: Preparation (approximately 1 s)
  - Second step: Release the exposure.

  You can press the switch immediately to the second step. There will be a short delay before the exposure is released.
- ⇨ When the exposure is finished, an audible signal occurs.
- ⇨ After a few seconds, the review image appears at the Eleva Workspot and at the Eleva Tube Head.

You can check the image quality and the positioning of the patient, and you can adjust the fully post-processed image which is automatically updated after a few more seconds.

NOTICE

Switching the preview image on or off

The preview image appears for 30 seconds at the Eleva Tube Head (default setting). You can switch off the preview image for the current patient in the Examination section of the Eleva Workspot (see the Instructions for Use Eleva Workspot).
Additionally, customer service or the application specialists can change the settings to one of the following:

- Different time interval for the preview image (5 seconds to 1 minute)
- Switch off the preview image permanently

Viewing and Postprocessing of Images

You can process and display the acquired digital images. For radiography images, use the Eleva Workspot. For fluoroscopy and spot images, use the RF Viewer.
For further information, refer to the Instructions for Use of the Eleva Workspot.

Exporting Images and Completing Examinations

Exporting Fluoroscopy Images on the RF Viewer

- ► Click this.

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⇨ All images are exported.

NOTICE

You can flag images that you want to export. Only the flagged images will be exported.

Exporting Radiography Images on the Eleva Workspot

► Reject image. The image is not suitable for diagnosis.
Or

► Confirm image. The image is suitable for diagnosis.

NOTICE

If you turn AutoExport on, you do not have to confirm every single image. As soon as you click **Complete**, all radiography images are exported automatically unless they are rejected.

Completing the Examination

Complete ► Click this to finish the examination.

NOTICE

For further information, see the Instructions for Use of the Eleva Workspot.

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6 Maintenance, Cleaning and Disposal

Maintenance

Planned Maintenance

This product requires proper operation, planned maintenance, and checks the user must perform routinely, which are essential to keep the product operating safely, effectively and reliably.

Planned Maintenance Program

Planned maintenance may be carried out only by qualified and authorized personnel, and is comprehensively described in the service documentation.
Philips provides a full planned maintenance and repair service on both a call basis and a contract basis. Full details are available from your customer service.

When you carry out planned maintenance, you should always take all practical steps to make sure that the Planned Maintenance Program is fully up to date **before** using the product with a patient.

Repairs

X-ray units contain mechanical components which are subjected to wear and tear due to operation.

The correct setting of the electromechanical and electronic assemblies affects the functioning, image quality, mechanical and electrical safety and exposure of the patient and medical personnel to radiation.

Philips recommends the following:

- The tests indicated in the table are performed on a regular basis (see “Tests and Checks by the User”).
- The X-ray unit is serviced by the Philips customer service at least one a year. Heavily used X-ray equipment must be serviced more frequently.

In this way, you avoid endangering the patient and you meet your obligations.

WARNING

Faulty components must be replaced by genuine spare parts.

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Recording Results

Service and repairs must be entered in the medical products logbook, including the following data:

- Type and extent of work
- Details of any changes to ratings or the working zone, if necessary
- Date, person performing the work, signature

User Routine Checks

Obligations of the User

As with any technical appliance this X-ray equipment also requires the following:

- Proper operation
- Regular testing by the user
- Regular service and repair

By taking these preventive actions you maintain the operability and operational reliability of the system. As the user of an X-ray equipment you are obliged to take such precautions – according to accident prevention regulations, the medical products law and other regulations.

WARNING

Maintenance consists of tests which the user can perform and maintenance which is performed under service agreements, customer service orders or by persons explicitly authorised to do so by Philips.

Tests and Checks by the User

WARNING

You must check this device for apparent defects (see table). If operational defects or other deviations from normal operational behavior occur, you must switch off the device and inform the service organization. You may only resume operation of the device after it has been repaired. Operation using faulty components may lead to an increased safety risk.

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Interval	Scope	Method
Acc. to local requirements	Constancy test	
Before every use	Check the wireless portable detector	Visual monitoring
Daily	Faulty display lamps, damaged components, labels, warning signs, oil leaks	Visual monitoring
Daily	Safety switches for device movements (emergency stop switch)	Visual monitoring, acoustic monitoring
Daily	Check ceiling suspension for loose or damaged components or accessories	Visual/manual monitoring
Weekly	Check of all cables and terminals. In case of damage or breakage do not use the system and inform customer service.	Visual monitoring
Weekly	Oil leaks and unusual noises	Visual monitoring, acoustic monitoring
Weekly	Check of the AEC function for radiography and spot images	See the following sections
Weekly	Fluoroscopy dose rate control	See the following sections
Monthly	Dose area product indication for every X-ray tube assembly	See the following sections
Weekly	Skin dose indication	See the following sections
Monthly	Performance check of the automatic collimator	See the following sections
Every 3 months	Image quality evaluation	See Instructions for Use for the Eleva Workspot

NOTICE

Quality control (image quality and radiation dose) should be performed at regular intervals according to local regulations.

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Safety Checks According to the Medical Device Directive

The safety checks cover operability and operational reliability. **They must be performed at least every 2 years.** These checks constitute part of the preventive maintenance under the Philips service agreements.
They cover the following:

- Visual checking for completeness and apparent damage or defects as well as soiling, sticking parts and wear and tear which may affect safety
- Testing the necessary monitoring, safety, display and indicating systems
- Measuring the safety-relevant output parameters
- Checking electrical safety as well as the operability of an internal energy supply
- For the particular product other special technical tests according to the generally accepted standards of engineering practice
- Other necessary tests specified by the manufacturer
- Recording results and filing the test reports in the X-ray system manual (medical products logbook)

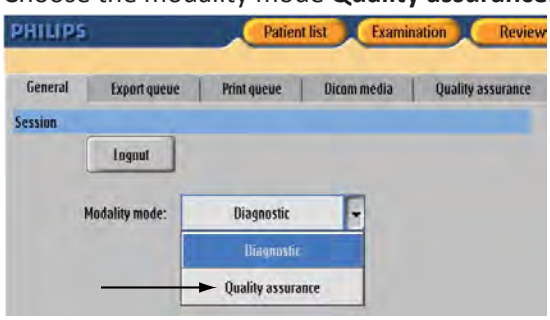
By entering into a service agreement with Philips you retain the value and safety of your X-ray equipment. All the necessary maintenance, including the safety tests for the purpose of preventive avoidance of danger and the necessary settings for optimum image quality and minimum exposure to radiation, are performed at regular intervals. Philips agrees on these intervals with you, taking the legal requirements into account.

Checking the AEC Function

NOTICE

This is a qualitative test to check the basic functionality of the AEC in accordance with IEC 60601-2-54. It is not required that you keep records of the measured data.

- ► Set the SID to 100 cm (39.4 in)
  If you cannot set 100 cm (39.4 in) with the system, use the smallest possible SID.
- ► Go to **General** in the **System** section.
- ► Choose the modality mode **Quality assurance**.



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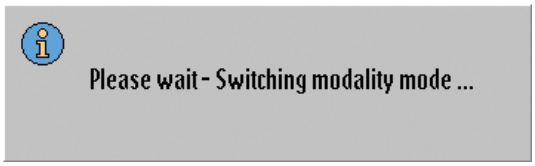
⇨ The following message appears:



⇨ The system switches to the quality assurance mode.

► Go to the **Patient list** section.

► Select the patient **AEC function check**.

► Go to the **Examination** section.

► Select the view **AEC check 1**.

► Release an exposure and note the exposure time.

► Select the view **AEC check 2**.

► Release an exposure and note the exposure time.

► The exposure time of the second exposure must be at least twice as long as the first exposure time.

Checking the Fluoroscopy Dose Rate Control

► Select medium fluoroscopy speed.

► With collimator fully open, release fluoroscopy twice and note the fluoroscopy values.

⇨ The indicated kV must be the minimum programmed value, for example, 40 kV.

► Close the collimator completely.

► Release fluoroscopy twice again and note the fluoroscopy values.

⇨ The indicated kV must be the maximum programmed value, for example, 110 kV or 125 kV.

⇨ There must not occur any error message during this test.

Checking the Dose Area Product Indication

Exposure

► Set exposure parameters: 50 kV, 100 mAs

► Set an SID.

► Collimate.

► Release an exposure and note the following parameters in the table:

- Collimation size
- SID
- Focal spot

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- ► Note the dose area product.
- ► Repeat the test with 100 kV, 100 mAs.

- ► Repeat the test periodically with the same parameters.
- ⇨ The dose area product per kV must be identical.

Test parameters			
Collimation size		_____	
SID [cm]		_____	
X-ray tube assembly - focal spot		_____	
Exposure parameters	50 kV	100 kV	
	100 mAs	100 mAs	
Dose area product	_____	_____	µGy m^2 *

Permissible deviation:	±15% compared with the acceptance test values
* 1 µGy m^2 = 1 cGy cm^2 * 10 µGy m^2 = 1 dGy cm^2	

Checking the Skin Dose Indication

- ► Set the following conditions for continuous fluoroscopy:
  - Full field 43 cm × 43 cm (17 in × 17 in)
  - Normal dose level
  - Minimum SID
- ► Release fluoroscopy for a fixed amount of time, for example, 30 seconds.
- ► Note the indicated value and release fluoroscopy for a second time.
- ⇨ The indicated skin dose should be consistent within ±5%.

For regular routine checks, the permissible deviation is ±15% compared with the acceptance test values.

Performance Check of the Automatic Collimator

This check is to exclude that the collimator, for example, as a result of a defect, is open wider than necessary and permitted, without this having been noticed by the user. In accordance with IEC 60601-2-54, the user must regularly check the proper functioning of the collimator.

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Fluoroscopy

At the Eleva Workspot	► Select registration device for fluoroscopy and spot images.
Preparation at the table	► Select the largest field size. ► Use the automatic collimation (Hand symbol off!). ► Select continuous fluoroscopy.
Fluoroscopy	► Fluoroscopy: Press and hold the pedal of the foot switch ► While fluoroscopy is on, select smallest field size and observe reaction: ⇨ An almost square image field (1) is seen at the center that then quickly opens to the full-size format (2).
Evaluation	If the first image seen is similar to image 1 and then opens completely, the automatic collimation is working correctly.

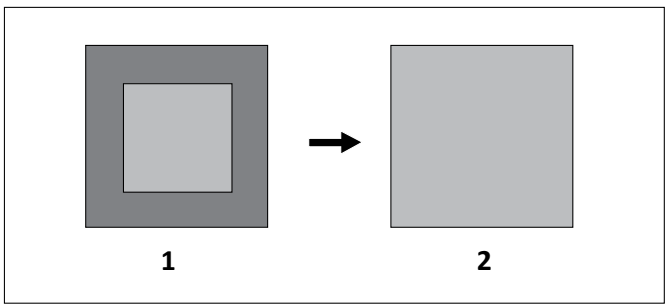

Fig. 30: Functional Test of the Automatic Collimator

Radiography with Ceiling Suspension and Wall Stand

At the Eleva Workspot	► Select the wall stand registration device.
At the wall stand	► Insert the detector into the wall stand Bucky. When you use a fixed detector, skip this step. ► Set the X-ray tube assembly to an SID between 160 cm and 180 cm.
At the Eleva Workspot	► Select a wall stand related view, for example, c-spine.
At the wall stand	► Switch on the light-field indicator. ► Check the area of collimation. ► Set the X-ray tube assembly to an SID of 100 cm. ► Switch on the light-field indicator again. ► Check the area of collimation again.
Evaluation	The area of collimation must remain the same.

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Calibrating the Touch Screen of the Control Console

► Touch this button on the touch screen of the control console.

► Touch **Touchscreen calibration**.

► Touch **Reboot**.

► Wait a few seconds.

⇨ A message appears that the system is rebooting.

⇨ The screen turns black.

⇨ After a few seconds, a message appears that the system is loading.

⇨ After another few seconds, the calibration screen appears.

► Touch the cross at the upper left corner only once firmly, for example, with a pen tip.

► Touch the other three corners in the same way according to the instructions on the screen.

► Wait a few seconds.

⇨ A verification screen appears.

► Touch all four buttons.

⇨ Once you have touched a button, a green mark appears next to the button.

⇨ After a few seconds, the normal operational screen appears.

► Check the proper function of the touch screen by using various buttons.

NOTICE

If the verification of the touch-screen calibration fails, you have to touch all four button on the verification screen again. You may have to repeat this step several times. If the verification of the touch-screen calibration repeatedly fails, the default calibration will be activated.

If the calibration is not possible

If the touchscreen does not react, perform the following:

► Press the emergency button.

⇨ The geometry of the system is switched off.

► Turn the emergency button to the right to perform a reboot.

► Wait until the message appears that the system is loading.

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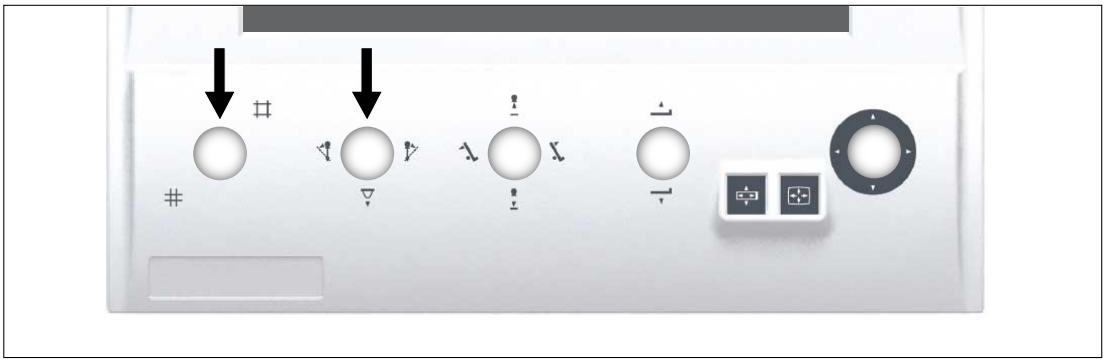
► As soon as the message appears, move down both joysticks on the left side for 2 seconds.



► Wait until the calibration screen appears.

NOTICE

It may happen that the message appears again that the system is loading. Move down both joysticks again and wait until the calibration screen appears.

► Touch the cross at the upper left corner only once firmly, for example, with a pen tip.

► Touch the other three corners in the same way according to the instructions on the screen.

► Wait a few seconds.

⇨ A verification screen appears.

► Touch all four buttons.

⇨ Once you have touched a button, a green mark appears next to the button.

⇨ After a few seconds, the normal operational screen appears.

► Check the proper function of the touch screen by using various buttons.

► If the touch screen does not work properly, try this procedure again. If the touch screen still does not work, call service.

Cleaning and Disinfecting

Rules and Instructions

Cleaning and disinfecting of this product is required periodically. General guidelines for both of them are given below.

Cleaning and disinfecting techniques for both the product and the room must comply with all applicable local laws and regulations. Clean and disinfect the product according to your hospital's policy.

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WARNING

Risk of electric shock

Switch off the system before cleaning or disinfecting to prevent electric shocks.

For quick disinfection of the following parts, it is **not necessary to switch off** the system:

- Table top
- Compression cone
- Wall stand (Vertical stand VS)
  - Patient grip
  - Chin rest
  - Front cover
- Wireless portable detector
- All accessories listed in chapter “Accessories”
- All accessories listed in the Instructions for Use “Eleva Workspot for CombiDiagnost R 90”, chapter “Accessories for Stitching”

WARNING

Never allow water or other liquids to enter the product, since this may cause electrical short circuits or metal corrosion.

Avoiding Contamination

During examinations, protect the equipment by covers and drapes as far as reasonably possible. When you avoid contamination you will minimize the need for cleaning and disinfecting.

Cleaning

- ► Wipe hard surfaces with a soft cloth dampened in a mild soap or detergent solution until all visible signs of surface contaminants are removed. Do not use undiluted detergents.
- ► Remove any remaining cleaning residues with a soft cloth dampened with clean water.
- ► Towel dry with a soft cloth.

NOTICE

Never use corrosive cleaning agents, solvents, abrasive detergents, or abrasive polishes. If you are not sure about the properties of a cleaning agent, do not use it.
Keep dry all electrical contacts and connectors. Wipe around, not over, connector sockets.
Observe the warnings and instructions of the manufacturer of the detergent.

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NOTICE

Though feeling soft, microfiber tissues can be abrasive and may damage plastic and lacquered surfaces.

Disinfecting

All parts of the system that come in contact with the patient should be disinfected after each examination.

WARNING

Risk of explosion

Do not spray any disinfectants directly on the surface.

- ► Clean the surface according to the instructions above.
- ► Wipe the surface with a soft cloth dampened in a recommended disinfectant.
- ► Follow the instructions of the manufacturer of the disinfectant.

WARNING

Detergents and disinfectants, including those used on patients, may create explosive mixtures of gases. Please observe the relevant regulations.

WARNING

Do not use flammable or potentially explosive disinfecting sprays. Such sprays create vapors, which can ignite, causing fatal or other serious personal injury.

CAUTION

Disinfecting a medical product room with sprays is not recommended, since the vapor could penetrate the product, causing electrical short circuits, metal corrosion, or other damage to the product.

If you nevertheless disinfect a medical product room with sprays, do the following:

- ► Disconnect the system from the mains and allow the system to cool down. This prevents convection currents from drawing spray mist into the product.
- ► Cover the product thoroughly with plastic sheeting.
- ► Spray the disinfectant.

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- ► Wait until all traces of the vapor have dispersed.
- ► Remove the plastic sheeting.
- ► Disinfect the system surfaces as recommended above.
- ► Wait until all traces of the vapor have dispersed before switching on the system.

NOTICE

Observe the warnings and instructions of the manufacturer of the disinfectant. If you are not sure about the properties of a disinfectant, do not use it.
Keep dry all electrical contacts and connectors. Wipe around, not over, connector sockets.

You will find special instructions for certain parts in the following sections.

Types of Disinfectants

The following types of disinfectants are suitable for use on nearly all of the equipment surfaces. You will find exceptions for certain surfaces (plastic, metal) in the following table. You will find exceptions for certain components in the following sections.

Type	Ingredients	Notes
Isopropanol	Propan-2-ol, up to 70%	Some **plastics** may be adversely affected by alcohols. For these, an as low as possible alcohol content is preferred.
Alcohol	Mixtures of Ethanol, Propan-1-ol, and Propan-2-ol with water, up to 70% total	
Chlorhexidine	Chlorhexidine gluconate or chloride 0.5% in 70% Ethanol	
Chlorine	250 ppm in water	Concentrations > 500 ppm will adversely affect **metal surfaces** and must not be used on such surfaces.
Quaternary ammonia compounds (QATs)	Didecyldimethylammoniumchloride (DDAC), Benzalkoniumchloride (BAC) or similar, < 1% in water, potentially mixed with Alcohol	QATs and amines remain on surfaces after disinfection; therefore, the residues must be regularly removed by cleaning. Residues may react with some detergents or aldehydes to build a film difficult to remove. Displays may become dull by the residues; therefore, QATs and amines are **not recommended for screens and displays**. **Some plastics may develop cracks when exposed to QATs and amines (see the following chapters for special parts of the system).**

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Type	Ingredients	Notes
Amines, Glucoprotamines	Cocospropylendiamine, Amino-propyl-dodecylamine, or similar, < 1% in water, potentially mixed with Alcohol	
Active oxygen	Stabilized hydrogen peroxide < 1% in water or other oxygen generating substances	The pH should be > 3. Products with a pH close to neutral are preferred. **Metal surfaces** may show increased corrosion when subjected to active oxygen for some time. Therefore, metal surfaces should be wetted only for a period as short as possible. **Not to be used on electrical contacts.**

The following commercially available disinfectants represent such disinfectants (these are just examples). Products available in your country may differ in name and composition. Before applying a certain product, check and compare the declaration of the composition.

Product name	Product type	Active ingredients	Dilution	Notes
Alcohols - for quick disinfection				
Isopropanol	Liquid	Propan-2-ol 70%	not applicable	
Bacillol® Bacillol® AF	Liquid, wipes	Propan-1-ol 450 mg/g, Propan-2-ol 250 mg/g, Ethanol 47 mg/g.	not applicable	
Meliseptol® liquid	Liquid	Propan-1-ol 500 mg/g, Glyoxal 8 mg/g	not applicable	
Pursept®-A Xpress	Liquid, wipes	Ethanol 550 mg/g, N-Alkyl-Aminopropyl-glycin 0.3 mg/g	not applicable	
Incidin® liquid Incides® N	Liquid, wipes	Propan-2-ol 350 mg/g, Propan-1-ol 250 mg/g	not applicable	
Quick disinfectant with low alcohol content - suitable for all surfaces, recommended for sensitive plastic surfaces				
Bacillol® 30	Foam, wipes	Ethanol 140 mg/g, Propan-2-ol 100 mg/g, Propan-1-ol 60 mg/g, N-Alkyl-Amino-propylglycin 5 mg/g	not applicable	
Quaternary ammonium compounds (QATs) - not suitable for all plastic surfaces				

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Product name	Product type	Active ingredients	Dilution	Notes
Sani-cloth® Active	Wipes	Didecyldimethylammoniumchloride 4.5 mg/g	not applicable	
Meliseptol® Foam pure Meliseptol® Wipes sensitive	Foam, wipes	Didecyldimethylammoniumchloride 2.3 mg/g, Propan-1-ol 170 mg/g; Tenside	not applicable	
Microzid® sensitive liquid	Liquid, foam, wipes	Benzyl-C12-16-alkyldimethyl-chloride 2.6 mg/g, Didecyldimethylammoniumchloride 2.6 mg/g, Benzyl-C12-14-Alkyl[(ethylphenyl) methyl]dimethyl-chloride 2.6 mg/g	not applicable	
Microbac® basic	Concentrate	Benzyl-C12-18-alkyldimethyl-chloride 190 mg/g	not applicable	
Microbac® Tissues	Wipes	Benzyl-C12-18-alkyldimethyl-chloride 4 mg/g, Didecyldimethylammoniumchloride 4 mg/g	not applicable	
Amines - not suitable for all plastic surfaces				
Incidin® PLUS	Liquid concentrate	Glucoprotamine 260 mg/g	0.5%–1%	
Combinations QATs and amines - not suitable for all plastic surfaces				
Microbac® forte	Liquid concentrate	Benzyl-C12-18-alkyldimenthyl-ammoniumchloride 199 mg/g, N-(3-Aminopropyl)-N-dodecylpropan-1,3-diamin 50 mg/g	0.5%–1%	
Incidin® Extra N	Liquid concentrate	Benzalkoniumchloride 150 mg/g; Glucoprotamin 124 mg/g	0.5%–1%	

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Product name	Product type	Active ingredients	Dilution	Notes
SURFANIOS Premium	Liquid concentrate	N-(3-Amino-propyl)-N-dodecyl-propan-1,3-diamin 51 mg/g; Didecyldimethylammoniumchloride 25 mg/g	0.25%	
Active oxygen - not suitable for all metal surfaces				
terralin® PAA	2-component liquid concentrate	Peracetic acid	1%–2%	pH 6
perform®	Granulate	Pentapotassium-bis-(peroxymonosulphate)-bis(sulfate) 450 mg/g	0.5%–1%	pH 4
Dismozon® plus	Granulate	Magnesium monoperoxyphthalate hexahydrate 800 mg/g	0.75%–1.5%	pH 5.3
Incidin® active	Granulate	Percarbonate sodium 600 mg/g	1% to 2%	pH neutral
Oxivir® Tb	Spray, wipes	Accelerated hydrogen peroxide 0.5%	not applicable	No pH value given
Carpe Diem™ Tb	Spray, wipes	Accelerated hydrogen peroxide 0.5%	not applicable	No pH value given
Accel® TB	Liquid, wipes	Accelerated hydrogen peroxide 0.5%	not applicable	pH 2.5–3.5 (other source: pH 2)
microzid® PAA	Wipes	Peracetic acid 70 mg/g	not applicable	pH 2.2
Chlorine - not suitable for all metal surfaces				
Clorina®	Powder concentrate	Tosylchloramide sodium 1000 mg/g	0.5%–1.0%	Works on basis of active oxygen plus chlorine

Restrictions for Certain Types of Disinfectants

NOTICE

Some plastics may develop cracks when exposed to QATs or amines.

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Do not disinfect the following components with substances containing **QATs or amines**:

- Remote controls for the wall stands

Do not disinfect the following components with substances containing **amines**:

- SkyPlate
- Battery charger for SkyPlate batteries
- Detector handle for SkyPlate
- Grids for SkyPlate
- Panel protector for SkyPlate
- Stitching stand
- Stitching ruler for fluorosopcy

Special Instructions for Certain Components

Cleaning and Disinfecting the SkyPlate and the Batteries

CAUTION

Risk of artifacts

Make sure that you clean the detector properly. Otherwise you may get artifacts.

NOTICE

If WPD bags are not used, clean the detector after each patient.

NOTICE

Do not use substances that contain amines. When exposed to amines, the SkyPlate may develop cracks.

NOTICE

Do not use substances that contain chlorine dioxide (for example, Difficil-S). When exposed to chlorine dioxide, the SkyPlate may develop cracks.

Make sure that no fluids come into contact with the battery connector.

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Types of Disinfectants for the SkyPlate

To identify your SkyPlate type, check the REF number on the label on the rear side of the SkyPlate (see the following figure).

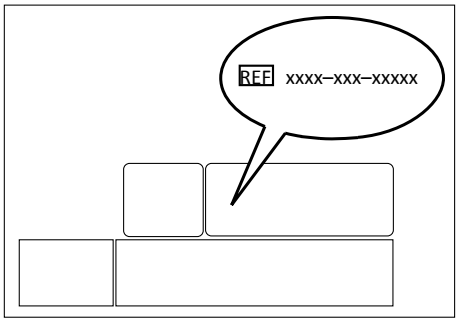

Fig. 31: Position of the REF number (example)

If your SkyPlate detector has one of the following REF numbers, the full table of disinfection agents applies:

- 4512-134-72142
- 4512-134-73302
- 4598-015-74941
- 9897-010-02545
- 9897-010-02556
- 9897-010-02693

For detectors with a REF number that is not listed above, only the agents marked with * in the table are recommended.

The following commercially available disinfectants represent disinfectants that are tested and applicable on SkyPlates. Products available in your country may differ in name and composition. Before applying a certain product, check and compare the declaration of the composition.

Supplier	Product name	Product type	Active ingredients (100 g contains)
–	*IPA	Liquid	–
	Ethanol 70%	Liquid	
Anios	* Surfa'Safe	Spray	Didecyldimethylammonium chloride, Polihexamethylene bisanide hydrochloride
	*Surfanios Premium	Liquid, Wipes	N-(3-aminopropyl)-N-dodecylpropane-1,3-diamine (51 mg/g), Didecyldimethylammonium chloride (25 mg/g)
B. Braun	Meliseptol rapid	Spray, Liquid	Propan-1-ol (50 g), Didecyldimethylammonium chloride (0.075 g)
Bode	Bacillol 30 Tissues	Wipes	Ethanol (140 mg/g); Propan-1-ol (60 mg), Propan-2-ol (100 mg), N-Akyl-aminoproplyglycin (5 mg/g)
	Dismozon plus	Powder	Magnesium monopreoxyphathalat hexahydrat (958 mg/g)

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Supplier	Product name	Product type	Active ingredients (100 g contains)
	Bacillol AF	Liquid	Propan-1-ol (450 mg), Propan-2-ol (250 mg), Ethanol (47 mg/g)
	Mikrobac Tissues	Wipes	Benzyl-C12-18-alkyldimethylammonium chloride (4 mg/g), Didecyldimethylammonium chloride (4 mg/g)
	*Mikrobac forte	–	Benzyl-C12-18-alkyldimethylammonium chloride (199 mg/g), N-(3-Aminopropyl)-N-dodecylpropan-1,3-dia-min (50 mg/g)
Clorox	Bleach Germicidal Wipes	Wipes	Sodium hypochlorite (0.55%), 0.52% available chlorine
Dr. Schumacher	Cleanisept	Liquid	Didecyldimethylammonium chloride (3.33 g), Alkyl (C12-16) dimethylbenzylammonium chloride (6.66 g)
Ecolab	Incidin Pro	Liquid	2-Phenoxyethanol (10.0 g), N (8.0 g), N-bis-(3-Aminopropyl)dodecylamin, Benzalkonium chloride (7.5 g)
	Indicin Active	Powder	1% Incidin Active solution contains: > 600 ppm Peracetic acid
	Incidin Plus	Liquid	Glucoprotamin (26 g)
	Sani-Cloth Active	Wipes	Didecyldimethylammonium chloride (0.45 g)
Lysoform	Lysoformin 3000	Liquid	Glyoxal (7.5 g), Glutaral (9.5 g), Didecyldimethylammonium chloride (9.6 g), Isotridecanol (ethoxyliert)
	Clorina	Granulate	Tosylchloramide sodium (1.0 g)
Metrex	CaviWipes XL	Wipes	Isopropanol (17.2%), Ethylene Glycol Monobutyl Ether (2-Butoxyethanol) (1%–5%), Diisobutylphenoxyethoxyethyl dimethylbenzyl ammonium chloride (0.28%)
	CaviWipes1	Wipes	Isopropanol (15%), Ethanol (7.5%), Ethylene Glycol Monobutyl Ether (2-Butoxyethanol) (1%–5%), Didecyldimethylammonium chloride (0.76%)
PDI	Sani-Cloth AF3	Wipes	Quaternary ammonium compounds, C12-18-alkyl [(ethylphenyl) methyl] dimethyl, Chlorides (0.14%), Benzyl-C12-18-alkyldimethyl ammonium chlorides (0.14%)
	*Super Sani-Cloth	Wipes	Isopropyl alcohol (55.5%), Quaternary ammonium compounds, C12-18-alkyl [(ethylphenyl) methyl] dimethyl, Chlorides (0.25%), n-Alkyl dimethyl Benzyl ammonium chloride (0.25%)

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Supplier	Product name	Product type	Active ingredients (100 g contains)
	Sani-Cloth Plus	Wipes	Isopropanol (10-20%), 2-Butoxyethanol 2 (<5%), Quaternary ammonium compounds, C12-18-alkyl[(ethylphenyl)methyl]dimethyl, Chlorides (0.125%), Benzyl-C12-18-alkyldimethylammonium chlorides (0.125%)
	Sani-Cloth Bleach	Wipes	Sodium hypochlorite (0.63%)
Schuelke	mikrozid sensitive wipes	Wipes	0.26 g Alkyl(C12-16)dimethylbenzylammonium chloride (ADBAC/BKC (C12-16)) (0.26 g), Didecyldimethylammonium chloride (DDAC) (0.26 g), Alkyl(C12-14)ethylbenzylammonium chloride (ADEBAC (C12-C14)) (0.26 g)
	terralin protect	Liquid	Alkyl(C12-16)dimethylbenzylammonium chloride (ADBAC/ BKC (C12-16)) (22 g), 2-Phenoxyethanol (17 g), Amine (0.9 g)
	*mikrozid AF wipes	Liquid	Ethanol (94%) (25 g), Propan-1-ol (35 g)
	perform	Granulate	Pentapotassium-bis-(peroxymonosulphate) bis(sulphate) (45 g)
	mikrozid PAA wipes	Wipes	Peracetic acid (0.06%), Further ingredients: Hydrogen peroxide, Acetic acid

Cleaning the Touch Screen

Cleaning

WARNING

Switch off the system before cleaning the front glass.

You can use any standard glass cleaner to clean the touch screen.

- ► Spray the glass cleaner on a cloth or towel.
- ► Wipe the touch screen.

NOTICE

If the glass cleaner is sprayed directly on the touch screen, it may leak inside the touch screen and cause damage.

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If there are liquid drops on the touch screen, the touch screen may not react properly when touched.

Dirt and fingerprints do not affect the operation of the touch screen.

Disinfecting

You can use all types of disinfectants described in chapter “Types of Disinfectants” on page 210.

Cleaning the Mattress

NOTICE

Do not expose the mattress to chlorine based detergents.

Product Disposal

Philips is committed to protecting the natural environment, and ensuring continued safe and effective use of this product through proper support, maintenance and training. Therefore Philips products are designed and manufactured to comply with relevant guidelines for environmental protection. As long as the product is used and maintained properly, it presents no environmental risks. However, the product may contain materials which could be harmful to the environment if disposed of incorrectly. Use of such materials is essential for the product's functions and its compliance to the statutory and other requirements.

Final Disposal of the Product

Final disposal is when the user disposes of the product in such a way that it can no longer be used for its intended purposes.

The return, proper disposal and recovery of the medical device take place in accordance to the European WEEE Directive (Waste Electrical and Electronic Equipment) and/or to the respective requirements of national legislation.

Philips manufactures state-of-the-art medical equipment in terms of safety and environmental protection. Assuming no parts of the system housing are opened and the system is used properly, there are no risks to people or the environment.

CAUTION

Do not dispose of any parts of this product as industrial or domestic waste. The product contains hazardous materials which require special disposal. Incorrect disposal of any of these materials may lead to serious environmental pollution.

Philips supports you in the following:

- Recovery of reusable parts (for example, detector, workstation, X-ray tube).

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- Recycling of useful materials by competent disposal companies.
- Safe and effective disposal of the product. For advice and information, contact customer service first or the manufacturer.

For more information on the Product Recycling Passport go to:
http://www.philips.com/recycling

Passing the Product on to Another User

If this product is passed to another user, it must be in its complete state, including all product support documentation.
Make the new user aware of the support services that Philips provides for installing, commissioning and maintaining the product.

Before passing on the product or taking it out of service, all patient data must be (backed up elsewhere if necessary, and) deleted from the product.

Disk Sanitization

The system is not equipped with a special-purpose disk sanitization software. In order to achieve disk sanitization in a way that meets your security or privacy requirements, consult your local IT department and consider one or more of the following actions:

- Physically destroy the system's build in disk considering standard documents like NIST SP800-88.
- Mount the system's disk into a regular PC for use of the “ATA Secure Erase” feature of the BIOS.
- Engage a Philips service engineer to install the system disk from scratch. By performing a from-scratch installation, all disk partitions are overwritten with the default partition images, that means all former Bitlocker KeyProtectors are replaced and the entire encrypted partition is re-encrypted with new cryptographic keys. The service tool displays the encryption progress, which should reach 100% to complete the sanitization.
- If applicable, destroy or invalidate any existing recovery password.

It must be remembered by all existing users that passing on medical electrical products to new users may create serious technical, medical and legal (for example, privacy) risks. Such risks can arise even if the product is given away. Existing users are strongly advised to seek advice from their local Philips Medical Systems representative before committing themselves to passing on any product. Alternatively, they may contact the manufacturer.

Once the product has been passed on to a new user, a previous user may still receive important safety-related information, such as bulletins and field change orders. In many jurisdictions, there is a clear duty on the previous user to communicate such safety-related information to new users. Previous users who are not able or prepared to do this should inform Philips about the new user, so that Philips can provide the new user with safety-related information.

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Replacing and Disposal of Batteries

For safe operation, replace the batteries of the remote control for the RF viewer at regular intervals.

Replacing the Batteries

- ► Unscrew the three screws using a Phillips screwdriver to open the battery compartment cover on the rear side of the remote control.
- ► Remove the old batteries.
- ► Insert new batteries type AA in the position indicated in the battery compartment.
- ► Fasten the three screws using a Phillips screwdriver to close the battery compartment cover.

Disposal of Batteries

- ► Dispose of the batteries according to the local environmental regulations.

REACH Requirements

REACH requires Philips to provide chemical content information for Substances of Very High Concern (SVHC) if they are present above 0.1% of the product weight. Components within electric and electronic equipment may contain phthalates above the threshold, for example, bis(2-ethylhexyl)phthalate, CAS no. 117-81-7). The SVHC list is updated on a regular basis. Please refer to the following Philips REACH website for the most up-to-date list of products containing SVHC above the threshold: http://www.philips.com/about/sustainability/reach.page

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7 Technical Data

Ambient Conditions

In Operation

Component	Temperature	Relative humidity	Air pressure
Basic unit	+10°C to +40°C (50°F to 104°F)	30% to 75%	700 hPa to 1,060 hPa
Monitor supports			
Remote control for RF viewer			
Dynamic detector in table	+15°C to +35°C full performance ** (40°C functional) (59°F to 95°F (104°F))	20% to 75%	700 hPa to 1,060 hPa
Wall stand	+10°C to +40°C (50°F to 104°F)	20% to 80%	700 hPa to 1,060 hPa
Fixed detector in wall stand	+15°C to +35°C (59°F to 95°F) full performance ** to 40°C functional (104°F)	20% to 75%	700 hPa to 1,060 hPa
Ceiling suspension CSM	+10°C to +40°C (50°F to 104°F)	20% to 80%	700 hPa to 1,100 hPa
Portable detector	+10°C to +35°C* (50°F to 95°F)	20% to 80%	700 hPa to 1,060 hPa
Battery for portable detector	+10°C to +35°C (50°F to 95°F)	max. 95%, non-condensing	700 hPa to 1,100 hPa
Battery charger	0°C to +50°C (32°F to 122°F)	max. 95%, non-condensing	700 hPa to 1,100 hPa
Grids for portable detector	+10°C to +35°C (50°F to 95°F)	20% to 75%, non-condensing	700 hPa to 1,060 hPa
Bar code scanner	0°C to +50°C (32°F to 122°F)	0 to 95%, non-condensing	-

* +40°C for small SkyPlate in incubator

** Full performance: Temperature range for optimal image quality

Based on the component restrictions, the following overall environmental conditions are derived for optimal performance.

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Room temperature range	+15°C to +35°C (59°F to 95°F)
Air humidity range	30% to 75%
Air pressure range	700 hPa to 1060 hPa
Max. installation height	3,000 m
Max. air oxygen	The system is not designed for environments with increased oxygen content.

Oxygen Enrichment

Portable detector only: up to 100%

In Transport and Storage

Temperature	Relative humidity	Air pressure
–25°C to +70°C (–13°F to 158°F)	5% to 95%	700 hPa to 1,100 hPa

Table

Power Supply

General Data	
Mains voltage	380/400 V ±10%, 3-phase
Mains frequency	50 Hz/60 Hz
Max. power consumption	7 A @380/400 V

Basic Unit

Mechanical Data	
Weight	1,350 kg (2,976 lb)
Vertical table height	2,500 mm (98.4 in)
Horizontal table height and max. SID	3,480 mm (137 in)
Total width completely retracted	1,920 mm (75.6 in)
Length (horizontal table)	2,420 mm (95.3 in)
Total length with +90 /-90 max SID	5,560 mm (218.9 in)
Minimum height from the floor	650 mm (25.6 in)

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Max. patient weight with all movements	284 kg (626.1 lb)
Distance X-ray field centre – table head extremity	440 mm (17.3 in)
Distance X-ray field centre – table feet extremity	440 mm (17.3 in)
Table top to detector distance	125 mm (4.9 in)
Minimum distance Compression cone – table top	100 mm ±10 mm (4.3 in ±0.4 in)
Maximum distance Compression cone – table top	350 mm ±10 mm (13.8 in ±0.4 in)
Compression force	Adjustable from 3 kg (6.6 lb) to 15 kg (33.1 lb) with step of 0.5 kg (1.1 lb)
Electrical cabinet containing all the electrical and electronic control parts	520 mm x 550 mm x 1950 mm (20.4 in x 21.6 in x 76.8 in)
Table Top	
Dimension	2,356 mm x 738 mm (92.8 in x 29.0 in)
Dimension of the radio-transparent zone	2,214 mm x 554 mm (87.2 in x 21.8 in)
Attenuation equivalent	≤ 0.6 mm Al, 100 kV/HVL 3.6 mm Al according to IEC 60601-2-54
Movement Range	
Tilting	±90°
Lift	680 mm (26.8 in)
Longitudinal table top movement	Fixed
Transversal table top movement	320 mm (12.6 in)
Longitudinal column movement	1,480 mm (58.3 in)
Source-image distance (SID)	113 - 183 cm (43.5 in - 72.1 in)
Angulation	±40°
Compressor (run of the cone in X-ray beam)	250 mm (9.8 in)
Tube rotation	+180°, -90°
Speed	
Tilting	Slow 4.5°/s
	Fast 6.5°/s
Lift	29 mm/s (1.1 in/s)
Transversal table top	50 mm/s (2 in/s) ± 0%
Longitudinal table	172 mm/s (6.8 in/s) (maximum) with acceleration step for small or large movements at table tilt angle < ±35° 86 mm/s (3.4 in/s) at table tilt angle > ±35°

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Source image distance (SID)	Selectable between two fixed values:
	32 mm/s (1.3 in/s) ±10%
	41 mm/s (1.6 in/s) ±10% (default)
Angulation	11.2°/s
Compressor	60 mm/s (2.4 in/s)

Filtration	
Permanent filtration of X-ray tube assembly	Min. 2.5 mm Al/75 kV (IEC 60522)
Quality equivalent filtration of beam limiting device	See technical data of collimator

Electrical cabinet	Contains all electrical and electronic control parts
Measurements	520 mm + rear panel 160 mm x 550 mm x 1,950 mm (20.5 in + 6.3 in x 21.7 in x 76.8 in)
Weight	222 kg (490 lb)

Grids

Grid 1	Strip frequency (N)	44 lp/cm
	Grid ratio (r)	12:1
	Focusing distance (f_0)	120 cm
Grid 2	Strip frequency (N)	44 lp/cm
	Grid ratio (r)	12:1
	Focusing distance (f_0)	180 cm
Grid 1 (optional)	Strip frequency (N)	44 lp/cm
	Grid ratio (r)	8:1
	Focusing distance (f_0)	120 cm
Grid 2 (optional)	Strip frequency (N)	44 lp/cm
	Grid ratio (r)	8:1
	Focusing distance (f_0)	180 cm

Application Limits [cm]

If the focal point-grid distance lies within the limits given in the table, acceptable image quality can usually be obtained.

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Ratio 8:1			Image size		
f_0	18 cm	24 cm	30 cm	36 cm	43 cm
120 cm	72 – 360	80 – 240	86 – 200	90 – 180	94 – 166
180 cm	90 – ...	103 – 720	113 – 450	120 – 360	127 – 310

Ratio 12:1			Image size		
f_0	18 cm	24 cm	30 cm	36 cm	43 cm
120 cm	83 – 216	90 – 180	95 – 164	98 – 154	101 – 147
180 cm	108 – 540	120 – 360	129 – 300	135 – 270	141 – 250

If a grid is selected, the system moves a grid into the beam path. There are two grids available (f_0 = 120 cm and f_0 = 180 cm). The system selects the grid automatically depending on the SID.
When you increase the SID, the grid changes at 147 cm.
When you decrease the SID, the grid changes at 143 cm.

Collimator

Collimation	Automatically with light field indicator, multilayer, square field Manual via joystick on the control console and buttons on the collimator
Collimator with 2 axes	Rectangular and square
Light field indicator	Single power LED With timer: 30 s (default) to 45 s or with requested turn-off
Quality equivalent filtration	Min. 0.3 mm Al, 75 kV/HVL 2.7 mm Al (IEC 60601-1-3)
Leakage radiation	Measured according to IEC 60601-2-54 at 100 cm (39.4 in), with 150 kV, 4 mA: <0.35 mGy/h (40 mR/h)
Additional filtration	0.1 mm Cu + 1 mm Al (3.8 mm Al equivalent)
	0.2 mm Cu + 1 mm Al (6.5 mm Al equivalent)
	1.5 mm Cu (for system calibration)
Rotation	±45°

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Weight	9.5 kg (20.9 lb)
Accessories	Rails for accessories

Dynamic Detector

Type		Digital CsI (Cesium lodide) flat detector
Detector size		43 cm × 43 cm (17 in × 17 in)
Active area		420 mm × 425 mm (16.5 in × 16.8 in)
Active image matrix size		2,880 × 2,881 pixel
Usable image matrix size		2,840 pixel × 2,874 pixel
Pixel size	Radiography mode	Max. 148 µm
	Fluoroscopy mode	Max. 444 µm
Image resolution		Up to 3.4 Lp/mm

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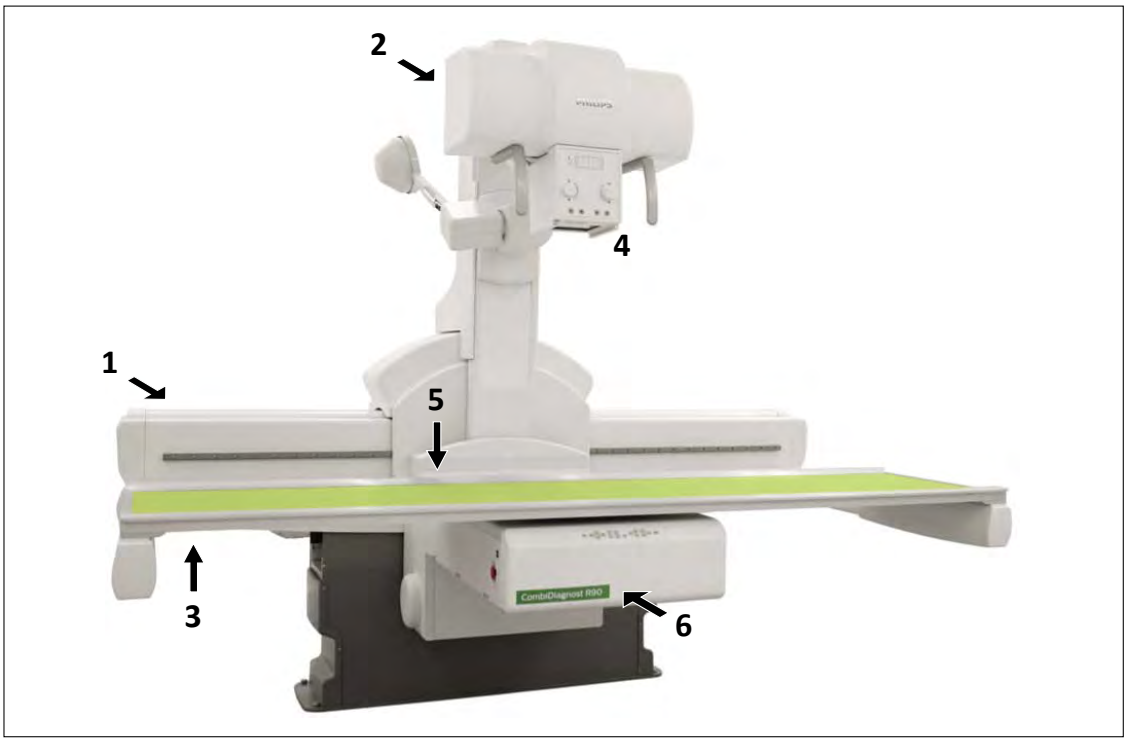
Labels



No.	Label	No.	Contents
1	Table labels (left column) and system labels (right column) (A) (B) (C) (D) (E) (F) (G)	A	Component label with technical data
		B	Table data
		C	Country-specific information (USA)
		D	System label
		E	Technical data of the generator
		F	Grid data (Grid 1 and 2)
		G	Country-specific product label
2	(A) (B)	A	Spare part label
		B	Component label
3			Component label

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No.	Label	No.	Contents
4	Collimator labels (A) (B)	A	Component label with technical data
		B	FDA compliance statement (for USA)
			LED radiation warning
5			Component label
6			System name
Not shown	Foot switch (rear side):		Component label

Control Console

Equipment Data

Dimensions	357 mm x 355 mm x 110 mm (14.1 in x 14 in x 4.3 in)
Weight	5.4 kg (11.9 lb)

Labels

Label	Contents
	Component label

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X-Ray Generator

Electrical Data

Electrical data		Velara 65 kW	Velara 80 kW
Safety class		I	I
EMC emission (IEC 60601-1-2/CISPR 11)		Group I / Class B	Group I / Class B
Energy supply		380 V - 480 V ± 10%, 50 Hz and 60 Hz, 3-phase	
Mains resistance/max. input current 380 V		≤ 0.2 Ω /185 A	≤ 0.15 Ω /228 A
Mains resistance/max. input current 400 V		≤ 0.25 Ω /176 A	≤ 0.2 Ω /220 A
Mains resistance/max. input current 480 V		≤ 0.35 Ω /142 A	≤ 0.3 Ω /178 A
Max. current input is reached under these conditions.	Generator power	65 kW	80 kW
	Technique	kV-mAs	kV-mAs
	Focal spot	large	large
	High voltage	72 kV	72 kV
	mAs product	90 mAs	110 mAs
	Exposure time	0.1 s	0.1 s
Electrical output according to IEC 60601-2-7, IEC 60601-2-54			
Exposure	Max. voltage	150 kV	150 kV
	Nominal electrical power	65 kW (100 kV, 0.1 sec)	80 kW (100 kV, 0.1 sec)
	Maximum electrical output	65 kW	80 kW
		900 mA at 72 kV	1100 mA at 72 kV
		812 mA at 80 kV	1000 mA at 80 kV
		650 mA at 100 kV	800 mA at 100 kV
		520 mA at 125 kV	640 mA at 125 kV
		433 mA at 150 kV	533 mA at 150 kV
Fluoroscopy	Max. voltage / current	125 kV / 30 mA	125 kV / 30 mA
Continuous output (for a typical combination of fluoroscopy and radiography)		700 W	700 W
High-voltage generation		Converter	Converter
Ripple		DC voltage	DC voltage
Classification according to Medical Device Directive 93/42/EEC-IIb.			

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Exposure Techniques

- kV, continuously falling load, automatic exposure control (one-factor technique)
- kV-mA, direct current technique, automatic exposure control (two-factor technique)
- IQX, automatic exposure control with pulsed control of kV and mA
- kV-mAs, constant load (two-factor technique)
- kV-mAs-ms, constant load (three-factor technique)

Setting Ranges

Setting ranges		Velara 65 kW	Velara 80 kW
Radiography without automatic exposure control	Tube voltage	40 kV to 150 kV adjustable in steps of 1 kV or according to a sequence the steps of which roughly correspond to an exposure increment *****. In the case of tubes with lower maximum voltage this is limited accordingly.	
	Tube current	For kV-mA-s and kV-mAs techniques this can be set at increments of 25%*****, 12% or 6%.	
		1 mA to 900 mA	1 mA to 1,100 mA
	mAs	1.4 mAs ****** to 850 mAs, can be set at increments of 25%*****, 12% or 6%. Correspondence range according to IEC 60601-2-7, IEC 60601-2-54	
	Exposure time	1.0 ms to 4 s can be set at increments of 12% or 6%	
Radiography technique with automatic exposure control	mAs	0.5 mAs to 600 mAs	
	Exposure time	2.9 ms to 4 s	
	Nominal shortest irradiation time	2.9 ms	
	Exposure correction	can be set in increments of 12%***** or 6%	
Continuous fluoroscopy	Tube voltage	40 kV to 125 kV, via kV/mA characteristics (can be restricted to 110 kV dependent on customization)	
	Tube current	0.2 mA to 30 mA, via kV/mA characteristics	
Pulsed Controlled Fluoroscopy (PCF) with X-ray tube assembly SRO 33100 ROT 380	Tube current	1.5 mA to 60 mA	
	Tube voltage	40 kV to 125 kV (can be restricted to 110 kV dependent on customization)	
Grid Controlled Fluoroscopy (GCF) with X-ray tube assembly SRM 0608 ROT-GS 505	Tube current	1.5 mA to 200 mA	
	Tube voltage	40 kV to 110 kV	

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Setting ranges	Velara 65 kW	Velara 80 kW
* Default values: ±25% mAs corresponds to ±1 exposure increment ±12% mAs corresponds to ±0.5 exposure increment		
** Smaller values available through service programming (not IEC)		

Accuracy of the Operating Data

Compliance

Compliance with the requirements of IEC 60601-2-7, IEC 60601-2-54 with application of the IEC test conditions.

Request	Compliance
Exposure	
Reproducibility of emitted radiation	Is maintained
Linearity of emitted radiation:	
In relation to current time product assuming consecutive settings or settings with a factor of ≥2	In the range ≥2 mAs over the entire range of settings
Consistency of emitted radiation during automatic exposure control	Is maintained
Accuracy of the X-ray tube load factors:	
- Tube voltage	Is maintained
- Tube current	Is maintained
- Tube load time	Is maintained
- Current-time product	Is maintained
- Current-time reference product	Is maintained

Current-time reference product

Reference value for the compliance range of linearity of the emitted radiation.
This table applies to tubes with x-ray generator nominal power and an exposure time of 100 ms at 100 kV. For tubes with a lower focal spot power the current-time reference product has to be converted accordingly.

Current-time reference product				
	50 kW	65 kW	80 kW	100 kW
70 kV, 350 mA	35 mAs			
70 kV, 450 mA		45 mAs		
70 kV, 500 mA			50 mAs	
70 kV, 600 mA				60 mAs

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Current-time reference product				
100 kV, 250 mA	25 mAs			
100 kV, 320 mA		32 mAs		
100 kV, 400 mA			40 mAs	
100 kV, 500 mA				50 mAs
150 kV, 150 mA	15 mAs			
150 kV, 200 mA		20 mAs		
150 kV, 250 mA			25 mAs	
150 kV, 320 mA				32 mAs

Compatibility

You can operate the Philips Velara RF generator with the following X-ray tubes from Philips. Mixed operation is possible.

- SRO 33100 ROT 380
- SRM 0608 ROT-GS 505.

For further information about additional connectable tubes, contact the Philips customer service.

Classifications

- Classification according to type of protection against electrical shock: Safety class I.
- Classification according to degree of protection against electrical shock: not classified
- Classification according to degree of protection against penetration of water: no special requirements.
- Classification according to the degree of protection when used in the presence of flammable mixtures of anesthetics and air or oxygen or laughing gas: not suitable.
- Classification according to mode of operation: suited for continuous operation with intermittent loading (standby - fluoroscopy - exposure).
- Cooling system: Air ventilation.

NOTICE

Make sure that the ventilation openings in the generator control cabinet are not covered during operation.

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Weight

Generator with X-ray tube assembly	Maximum weight of generator
SRO 33100 ROT 380	314 kg (692.3 lb)
SRM 0608 ROT-GS 505	338 kg (745.2) including grid switch tank

Labels

Generator Control Cabinet

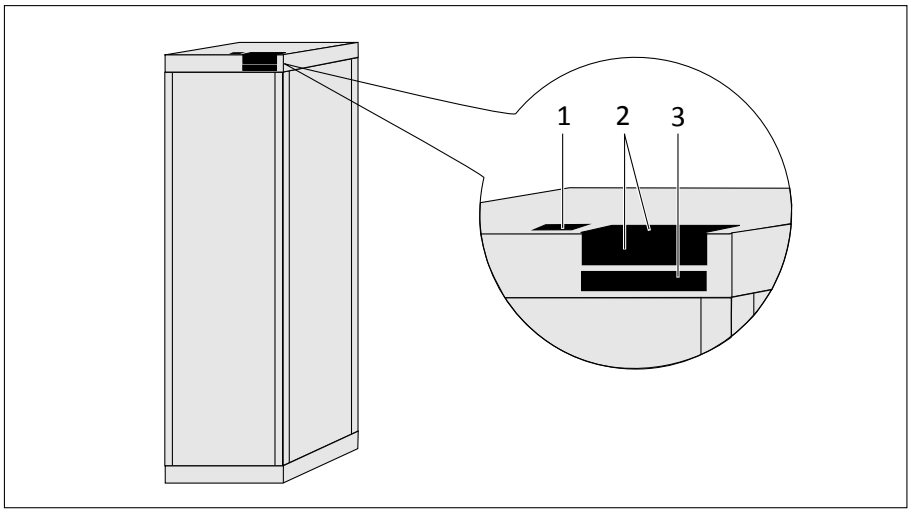

Fig. 32: Location of the labels on the generator control cabinet

No.	Label	Contents
1		Component data
2		Component label
3		Technical data

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M-Cabinet RF

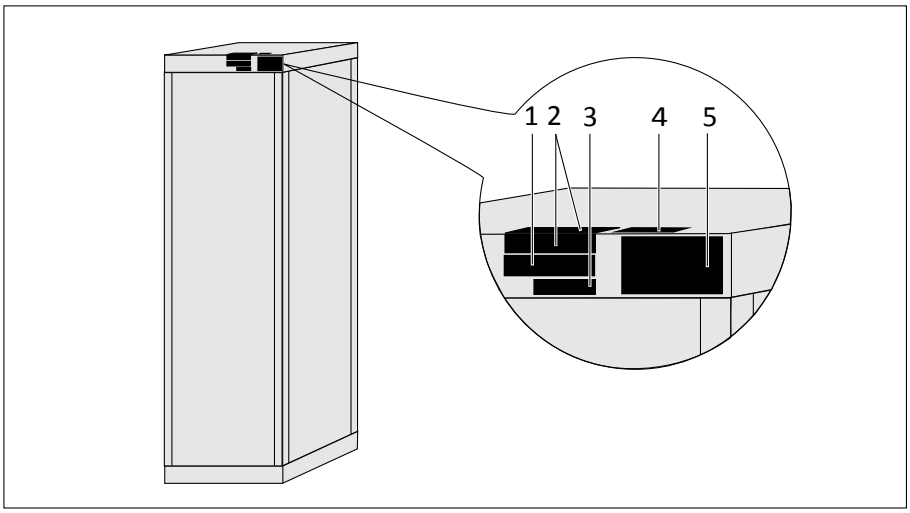

Fig. 33: Location of the labels on the M-cabinet RF

No.	Label	Contents
1		Component label
2		Manufacturer’s address
3		License label
4		CSA
5		Technical data

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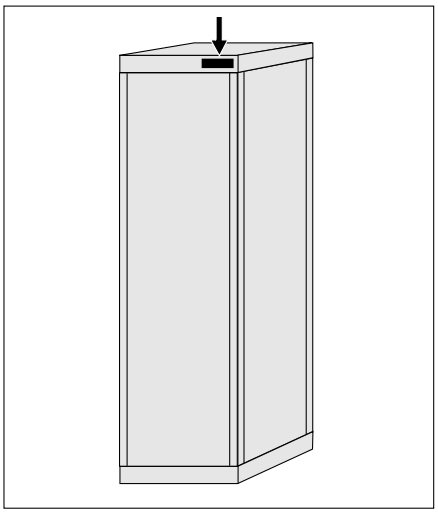
R-Cabinet



Label	Contents
	Component label

X-Ray Tube Assembly

For technical data of the X-ray tube assembly, refer to the separate Instructions for Use.

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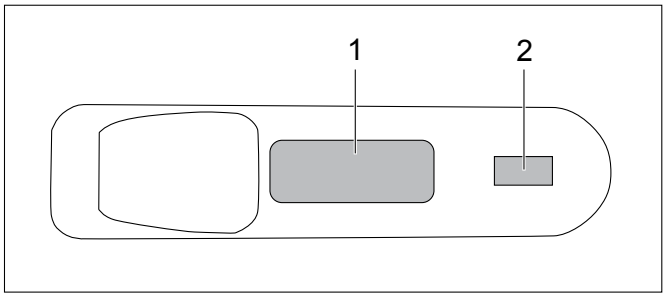
Remote Control for RF Viewer

Labels



No.	Meaning
1	Component label
2	Laser class

Ceiling Suspension CSM

Equipment Data

Ranges of movement	
longitudinal	3,410 mm (134.3 in)
– with extension	6,140 mm (241.7 in)
transverse	1,490 mm (58.7 in), short version 3,210 mm (126.4 in), long version
vertical	≥ 1,650 mm (65 in), max. 1,705 mm (67.1 in)
Range of X-ray tube assembly rotation round the	
– vertical axis	±180°, lock-in position every 45°
– horizontal axis	±115°, lock-in position at 0°, ±90°
Collimator	Automatic Stepless adjustment according to IEC 60601-2-54
Quality equivalent filtration	Min. 0.1 mm Al, 75 kV/HVL 2.7 mm Al (IEC 60601-1-3)
Leakage radiation	≤ 0.374 mGy/h at 150 kV, 1.18 mA and 100 cm (39.4 in) SID
Rotation	±45°

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SID measuring range	70 cm – 300 cm (27.6 in – 118.1 in) with automatic collimation
Timer switch for light field indicator	Programmable In accordance with IEC 60601-2-54 the timer ensures that the lamp switches off automatically in less than 2 minutes to prevent over-heating of the collimator.
Timer switch for laser	Programmable
Added filter	0.1 mm Cu + 1 mm Al (3.8 mm Al equivalent) 0.2 mm Cu + 1 mm Al (6.5 mm Al equivalent) 0.5 mm Cu + 2 mm Al (only for detector calibration)
Collimator rails for filters and accessories	The accessories must have a width of 170 mm (6.7 in) (nominal).
Permanent filtration of X-ray tube assembly	Min. 2.5 mm Al/75 kV (IEC 60522)
Maximum symmetrical radiation field	430 mm × 430 mm (16.9 in × 16.9 in) at a distance of 1000 mm (39.4 in) from the focal spot according to IEC 60806
Minimum selectable radiation field	≤ 5 cm × ≤ 5 cm in a plane orthogonal to the X-ray beam axis at a distance of 1 m from the focal spot according to IEC 60601-2-54
Weight of Ceiling Suspension CSM	Max. 310 kg (683 lb), depending on configuration

Compatibility

Generators

- Velara

System components

- X-ray tube housing ROT 380
- Collimator with light field indicator, motorized
- Lock-in positions for longitudinal and transverse movement
- Touch-screen display for exposure parameters in examination room

System options

- Cassette size sensing in combination with automatic collimation
- Tracking in combination with automatic collimation
- Live camera

Accessories for tube carriers

- Rails for cable carrier BuckyDiagnost CS III
- Cable carrier BuckyDiagnost CS III
- Rail extension

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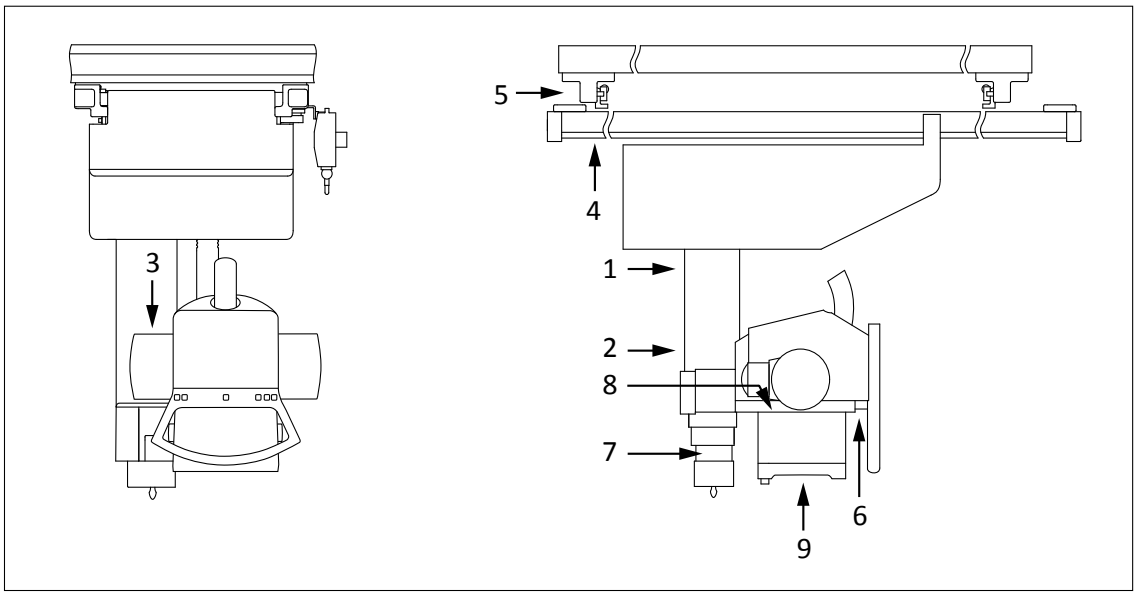
Labels



No.	Labels	No.	Contents
1	Telescope carriage		Component label
2	CSM	A	Component label with technical data
3	X-ray tube assembly		Component label with technical data
4	Longitudinal carriage		Component label
5	Ceiling rails		Component label

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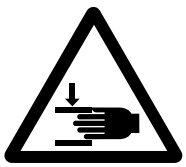
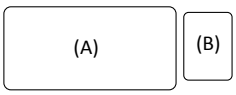
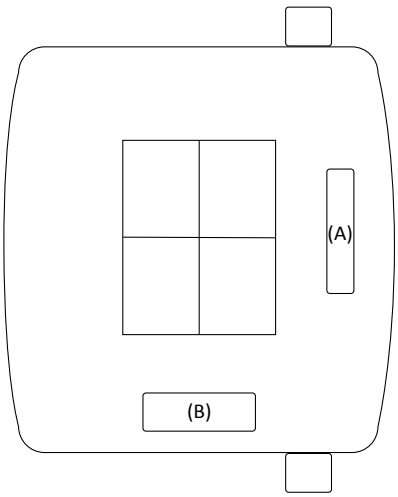
No.	Labels	No.	Contents
6	Control handle 		Component label
7			Risk of trapping fingers
8	Collimator 	A	Component label with technical data
		B	FDA compliance statement (for USA)
9	Collimator 	A	Laser aperture close/open
		B	Laser radiation warning

Wall Stand

Equipment Data

Front panel, dimensions (H × W)	575 mm × 596 mm (22.6 in × 23.4 in)
Distance between front panel and detector plane	54 mm (2.1 in)
Al equivalent	< 0.65 mm
Basic unit	
• Height	208 cm (81.9 in)

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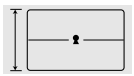
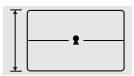
• Vertical travel	30–180 cm (11.8–70.9 in), measured at center of detector
• Front panel vertical lower position (center of image receptor)	30 cm (11.8 in)
• Front panel horizontal lower position	54.2 cm (21.3 in)
• Tilt angle	−20° to +90°
Weight	130–255 kg, depending on version
Maximum load on tilted detector	30 kg Philips recommends 10 kg for normal operation (pediatric exposures, hands, feet, etc.)
Collision force	< 200 N
Frequency of remote control	2400 MHz

Application Limits for Grids in the Bucky Unit [cm]

If the focal point-grid distance lies within the limits given in the table, acceptable image quality can usually be obtained.

Ratio 8:1			**Image size** 		
f_0	**18 cm**	**24 cm**	**30 cm**	**36 cm**	**43 cm**
110 cm	68 – 283	75 – 203	80 – 174	84 – 158	88 – 148
140 cm	79 – 630	88 – 336	95 – 263	101 – 229	106 – 208
180 cm	90 – ...	103 – 720	113 – 450	120 – 360	127 – 310

Ratio 12:1			**Image size** 		
f_0	**18 cm**	**24 cm**	**30 cm**	**36 cm**	**43 cm**
110 cm	78 – 186	84 – 158	88 – 146	91 – 138	94 – 133
140 cm	92 – 291	101 – 229	107 – 203	111 – 189	115 – 179
180 cm	108 – 540	120 – 360	129 – 300	135 – 270	141 – 250

Compatibility

Generators 65 kW, 80 kW

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Compatible optional accessories

Only the accessories listed here are approved by Philips.

- Spacer
- Stretch grip
- Babix holder
- Remote control
- Remote control holder

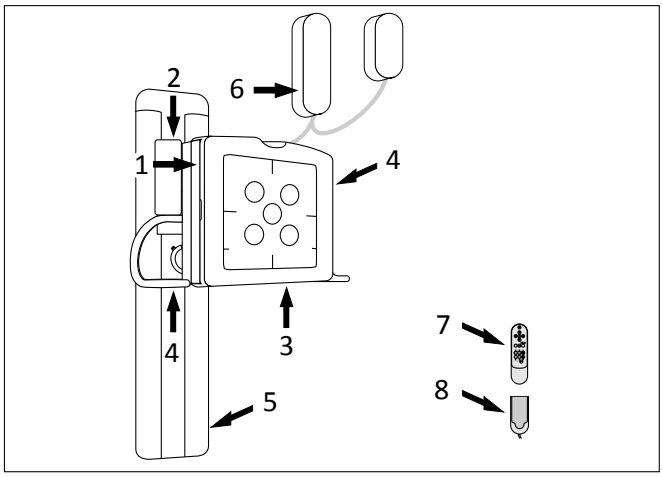
Options

Floor attachment for installation anywhere in the room

System options

Tracking in combination with automatic collimation

Labels



The system is put together according to the customer's requirements, so the labels shown are only samples.

No.	Labels	No.	Contents
1	Bucky unit 		Component label
2			Do not sit on the horizontal detector.

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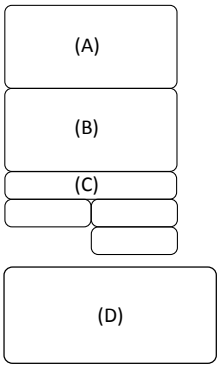
No.	Labels	No.	Contents
3	Vertical module 		Component label
4	Tilting module 		Component label
5	Column 		Component label
6	Wall stand control unit 	A	Country-specific product label
		B	Component label
		C	FDA compliance statement (for USA)
		D	Warning
7	Remote control 		Component label
8	Charging station (remote control charger and power supply) 		Component label

Fixed Detector in the Bucky Unit

Type	Digital CsI (Cesium Iodide) flat detector
Detector size	43 cm × 43 cm (17 in × 17 in)
Active area	min. 42 cm × 42.5 cm (16.5 in × 16.7 in)

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Image matrix size	min. 2,840 pixel × 2,874 pixel
Detector pixels	min. 8.2 Megapixel
Pixel size	max. 148 µm
Image resolution	up to 3.4 Lp/mm
Weight	11.7 kg ± 0.850 kg (25.8 lb ± 1.9 lb)

Grids in the Bucky Unit

Changeable Grids and Usable SIDs for the Bucky Unit

Color	Strip frequency N [cm^{-1}]	Ratio R	Focusing distance f_0 [cm (in)]	SID range on the label [cm (in)]	Recommended SID range [cm (in)] *
Purple	40	8	110 (43.3)	88–147 (35–58)	99–136 (39–54)
Yellow	40	8	140 (55.1)	106–207 (42–81)	119–189 (47–74)
Dark blue	40	8	180 (70.9)	127–309 (50–122)	143–276 (56–109)
Red	40	12	110 (43.3)	94–132 (37–52)	106–124 (42–49)
Light blue	40	12	140 (55.1)	116–178 (46–70)	129–165 (51–65)
Green	40	12	180 (70.9)	141–249 (56–98)	157–228 (62–90)

* The recommended SID range takes account of the following:

- Performance criteria for anti-scatter grids defined by IEC 60627
- Characteristics of the anti-scatter grid type
- Movement of the anti-scatter grid during exposure
- Geometry of the equipment

Selecting the Appropriate Anti-Scatter Grid

Consider the recommended SID range when selecting the appropriate anti-scatter grid. With increasing deviations from the recommended SID range, the overall image brightness may become increasingly inconsistent and will gradually change towards the edges of the image.

Correct Use of the Grids

For more information, refer to the chapter “Correct Use of the Grids”.

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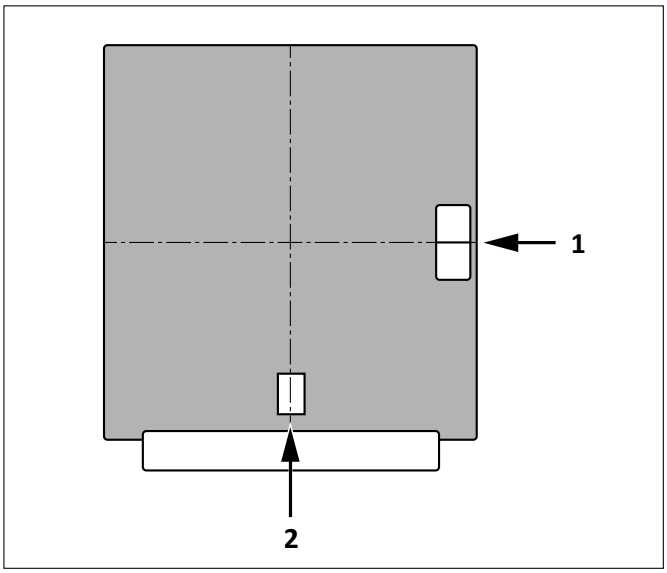
Labels



No.	Label	Contents
1		Accessory label
2		Fragile, handle with care

SkyPlate

SkyPlate

SkyPlate only to be used for radiography images.

Cassette-sized wireless portable detector		
Type	Electronic flat detector made of CsI (Cesium Iodine)	
Detector 35 cm × 43 cm (14 in × 17 in)	Dimensions (W × H × D)	384 mm × 460 mm × 16 mm (15.1 in × 18.1 in × 0.63 in)
	Active detector area (W × H)	345 mm × 421 mm (13.6 in × 16.6 in)
	Image matrix size	2330 pixel × 2846 pixel
	Pixel size	148 µm

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	Image resolution	3.38 Lp/mm
	Detector lag/timing	<1% after 60 s
	Weight (including battery)	2.8 kg (6.2 lb)
Detector 24 cm × 30 cm (10 in × 12 in)	Dimensions (W × H × D)	328 mm × 268 mm × 16 mm (12.9 in × 10.6 in × 0.63 in)
	Active detector area (W × H)	284 mm × 222 mm (11.2 in × 8.7 in)
	Image matrix size	1500 pixel × 1920 pixel
	Pixel size	148 µm
	Image resolution	3.38 Lp/mm
	Detector lag/timing	<1% after 60 s
	Weight (including battery)	1.6 kg (3.5 lb)
Maximum load	100 kg (220 lb) for standing patients	
	300 kg (661 lb) for distributed load, for example, chest examination in bed	
Battery charging time empty to full	4 h max. for 100% charge	
Battery operating time	Autonomy operation mode	typically 6.5 hours (1,050 images)
	Autonomy listen mode	typically 11.7 hours (without image acquisition)
Wireless network standard	IEEE 802.11a, b, g, n	
Wireless security standard	WPA/WPA2 with pre-shard keys (PSK)	
Battery charger		
Dimension (W × H × D)	322 mm × 172 mm × 48 mm (12.7 in × 6.8 in × 1.9 in)	
Weight	1.1 kg (2.4 lb)	
Max. input current	5 A	
Max. input power	60 W	
Mains voltage	110 VAC/230 VAC±10%	
Mains frequency	50 Hz/60 Hz	

Small SkyPlate in Incubator

Environmental Specification	
Temperature	Max. 40°C (104°F)

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Oxygen enrichment	Max. 100%
Rel. humidity	Max. 80%

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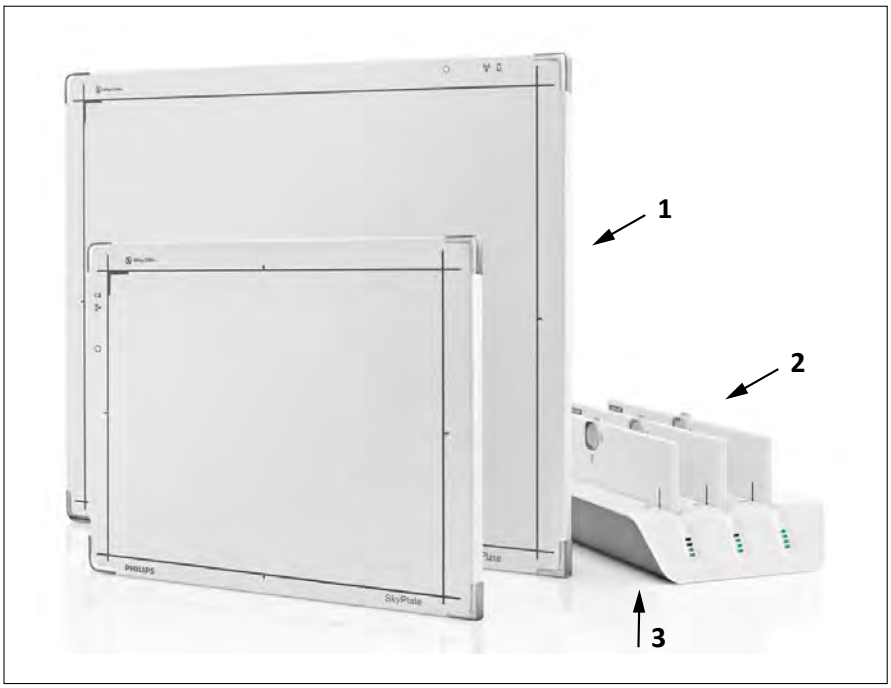
Labels

Detector and Battery Charger



No.			Contents
1	Rear side of detector (A) (B) (C) (D)	A	Unique device identifier
		B	Accessory label
		C	Accessory identification
		D	Accessory data
2	Rear side (printed and glued on battery)		Identification and technical data
3	Rear side of battery charger		Identification and technical data
	Rear side of power supply of battery charger		Identification and technical data

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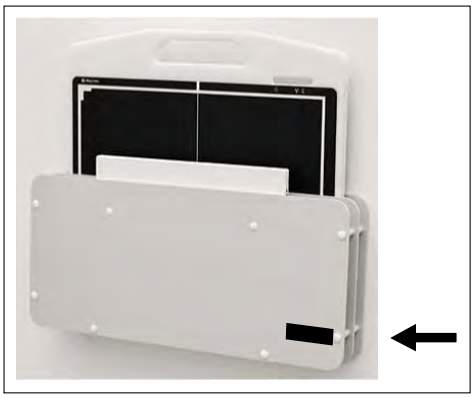
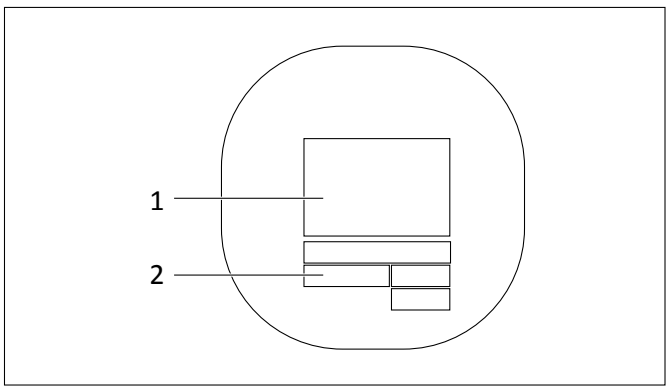
Detector and Grid Storage



Label	Meaning
	Component label

Access Point



No.	Label	Meaning
1		Component label
2		Component data
Not shown		Front side: Serial number and MAC address (can be removed)

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IR Adapter

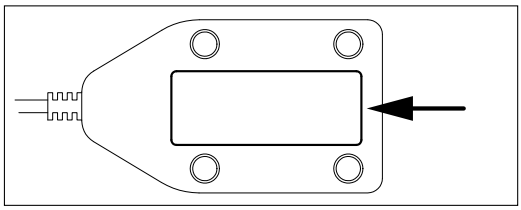
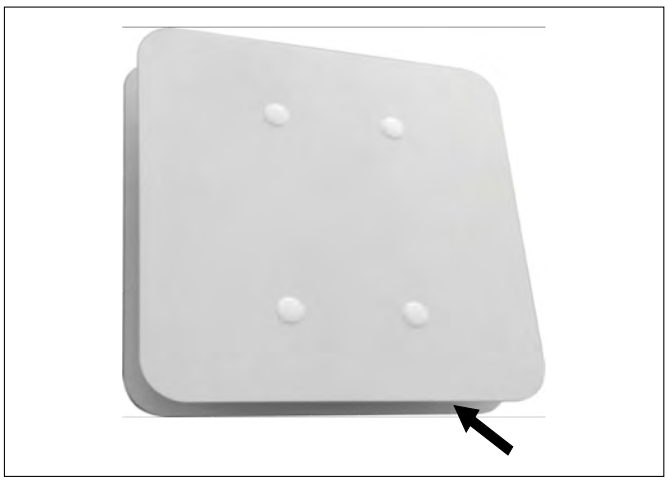


Fig. 34: Label at the bottom

Label	Content
	Identification

Holder for Backup Cable



Label	Meaning
	Component label

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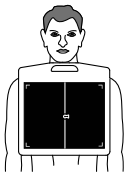
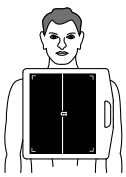
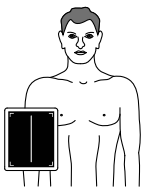
Grids for the SkyPlate

Changeable Grid Frames and Usable SIDs

Orientation		Lp/cm (Lp/in)	Ratio	f_0 [cm (in)]	SID range [cm (in)]
Landscape with detector 35 cm × 43 cm (14 in × 17 in)		40* (101.6*)	8	130 (51.2)	100-185 (39.4-72.8)
Portrait with detector 35 cm × 43 cm (14 in × 17 in)		44* (111.8*)	8	130 (51.2)	96-203 (37.8-79.9)
Portrait with detector 24 cm × 30 cm (10 in × 12 in)		40* (101.6*)	8	130 (51.2)	84-291 (33.1-114.6)

* The Eleva software provides a gridline suppression algorithm.

Maximum load: 100 kg (220 lb)

Technical Data

Small grid		
	Dimensions	280 mm × 354 mm × 25 mm (11 in × 14 in × 1 in)
	Weight	1 kg (2.2 lb)
Large grid		
	Dimensions	468 mm × 476 mm × 25 mm (18.4 in × 18.8 in × 1 in)
	Weight	2 kg (4.4 lb)

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Labels

Grid

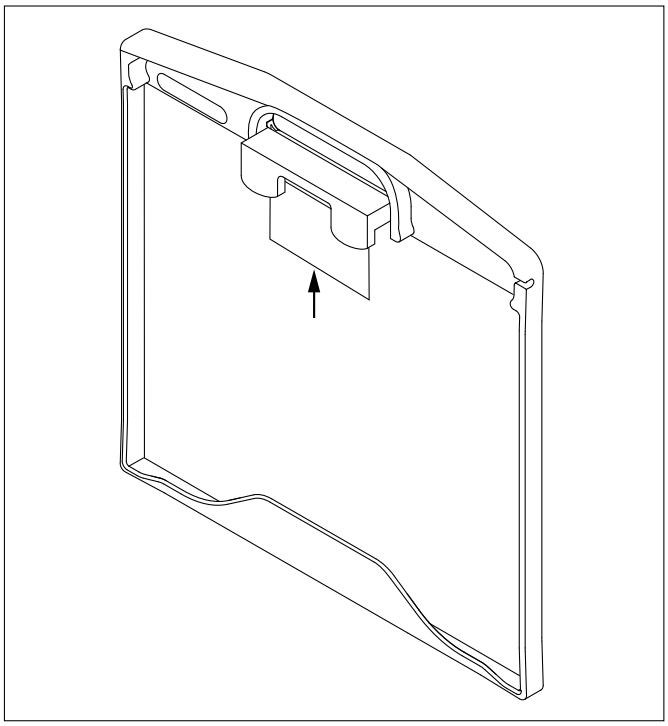

Fig. 35: Label at the Large Grid

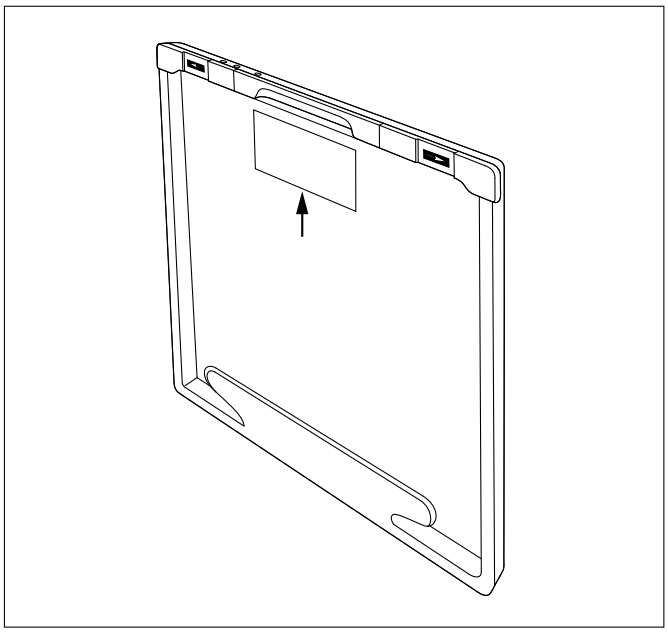

Fig. 36: Label at the Small Grid

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Label	Meaning
	Accessory label

Patient Dose Calculation and Display

The generator area displays the cumulative dose area product (DAP), that means the sum of all exposures of one examination.

The cumulative dose area product is displayed in μGym^2.
1 μGym^2 = 1 $cGycm^2$
10 μGym^2 = 1 $dGycm^2$

The unit for the DAP display can be configured to your needs. The following values are possible:

- $\mu Gym^2/mGym^2$
  dynamic unit starting with μGym^2 up to 9999.99 μGym^2, then changing to $mGym^2$ (starting with 10.00 $mGym^2$)
- μGym^2
- $mGycm^2$
- $cGycm^2$
- $dGycm^2$
- $Gycm^2$

The basic unit of the Dose Area Product (DAP) according to IEC standards is Gym^2 with appropriate prefixes. Therefore, the default setting is μGym^2. The selection of the first setting with the automatic change from μGym^2 to $mGym^2$ activates the common system behavior.

Configuring the DAP unit as it is displayed in the system user interface does not have any impact on the DAP unit that is sent with the DICOM export (always $dGycm^2$) and on the DAP unit in the QA tool.

NOTICE

The configuration of the DAP unit also affects the displayed values for DAP rate.

This medical equipment meets the requirements of IEC 60601-2-54.

	Overall uncertainty
Cumulative dose area product	≤ 35% for values above 5 μGym^2
Dose area product	≤ 25%

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	Overall uncertainty
Reference air kerma rate	≤ 35% for values above 6 mGy/min
Cumulative reference air kerma rate	≤ 35% for values above 100 mGy

Patient Entrance Reference Point

The following locations are taken as reference for calculating patient entrance dose and patient entrance dose rate:

Table	30 cm above table top
Wall stand Bucky tray	30 cm before wall Bucky tray
Free cassette Free detector	30 cm before the cassette or detector

Detector Dose Indication

In accordance with IEC 60601-2-54, the variation of the Exposure Index EI_s in automatic mode for constant X-ray tube voltage and constant thickness of the irradiated object does not exceed 20%.

Automatic Control System for Fluoroscopy

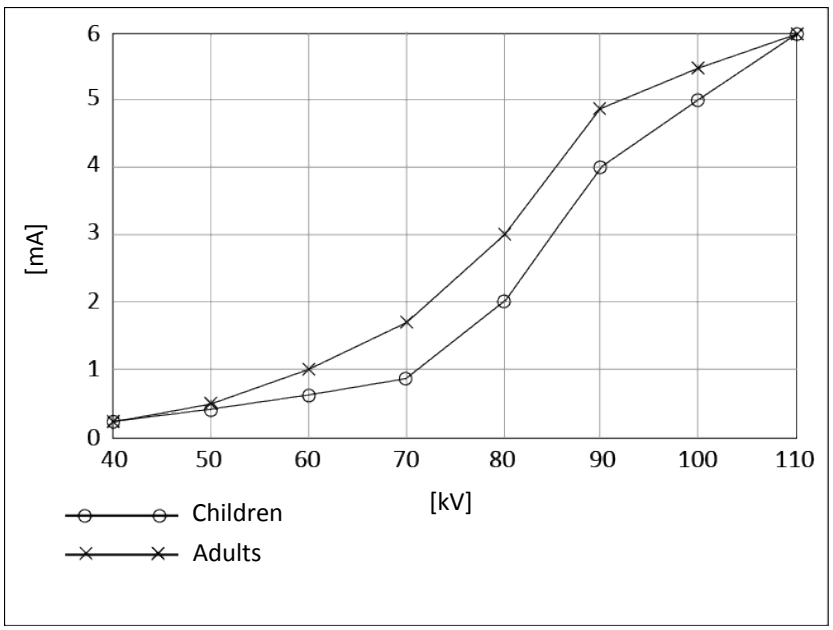

Fig. 37: Continuous fluoroscopy kV-mA curves

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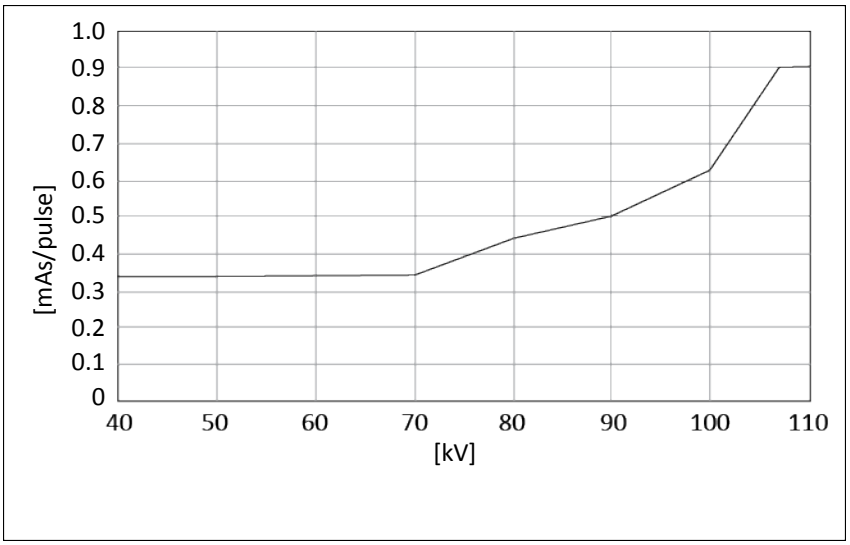

Fig. 38: Pulse-controlled fluoroscopy (PCF) kV-mAs curve

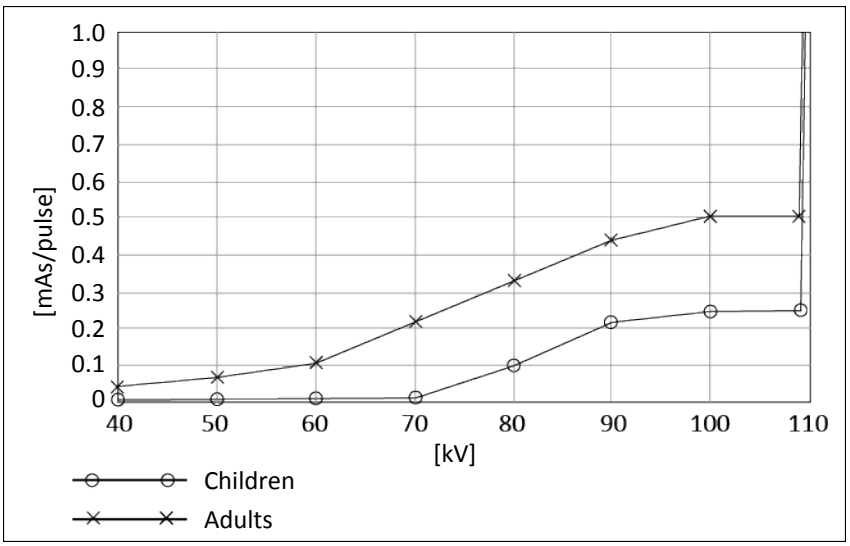

Fig. 39: Grid-controlled fluoroscopy (GCF) kV-mAs curves

Accuracy of the Automatic Control System

Variation in the mean linearized data does not exceed 20% for constant X-ray tube voltage and constant thickness of the irradiated object.

Electromagnetic Compatibility (EMC) Data

Guidance and Manufacturer's Declaration

This X-ray equipment is compliant with 60601-1-2, Ed. 3.0 and Ed. 4.0.

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Electromagnetic Emissions

This X-ray equipment is suitable for a professional healthcare facility environment. The compliance group and class are specified in the table below. The customer or the user of the X-ray equipment should assure that it is used in such an environment.

NOTICE

The emissions characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.

Emissions test	Compliance
RF emissions CISPR 11	Group 1 / Class A

Although it has been demonstrated that the performance and safety of the X-ray equipment are not adversely affected, electromagnetic incompatibility may occur when connected to a standard domestic power supply network. In such case it may be necessary for the user to take suitable measures.

Electromagnetic Immunity

This X-ray equipment is suitable for a professional healthcare facility environment. The compliance group and class are specified in the table below. The customer or the user of the X-ray equipment should assure that it is used in such an environment.

Immunity test	Compliance level
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact
	±15 kV air
Radiated RF IEC 61000-4-3	3 V/m 80 MHz – 2.7 GHz
Proximity fields from RF wireless communications equipment IEC 61000-4-3	Table 9 of IEC 60601-1-2
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines
	±1 kV for input/output lines
Surge IEC 61000-4-5	±1 kV line to line
	±2 kV line to earth
Conducted RF IEC 61000-4-6	3 Vrms 150 KHz – 80 MHz

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Immunity test	Compliance level
	6 Vrms in ISM bands between 150 kHz and 80 MHz
Power frequency (50 Hz/60 Hz) magnetic field IEC 61000-4-8	30 A/m
Voltage dips and interruptions IEC 61000-4-11	0% U_T[1] for 250/300 cycles

[1] U_T is the AC mains voltage prior to application of the test level.

EMC-Compliance Criteria Due to the Essential Performance

- Indication of selected registration device (control and examination room)
- Indication of set filter on operator's console
- Display of name, date of birth and ID (at operator's console and RF viewer)
- Only one patient entry can be selected (active) at a time
- Patient for viewing is synchronized with patient for acquisition
- Selected exposure parameters are the right ones for the selected examination, view, and patient type
- Correct measurement results

Higher EMC disturbances than defined by the IEC 60601-1-2 could influence the essential performance.

NOTICE

Use only original cables as supplied with the system or as recommended by Philips. The use of other cables may negatively affect the EMC performance of the system.

List of Cables

Cable	Shielded	Analogue	Digital	Max. length [m]
Power 3Ph Wires System Input		x		5
Power Cables AWS	x	x		25
Power Cables Eleva Monitor Control Room	x	x		25
Power Cable View Monitor Control Room	x	x		25
CAN AWS	x	x	x	24
Optical Fiber			x	25
Ethernet AWS-BC	x		x	25

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Cable	Shielded	Analogue	Digital	Max. length [m]
Remote Power AWS on/off	x	x	x	24
On/Off ECC	x	x		24
Audio AWS-RIO	x	x		24
Exposure Handswitch Table	x	x		24
Exposure Handswitch CSM	x	x		24
Footswitch1	x	x		24
Power GeoCab 400Vac	x	x		11
Geo Emerg. off to SPDU	x	x		11
SAN Geo TRX13-RA27 X7 EN MV	x		x	11
Dose Rate Cable	x	x	x	8
SAN Xgen	x	x		8
CAN Xgen	x	x	x	8
Power Control Xgen	x	x		8
Cable FSW on Console Trolley	x	x		24
Cable USB/Ethernet for Keyboard on Cons.Tr.	x	x		40
Cable TSC2 on Console Trolley	x	x	x	24
Cable Power Monitors NPX4 ExamRoom	x	x		30
Ethernet/DVI one per Mon. ExamRoom	x		x	40
Indication Box in ExamRoom	x	x		25
Power Supply 24V Table		x		27
Power Supply Main Beam Motor	x	x		27
Power Supply Angulation Motor	x	x		27
Power Supply Middle Beam Motor	x	x		27
Power Scanning Motor Table	x	x		27
Power SID Motor Table		x		27
Power Compressor Motor		x		27
Emergency Stop Button		x		27
Emergency Micro Switch		x		27
Data A11-A2 Table	x	x		27
Data A11-A12 Table	x	x		27

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Cable	Shielded	Analogue	Digital	Max. length [m]
Data A13-A12 Table	x	x		27
Detector Holder Motor Table	x	x		27
Grid Potentiometer Table	x	x		27
Data Anti-entrapment Table	x	x		27
Data A8-A2 Table	x	x		27
Collimator Signals	x	x		27
Collimator Filter	x	x		27
Detector Image Link Fiber Optic			x	27
Detector Supply 24V	x	x		27
High Voltage O3	x	x		28
High Voltage O3	x	x		28
High Voltage O4 – GCF	x	x		28
Amplimat 7F	x	x		27
Tube Stator Cable	x	x		28
Tube Temp	x	x		28
Tube Blower	x	x		28
CAN+Power TSC1	x	x	x	23
CAN TSC1	x	x	x	4
Ethernet WiFi Access Point	x		x	20
Ethernet AWS to Backup Access Connector	x		x	20
SkyPlate Backup	x		x	7
Amplimat VS	x	x		20
Power Supply VS 230 V	x	x		20
MSB VS	x	x	x	20
Stator tube CS	x	x		26
Temp. Switch Tube CS	x	x		26
High-Voltage O3 CS	x	x		26
High-Voltage O3 CS	x	x		26
Power Supply CS 230V	x	x		20

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Cable	Shielded	Analogue	Digital	Max. length [m]
MSB CS	x	x	x	20
LAN Camera in Collimator	x		x	26

WARNING

Degradation of the performance

Do not use any portable RF communications equipment (including peripherals such as antenna cables and external antennas) closer than 30 cm (12 inches) to any part of the system. Otherwise, degradation of the performance of this equipment could result.

Electromagnetic Interference Immunity – Recommended Safety Distances

(between portable and mobile RF communications equipment (transmitters) and this system)

The system is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the system as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter [W]	Separation distance according to frequency of transmitter [m]	
	150 kHz – 80 MHz $d = 1.2\ P^{1/2}$ outside ISM bands	80 MHz – 2.5 GHz $d = 2.0\ P^{1/2}$
0.01	0.12	0.2
0.1	0.38	0.63
1	1.2	2
10	3.8	6.32
100	12	20

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

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NOTICE

- At exactly 80 MHz, the separation distance for the higher frequency range applies.
- These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

WiFi

The wireless portable detector and the access point communicate through a separate wireless network (reserved channel).This reserved channel use should be assigned in cooperation with the local IT department.

Standard used:	IEEE 802.11a, b, g, or n
Encryption:	WPA2

Philips recommends using 5 GHz.

Supported frequency bands (country-specific restrictions apply):

Wireless Portable Detector

Frequency range [MHz]	Output [mW]
2412–2484	17
5500–5700	13
5725–5825	13
5180–5240	12
5260–5320	12

Access Point

Frequency range [MHz]	Output [mW]
2400–2483	125
5150–5250	125
5250–5350	125
5470–5725	125
5725–5850	125

WARNING

Life-supporting devices

The access point and wireless portable detectors use standard WiFi technology for data transfer to the workstation. This technology is proven to be safe in combination with current pacemakers. However, it cannot be completely excluded that older pacemakers or other EMC sensitive life-supporting devices might be affected by the WiFi emissions if operated in close proximity to the detector.

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WARNING

Make sure that you keep the minimum distance to a life supporting device. Take into consideration that a strict compliance with IEC 60601-1-2 requires the following power:

Device	Frequency	Output	Minimum distance from life support devices
Wireless portable detector (SkyPlate)	2.4 GHz	17 mW	30 cm
Wireless portable detector (SkyPlate)	5 GHz	13 mW	26 cm
Access point WiFi antenna	2.4 GHz	max. 100 mW	150 cm
Access point WiFi antenna	5 GHz	max 250 mW	150 cm

The life supporting device should be certified according to IEC 60601-1-2. This standard defines the minimum distance for a given maximum emission power, corresponding to a maximum instantaneous electrical field of 10 V/m. Customers have to take into account, on their own responsibility, that older life support devices do not necessarily satisfy the IEC 60601-1-2 criteria.

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8 Accessories

For Your Safety

WARNING

Risk of injury

Before using any accessory, check if the accessory is securely locked.

WARNING

After the installation of detachable accessories, you must take great care to avoid patient injuries and collisions when the equipment is moving.

The accessories described in these Instructions for Use comply with the CombiDiagnost R90. If you want to use other equipment in combination with the CombiDiagnost R90 system, ask the provider of this equipment for a statement of conformity.

Footrest

Normal Use

The footrest supports patients when the table is tilted. The footrest can be installed on both sides of the table top.

WARNING

Risk of Injury

The maximum load is 284 kg (626.1 lb).

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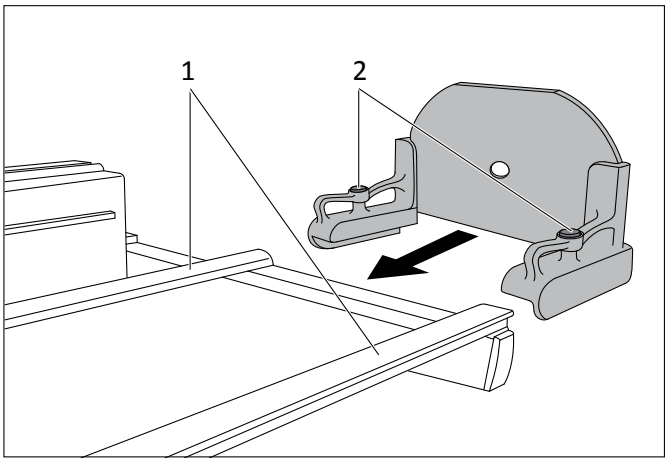
Installing and Dismantling

Installing the Footrest



▷ The table is in horizontal position.

► Fully push down both of the buttons (2) .

► Slide the footrest onto the rails (1) of the table top.

► Release the buttons (2).

► Push down both buttons to move the footrest along the rails.

► Move the footrest until it securely locks into place.

WARNING

Risk of injury

Check that the footrest is locked into place on both rails.

WARNING

The footrest must not project beyond the ends of the table top.

NOTICE

- The buttons have to be completely out. There is no red line visible on the button area.
- If there is a red line visible, move the footrest with the handles without pressing the buttons until it locks properly into place.

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Dismantling the Footrest

▷ The table is in horizontal position.

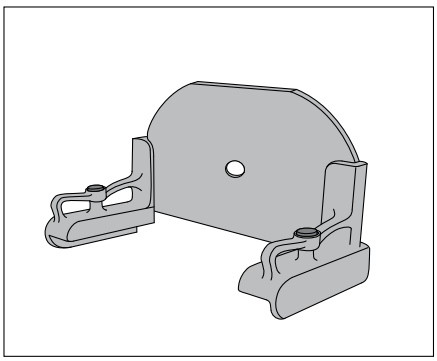
► Fully push down both of the buttons (2).

► Remove the footrest from the rails (1) of the table top.

Technical Data

Weight	8 kg (17.6 lb)

Labels



Label	Meaning
	Accessory label

Hand Grips

Normal Use

For stability, the patient can additionally use hand grips.

WARNING

Risk of injury

When using hand grips, only tilt the table when both hand grips are securely attached and positioned at the correct height.

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WARNING

Risk of Injury

The maximum load on both hand grips is 180 kg (396.8 lb).

NOTICE

The hand grips should be used in pairs to avoid an uncomfortable position.

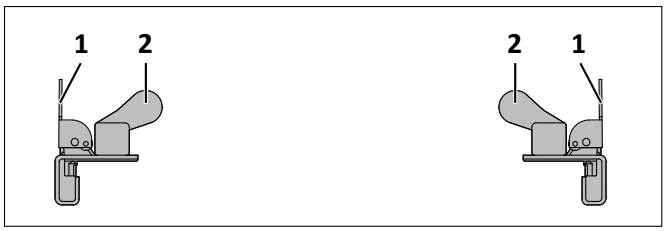
NOTICE

When tilting the table with a heavy patient on it, use more than one accessory.

The following table shows the maximum load on both hand grips depending on the angulation of the table. The maximum table load may differ.

Angulation of table	Max. load on both hand grips
Up to 30°	360 kg (793.7 lb)
Up to 45°	255 kg (562.2 lb)
Up to 60°	208 kg (458.6 lb)
Up to 90°	180 kg (396.8 lb)

Legend



No.	Meaning
1	Clamp
2	Grip

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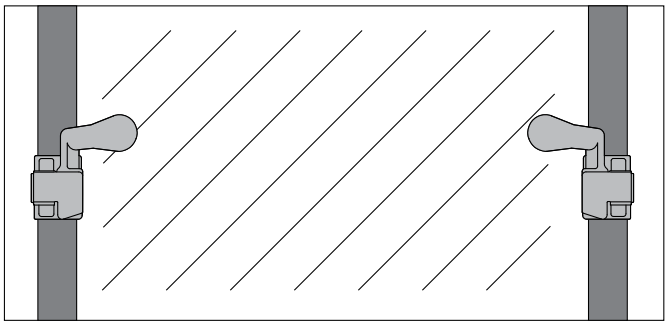
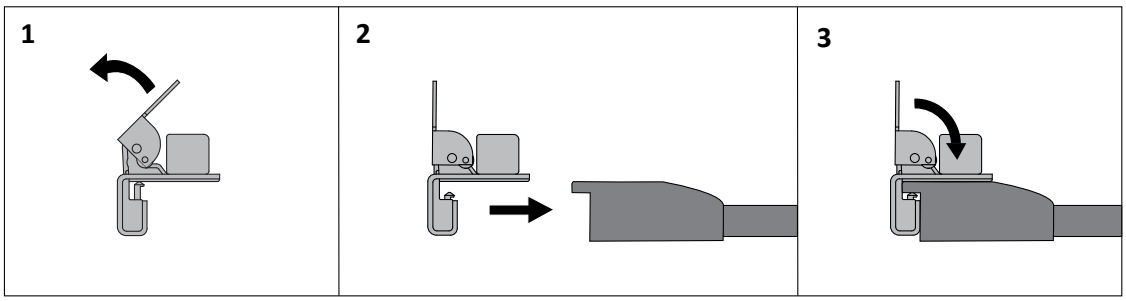
Top View of Installed Grips



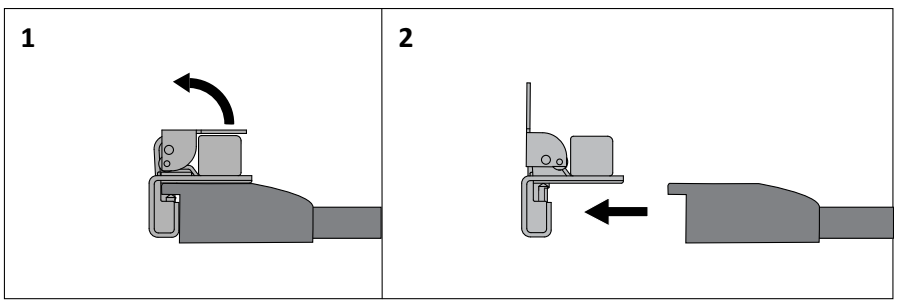
Installing

Installing



- Check that both grips are securely attached to the table top.
- Check whether the patient can reach both grips comfortably.

Dismantling



Technical Data

Weight	800 g (1.7 lb) [one grip]

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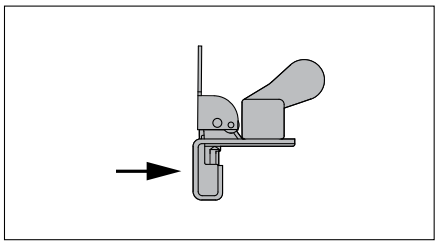
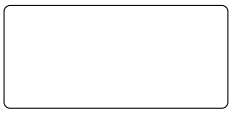
Labels



Label	Meaning
	Accessory label

Additional Accessories (Optional)

Nearby Control Trolley

Safety Instructions

WARNING

Risk of injury and system damage

Do not trip over the cable. You may fall.

WARNING

Risk of collision and injury

This accessory can be moved freely and therefore can be an obstacle for persons and moving objects.

Normal Use

The keyboard with touchpad are placed on the storage shelf. You can place the foot switch on the appropriate storage shelf, when needed. You can move the control console according to your needs.

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Legend

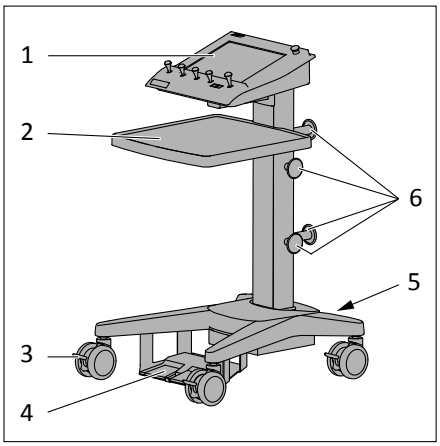

Fig. 40: Nearby control trolley

No.	Meaning
1	Control console mounted on trolley
2	Storage shelf and keyboard with touchpad (not shown)
3	Parking brake at each wheel
4	Foot switch placed on storage shelf
5	Equipotential ground connector
6	Cable holder

Equipotential Ground Connection

An equipotential ground connection point is provided. Use this product in areas meeting local standards, for example, the US national Electrical Code, for electrical safety in rooms used for medical purposes. IEC 60601-1 also gives guidance about equipotential ground connection points.

This symbol indicates the equipotential ground connector. This connector allows a connection between the equipment and the earth (ground) bus bar provided by the hospital.

Technical Data

Weight (without control console)	18 kg (39.7 lb)
Max. load of the shelf	20 kg (44.1 lb)

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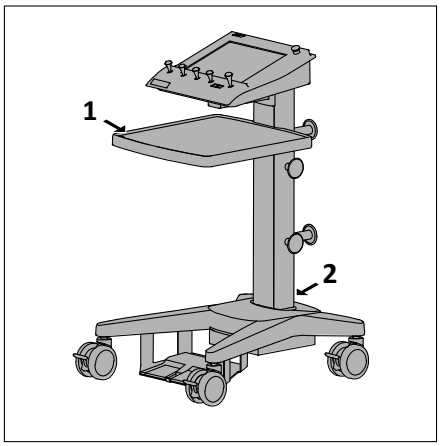
Labels



No.	Label	No.	Contents
1			Max. load
2	(A) (B)	A	Component label
		B	Country-specific product label

Monitor Trolley

Safety Instructions

WARNING

Move the monitor trolley with the hand grip only. Otherwise the monitor trolley can tip over.

WARNING

Risk of injury and system damage

Do not trip over the cable. You may fall.

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WARNING

Risk of system damage

Make sure that no obstacles, for example, cables, are in the way when moving the monitor trolley.

WARNING

With this monitor support, only use monitors that are in compliance with IEC 60601-1.

CAUTION

Max. load of the storage shelf is 20 kg (44 lb).

NOTICE

If you use the monitor support with other equipment than Philips recommends doing so, Philips is not responsible for the function of this equipment.

Normal Use

With the monitor trolley, you can move the monitors according to your needs. There are monitor trolleys available for one or two monitors.

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Legend

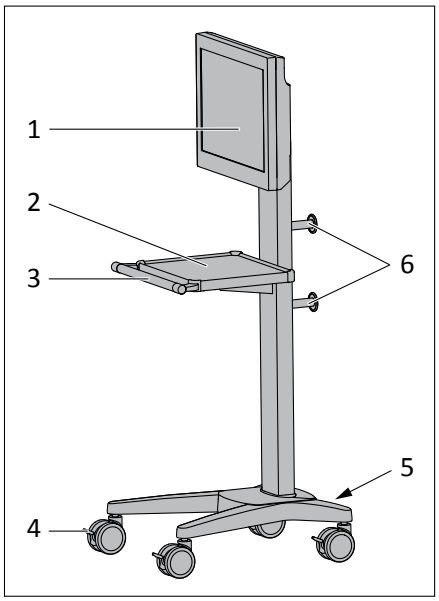

Fig. 41: Monitor Trolley, Example with One Monitor

No.	Meaning
1	Monitor mounted on Trolley
2	Storage shelf
3	Hand grip
4	Parking brake at each wheel
5	Equipotential ground connector
6	Cable holder

Equipotential Ground Connection

An equipotential ground connection point is provided. Use this product in areas meeting local standards, for example, the US national Electrical Code, for electrical safety in rooms used for medical purposes. IEC 60601-1 also gives guidance about equipotential ground connection points.

This symbol indicates the equipotential ground connector. This connector allows a connection between the equipment and the earth (ground) bus bar provided by the hospital.

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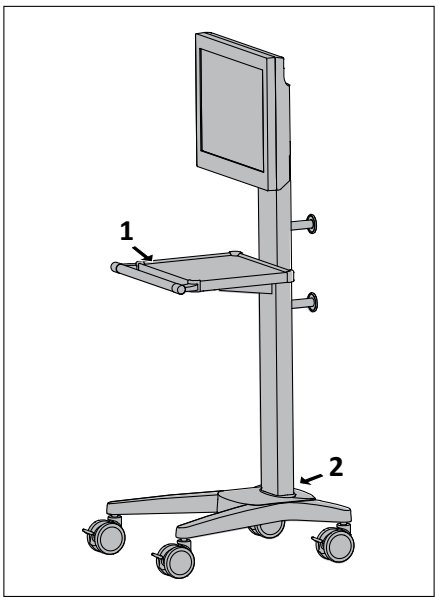
Technical Data

Weight (without monitor)	19 kg (41.9 lb)
Total weight of mounted monitors	Up to 10 kg (22 lb) per monitor

Labels



No.	Label	No.	Contents
1			Max. load
2	(A) (B)	A	Component label
		B	Country-specific product label

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Monitor Ceiling Suspension

Safety Instructions

WARNING

Risk of collision and injury

This accessory can be moved freely and therefore can be an obstacle for persons and moving objects.

WARNING

Make sure that neither patients or operating staff can hit their heads and that the equipment cannot collide with monitors while moving.

WARNING

Risk of injury

Position the monitor ceiling suspension in such a way that patients or staff cannot hurt themselves.

WARNING

With this monitor support, only use monitors that are in compliance with IEC 60601-1.

NOTICE

To move the monitor support, use the hand grip only.

NOTICE

If you use the monitor support with other equipment than Philips recommends doing so, Philips is not responsible for the function of this equipment.

Normal Use

With the monitor ceiling suspension, you can move the monitors according to your needs. There are monitor ceiling suspensions available for one, two or three monitors.

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Legend

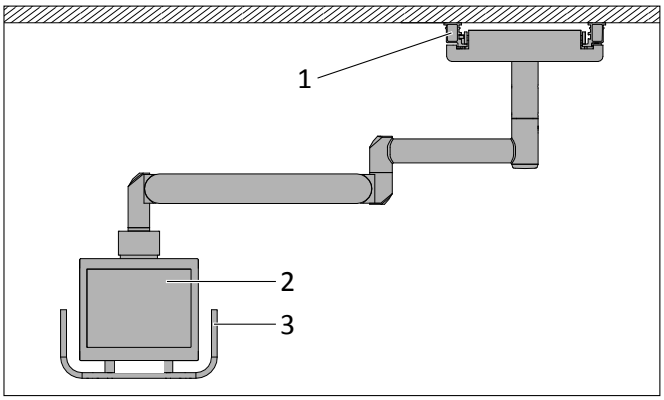

Fig. 42: Monitor Ceiling Suspension, Example with one Monitor

No.	Meaning
1	Rails
2	Monitor mounted on ceiling suspension
3	Hand grip

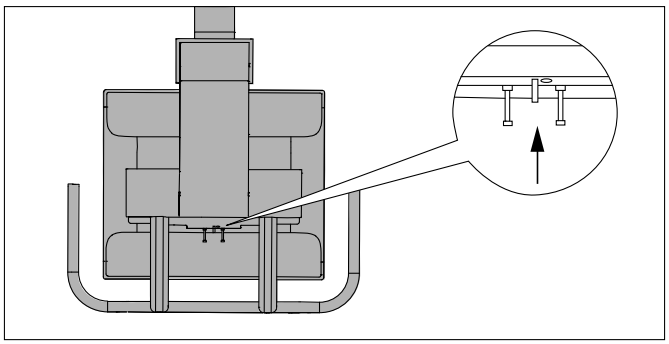

Fig. 43: Equipotential Ground Connector, Example with one Monitor

The monitor ceiling suspension provides an equipotential ground connector.

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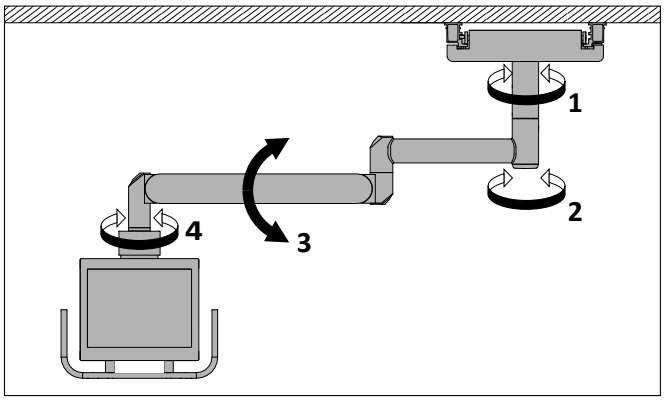
Movements



No.	Meaning
1	Rotate the ceiling suspension arm up to 315°. [1]
2	Rotate the ceiling suspension arm up to 320°. [1]
3	Swivel the ceiling suspension arm up to ±40°.
4	Rotate the ceiling suspension arm up to 330°. [1]
Not shown	Move the monitor ceiling suspension along the rails.

[1] Marking lines indicate the end stop and how far you are away from it.

Equipotential Ground Connection

An equipotential ground connection point is provided. Use this product in areas meeting local standards, for example, the US national Electrical Code, for electrical safety in rooms used for medical purposes. IEC 60601-1 also gives guidance about equipotential ground connection points.

This symbol indicates the equipotential ground connector. This connector allows a connection between the equipment and the earth (ground) bus bar provided by the hospital.

Technical Data

	Total weight of mounted monitors	Weight of a single monitor *
Ceiling suspension for one monitor	0.9 kg to 8.9 kg (2 lb to 19.6 lb)	-
Ceiling suspension for two monitors	6 kg to 23 kg (13.3 lb to 50.7 lb)	3 kg to 11.5 kg (6.6 lb to 25.3 lb)

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	Total weight of mounted monitors	Weight of a single monitor *
Ceiling suspension for three monitors BNC	19.2 kg to 34.2 kg (42.4 lb to 75.4 lb)	6.4 kg to 11.4 kg (14.1 lb to 25.1 lb)
Ceiling suspension for three monitors Ethernet	4.2 kg to 21.2 kg (9.3 lb to 46.7 lb)	1.4 kg to 7.1 kg (3.1 lb to 15.7 lb)

* When the weight of a single monitor is higher, make sure of the following:

- The sum of all mounted monitors must not exceed the total weight.
- The ceiling suspension must be well-balanced.

Labels

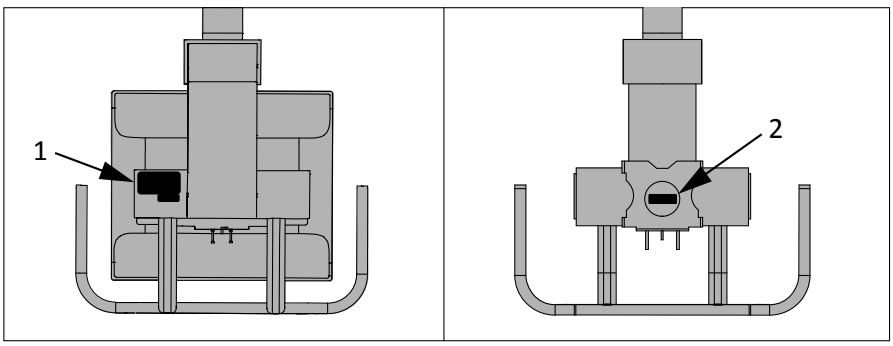

Fig. 44: Example with one monitor: Rear view and front view

No.	Label		Meaning
1	(A) (B)	A	Component label
		B	Country-specific product label
2			Min. and max. load

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Parking Frame for Accessories

Labels

Label	Meaning
	Accessory label

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Shoulder Supports

Normal Use

When moving the table into Trendelenburg position, the shoulder supports keep the patient on the table.

WARNING

Risk of injury

When using shoulder supports, only tilt the table when both shoulder supports are securely attached and positioned at the correct height.

WARNING

Risk of injury

The maximum load for both shoulder supports is 120 kg (264.6 lb) altogether.

NOTICE

When tilting the table with a heavy patient on it, use more than one accessory.

Angulation of table	Max. patient weight
Up to 30°	240 kg (529.1 lb)
Up to 45°	170 kg (374.8 lb)
Up to 60°	139 kg (306.4 lb)
Up to 90°	120 kg (264.6 lb)

NOTICE

- Always install both shoulder supports.
- The table should be in horizontal position and the patient should already be lying on the table before the shoulder supports are attached.
- When tilting the patient into a Trendelenburg position, use more than one kind of fixation to keep the patient from sliding down the table.
- When using sterile covers, attach the shoulder supports to the table top first.

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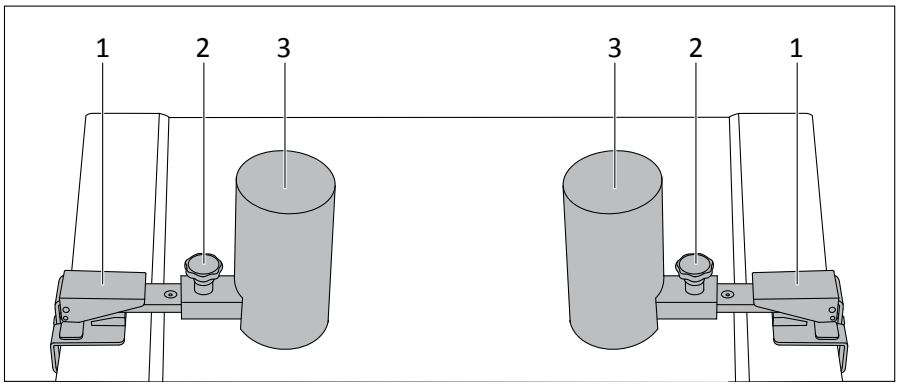
Legend

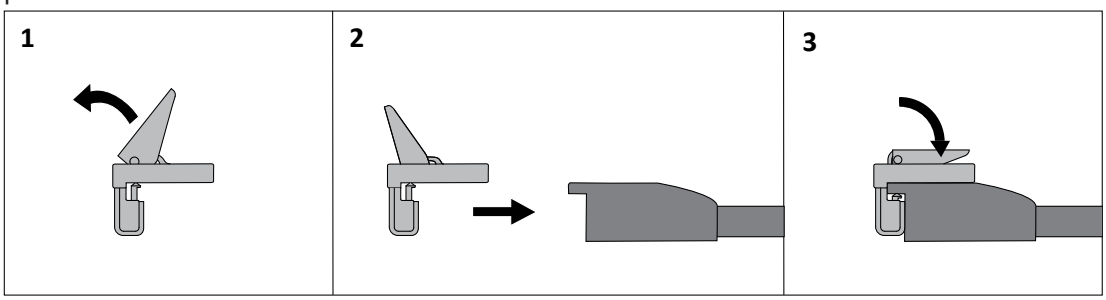


No.	Meaning
1	Clamp
2	Screw
3	Shoulder pad

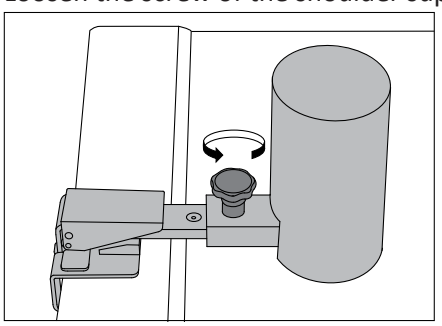
Tab. 2: Table title

Installing

- Attach both shoulder supports at the height needed. Both shoulder supports have to be parallel.



- Check that both shoulder supports are securely attached to the table top.
- Loosen the screw of the shoulder support.



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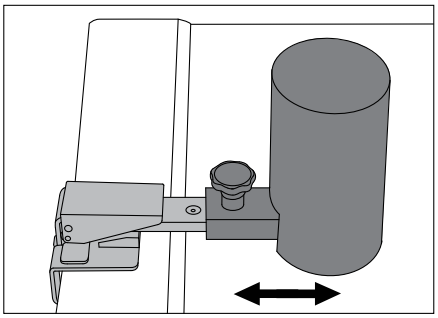
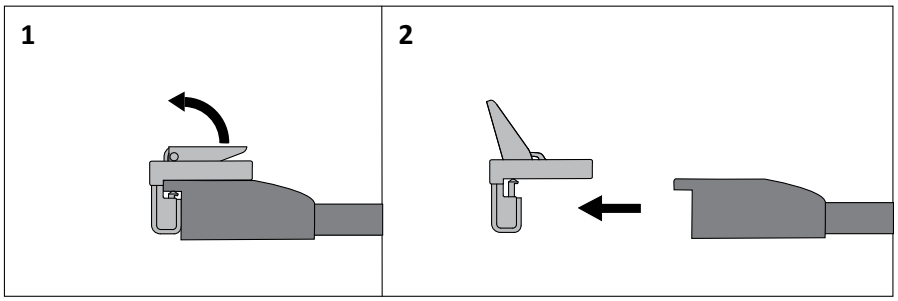
► Position the shoulder pad as close as possible to the patient's shoulder.



► Tighten the screw hand-tight.

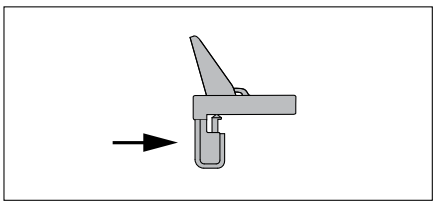
Dismantling



Technical Data

Weight	2.4 kg (5.3 lb) one shoulder support

Labels



Label	Meaning
	Accessory label

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Sidebar

Normal Use

The patient can hold on to the sidebar with one or two hands.

Safety Instructions

WARNING

Risk of injury

Before tilting the table, check the following:

- **The side bar is securely attached to the table top.**
- **The patient must be able to reach the side bar securely.**

WARNING

Risk of injury

When tilting the table, use the side bar only together with the footrest. Do not tilt the table in Trendelenburg position when the sidebar is in use.

WARNING

The maximum patient weight for the use of the sidebar is 180 kg (396.8 lb).

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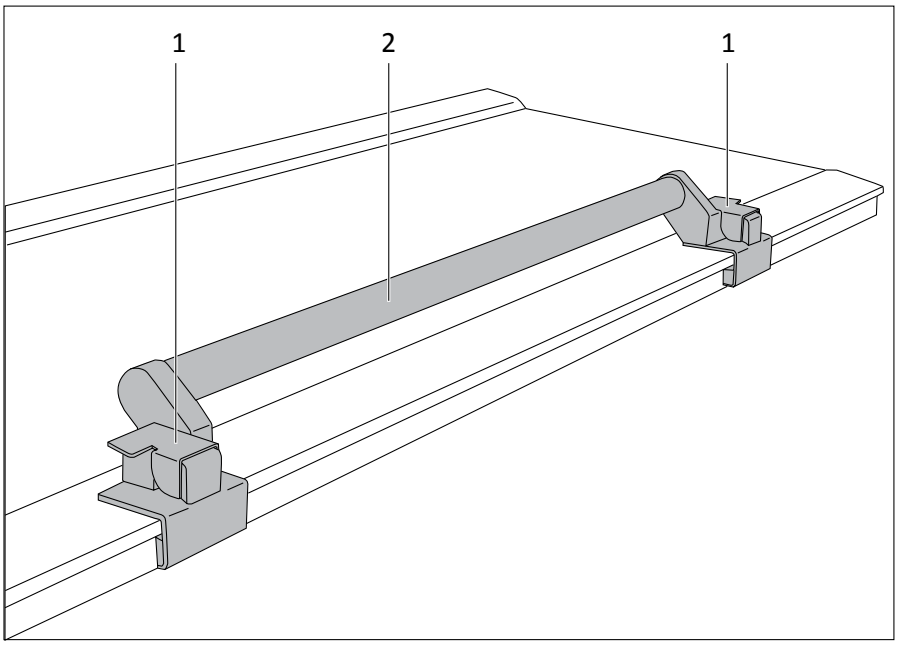
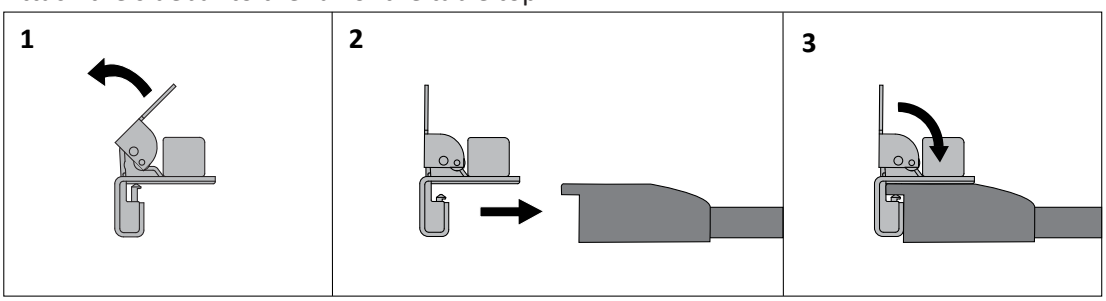
Legend



No.	Meaning
1	Clamps
2	Sidebar

Installing

- Attach the sidebar to the rail of the table top.



- Check that the sidebar is securely attached to the table top.
- Check whether the patient can reach the sidebar comfortably.

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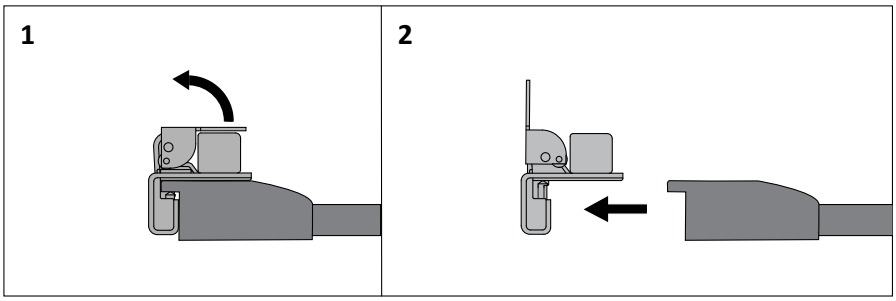
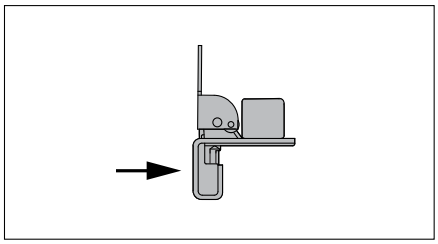
Dismantling



Technical Data

Weight	2.1 kg (4.6 lb)

Labels



Label	Meaning
	Accessory label

Compression Belt

Safety Instructions

WARNING

Risk of injury

Only use the compression belt when the table top is in horizontal position.

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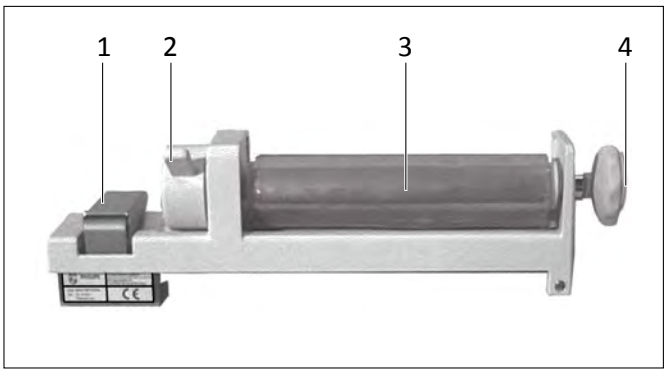
NOTICE

- Only use the compression belt supplied by Philips.
- The patient must be lying on the table top before the compression belt is attached.

Normal Use

A compression belt may be used to apply moderate compression to the patient on the table top to improve visualization of internal organs. Sometimes a balloon is placed between the compression band and the patient, for example during intravenous pyelography (IVP).

Legend



No.	Meaning
1	Clamp
2	Lever to release the compression belt
3	Compression belt
4	Knob to tighten the compression belt

Installing

► Place the patient on the table top.

► Open the clamps on both parts of the compression belt ratchet set.

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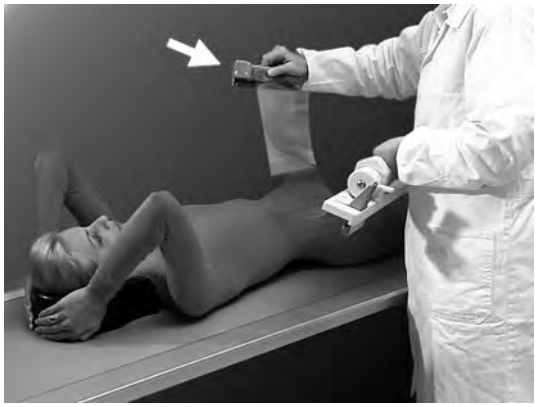
- Fit the slim part of the set over the side rail and fold the clamp down.



- Guide the compression belt over the patient.

- Fit the “ratchet” part of the set over the side rail and fold the clamp down.

- Turn the knob clockwise to tighten the belt.
- Place a hand between the patient and the compression belt (or the balloon and the compression band) to judge the compression force and to avoid friction.

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► Continue to turn the knob clockwise to tighten the belt until you achieve the required compression force on the patient.

► Check that the compression belt is securely attached on both sides.

Dismantling

► Press lightly with one hand on the compression belt.

► Press the lever on the ratchet set to release the ratchet.

Technical Data

Weight	3.5 kg (7.7 lb)

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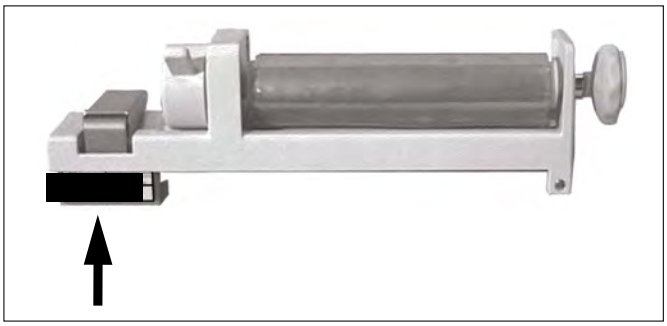
Labels



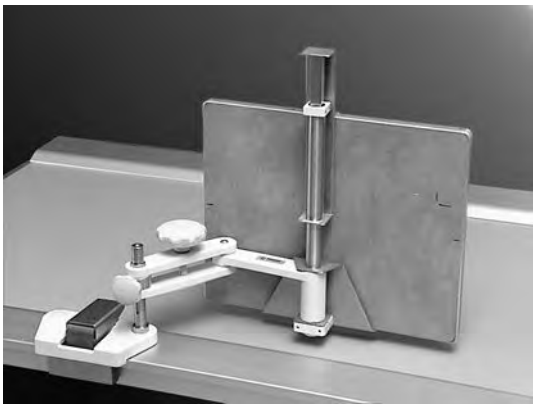
Label	Meaning
	Accessory label

Adjustable Lateral Cassette Holder

Normal Use

The adjustable lateral cassette holder may be used to hold a cassette for lateral exposures. It can be attached to the side rails of the table top.

As the holder is spring loaded, it can be used with cassettes of different sizes.



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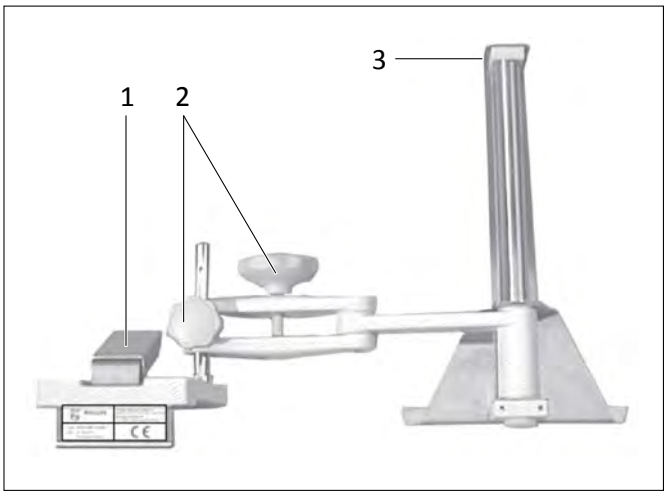
Philips

Legend



No.	Meaning
1	Clamp
2	Knob to adjust the position
3	Cassette spring

Installing

WARNING

Keep your fingers out of the range of the cassette springs.

- ► Support the patient with a foam cushion.
- ► Open the clamps.

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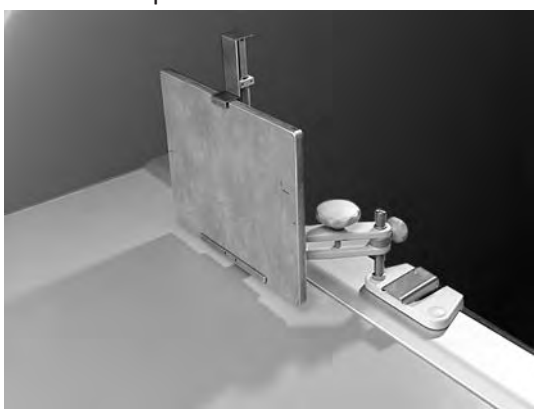
- Set the clamp of the lateral cassette holder at the right level on the side rail of the table top.



- Fold the clamp down.
- Loosen the adjustment screws on the cassette holder as far as necessary to move the lateral cassette holder into position.
- When it is in position, tighten the screws hand tight.
- Make sure that the cassette holder is securely attached to the table top.

Fig. 45: Patient positioned next to the lateral cassette holder

Technical Data

Weight	2.7 kg (6 lb)

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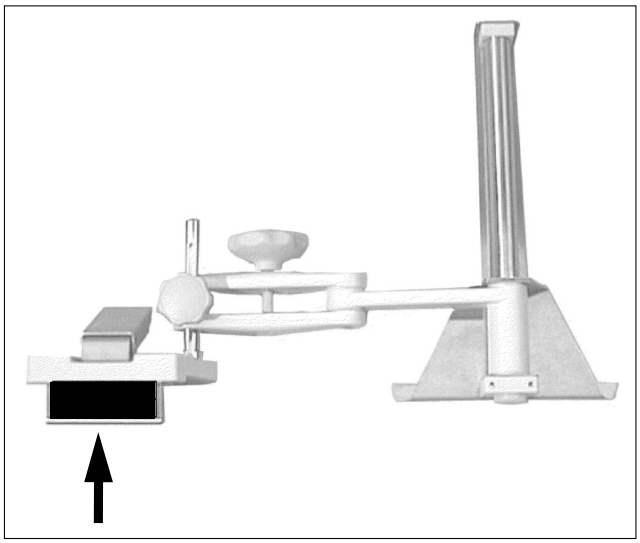
Labels



Label	Meaning
	Accessory label

Leg Supports

Normal Use

Always use the leg supports in pairs.

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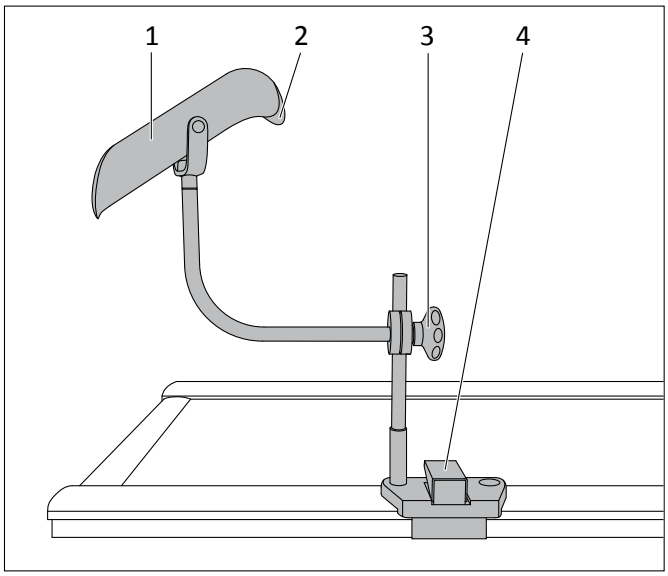
Legend



No.	Meaning
1	Tray
2	Wide lip
3	Screw
4	Clamp

Safety Instructions

WARNING

Risk of injury

When the leg support is used and you want to tilt the table, observe the following:

- **The sidebars must be installed.**
- **Make sure that the patient grabs the sidebar and does not slide off the table.**

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WARNING

Risk of collision

Make sure that the column does not collide with the leg supports when performing the following movements:

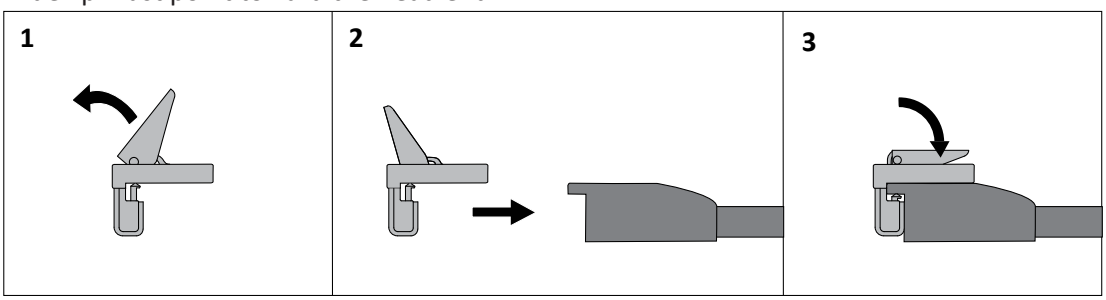
- **Moving the column in longitudinal direction.**
- **Angling the column.**

WARNING

The maximum load for each leg support is 21 kg (46.3 lb).

Installing

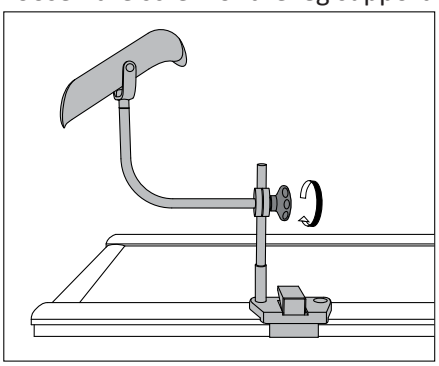
► Attach both leg supports at the position needed. Both leg supports have to be parallel. The wide lip must point toward the head end.



► Check that both leg supports are securely attached to the table top.

► Position the patient on the table top.

► Loosen the screw of the leg support.



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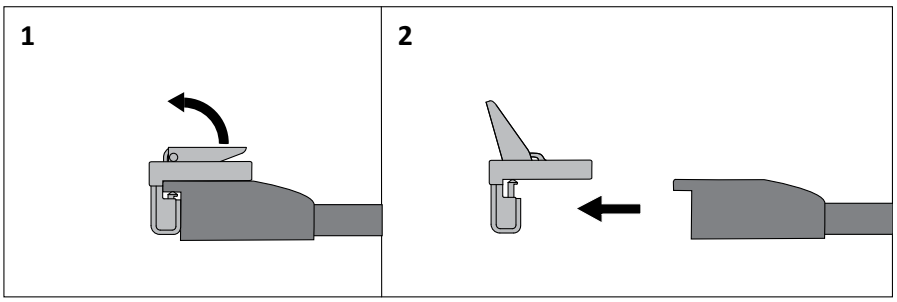
- Place the leg the supports in the position needed and support the patient while adjusting them.

- Tighten the screw hand-tight.

Dismantling



Technical Data

Weight	2.9 kg (6.4 lb) one leg support

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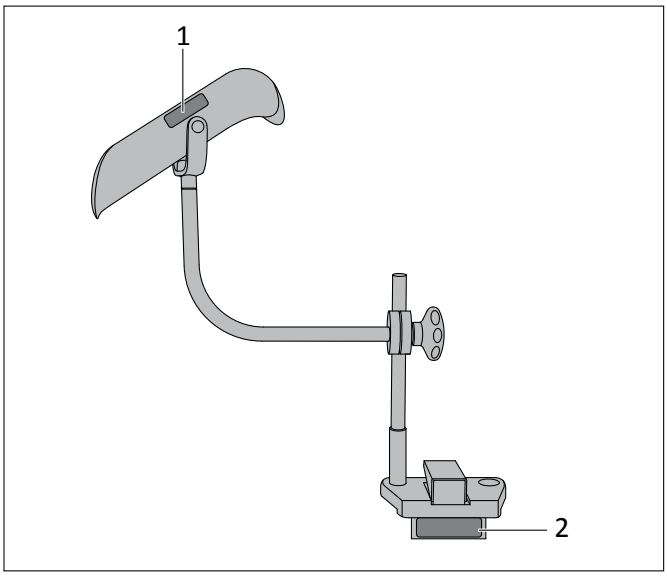
Labels



No.	Label	Meaning
1		Max. load
2		Accessory label

Infusion Bottle Holder

Normal Use

The infusion bottle holder is suitable for installing the infusion bottle on the table top.

WARNING

Risk of collision

Make sure that the infusion bottle holder does not collide with the column when performing the following movements:

- **Moving the column in longitudinal direction.**
- **Angling the column.**

Prohibited Use

The infusion bottle holder is not a suitable aid for getting on the table.

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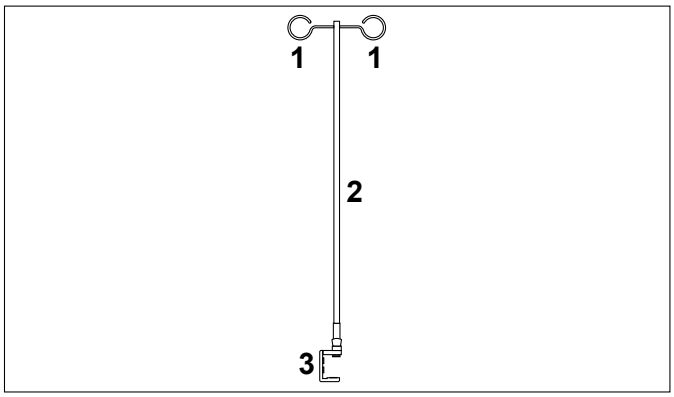
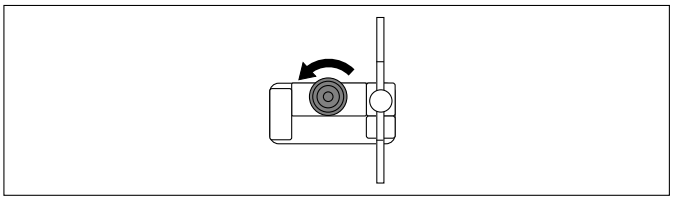
Legend



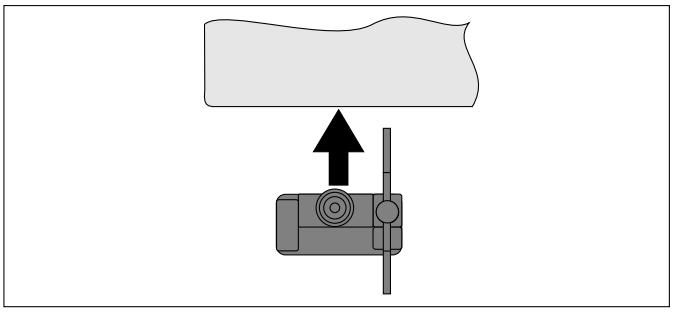
No.	Meaning
1	Eyelets
2	Rod
3	Table clamp

Installing

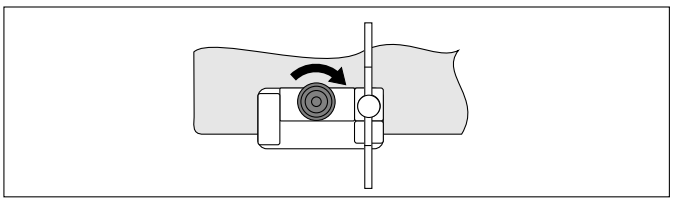
1



2



3



Re 1:
Unscrew knob fully.

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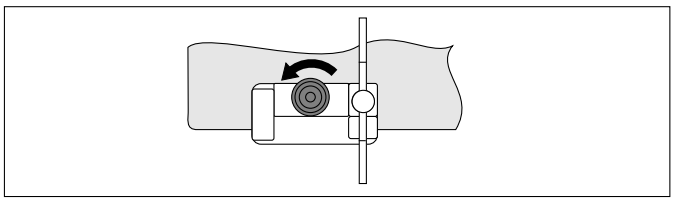
Re 2:
Position table clamp from underneath at an angle and then pull up. If not properly arrested, the table clamp may release and injure patients and personnel.

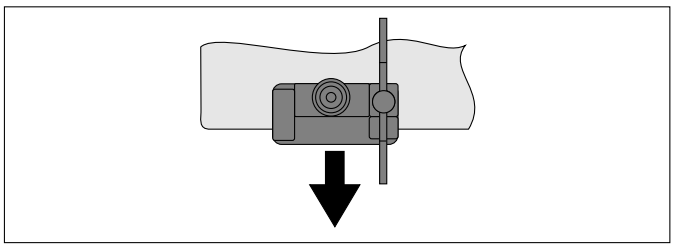
Re 3:
Turn the knob until it no longer engages.

Dismantling

1



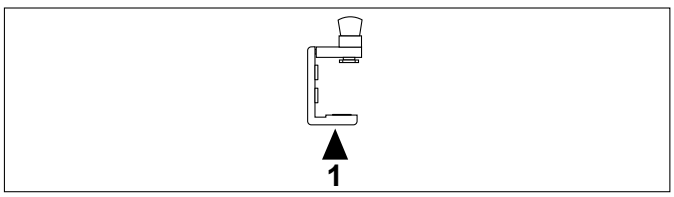
2



Technical Data

Height above table top	approx. 860 mm
Weight	1.8 kg

Labels



Label	Meaning
	Accessory label

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Arm Support for Catherization

Normal Use

When performing a catheterization, the arm support can be used to support an arm outside the table top area.

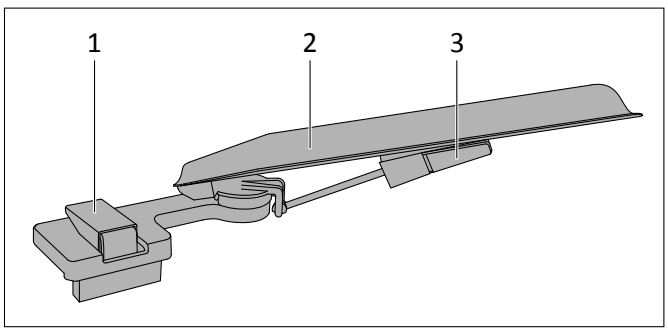
WARNING

The maximum load for the arm support is 23 kg (50.7 lb).

NOTICE

- Philips recommends you to place a cushion between the arm and the arm support to avoid unnecessary pressure.
- Cover the support for hygienic reasons.

Legend



No.	Meaning
1	Clamp
2	Tray
3	Lever

Installing

WARNING

The arm support must be mounted on the external table top rail only.

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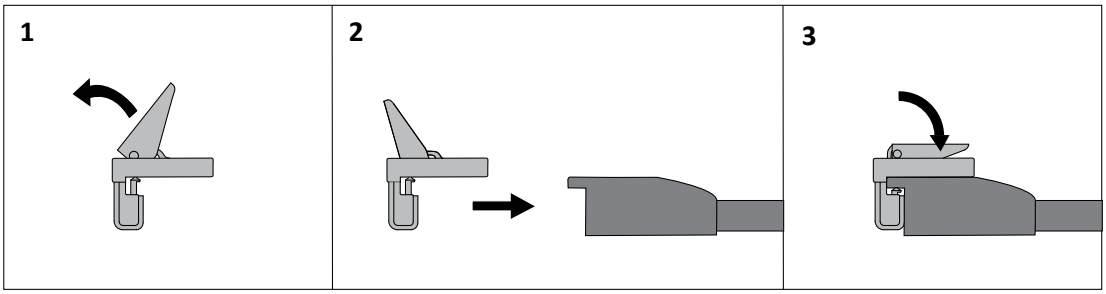
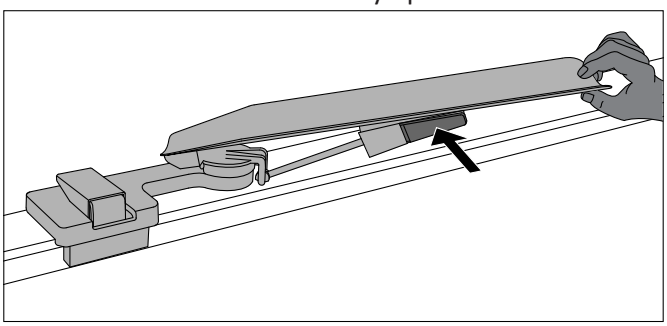
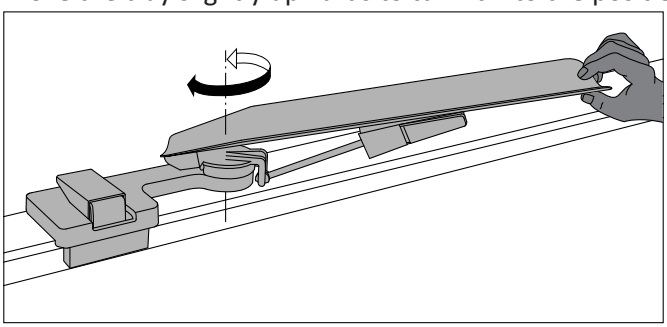
► Position the arm support as close as possible to the patient's shoulder.



► Press the lever to move the tray up and down.



► Move the tray slightly upwards to turn it into the position needed.



WARNING

Check whether the arm support is securely locked before you position the patient's arm on it.

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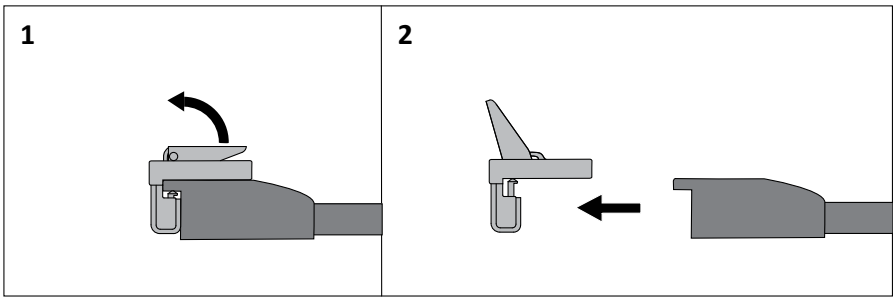
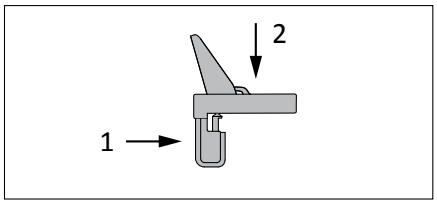
Dismantling



Technical Data

Weight	3.1 kg (6.8 lb)

Labels



No.	Label	Meaning
1		Accessory label
2		Max. load

Ankle Clamps

Normal Use

Ankle clamps may be used to help support the patient during table tilting. They must not be used for any other purpose, such as securing patient's wrists. Use ankle clamps with the correctly fitted footrest only.

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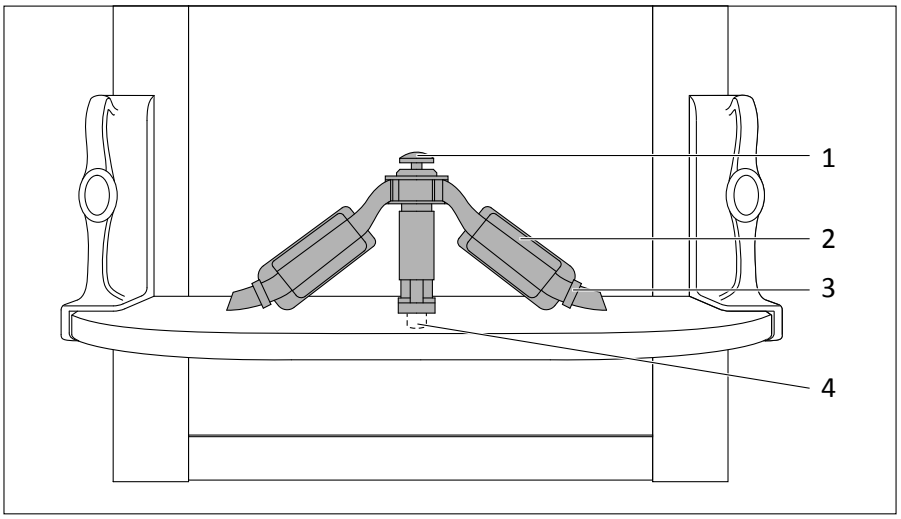
Legend



No.	Meaning
1	Knob
2	Rubber sleeve
3	Fastener
4	Pin

Safety Instructions

WARNING

Make sure that the ankles are fastened securely. Always fasten the belts tight and secure around the ankle of the patient.

WARNING

Before every use, check the ankle clamps for possible damage or excessive wear. Especially check the belts for ruptures, cuts and fraying. Do not use any damaged parts.

WARNING

Use ankle clamps for a patient weight up to 180 kg (397 lb) only.

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NOTICE

When tilting the table with a heavy patient on it, use more than one accessory.

Angulation of table	Max. patient weight
Up to 30°	360 kg (793.7 lb) [1]
Up to 45°	255 kg (562.2 lb)
Up to 60°	208 kg (458.6 lb)
Up to 90°	180 kg (396.8 lb)

[1] Make sure that the max. load of the table is not exceeded.

Installing the Ankle Clamps on the Footrest

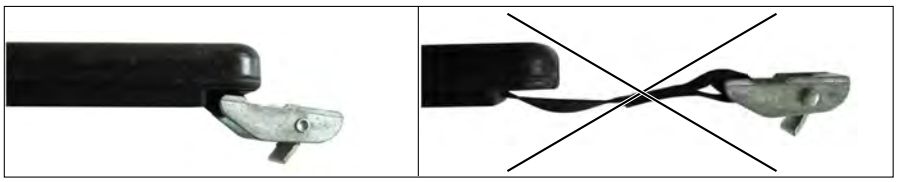
- Pull back and hold the rubber sleeves.
- Press in and hold the knob.
- Fit the pin into the hole in the footrest and release first the knob and then the rubber sleeves.
- Try to pull the ankle clamps out of the footrest to check whether they are securely attached.

NOTICE

You can turn the ankle clamps for prone or supine positions.

Attaching the Ankle Clamps to the Patient

- Make sure that the table is in horizontal position.
- Check that the footrest is locked onto the table top and cannot be moved.
- Place the patient on the table top.
- Make sure that the fastener is located near the rubber sleeve.



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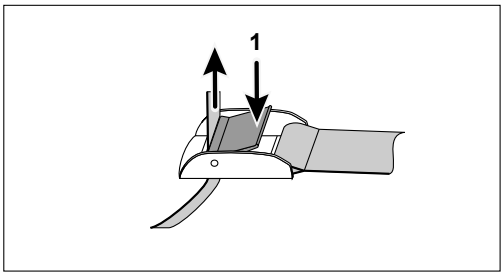
► Press and hold the release lever (1).



► Attach the ankle clamps securely. Do not make them so tight that you may injure or hurt the patient.

► Check that the ankle clamps are securely attached and cannot be pulled out of the footrest.

► If necessary, correct the patient's position.

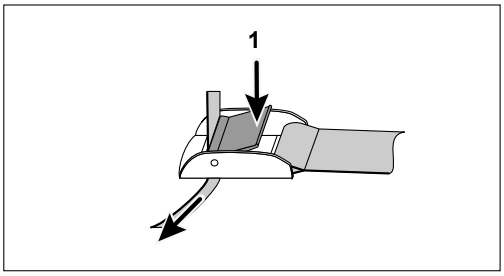
WARNING

Tilt the table only when the ankle clamps are securely attached and the footrest is locked to the table top.

Removing the Ankle Clamps from the Patient

► Move the table to the horizontal position.

► Press and hold the release lever (1) to unfasten the lock.



► Loosen the belts of the ankle clamps.

► Remove the patient from the table top.

Removing the Ankle Clamps from the Footrest

► Pull back the collar.

► Press and hold the knob and pull the ankle clamps out of the footrest.

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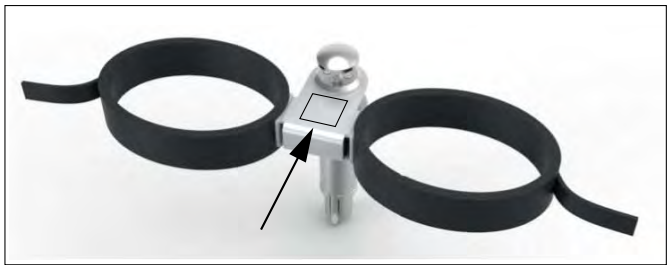
Labels



Label	Meaning
	Accessory label

Adult Headrest

Normal Use

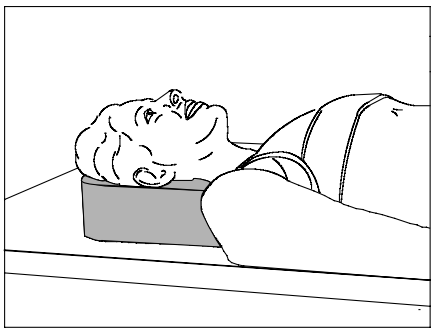
You can support a patient's head when the patient lies on his back. Only use the headrest for adults and when the head fits properly in it.

How to Use

▷ The patient is lying on his back (supine).

► Gently lift the patient's head and place it in the headrest.

► Make sure that the headrest fits well around the patient's neck to minimize possible discomfort.



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Technical Data

Dimensions	Approx. 250 mm × 250 mm × 80 mm (9.8 in × 9.8 in × 3.2 in)
Weight	< 1kg (2.2 lb)

Labels

This accessory is made of soft material. Therefore, the label can be found in the packaging.

Label	Meaning
	Accessory label

Mattress

Normal Use

You can use the mattress to position the patient comfortably.
Make sure that you follow the cleaning instructions.

NOTICE

Crumpling of the cover material may lead to visible artifacts.

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Philips

Technical Data

Dimensions	2,000 mm × 580 mm × 40 mm (±5 mm each) (78.7 in × 22.8 in × 1.6 in [±0.2 in each])
Weight	Approx. 3 kg (6.6 lb)
Al equivalent	<0.4 mm

Labels

This accessory is made of soft material. Therefore, the label can be found in the packaging.

Label	Meaning
	Accessory label

Rotatable Stool for Footrest

Normal Use

You can attach a rotatable stool to the footrest.

Safety Instructions

WARNING

Do not tilt the table when the stool is fastened to the footrest. Only attach the stool to the footrest when the table is in vertical position.

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Philips

NOTICE

The maximum load for the rotatable stool is 180 kg.

Installing

▷ The footrest is attached to the foot end of the table top.

▷ The table is in vertical position

► Slide the metal pin at the bottom side of the seat into the hole in the footrest.

► Check that the seat is securely attached.

Dismantling

► Pull the stool out of the footrest.

Labels

Label	Meaning
	Accessory label

Babix Holder

Normal Use

The Babix holder

- Is only designed for use with the wall stand (VS).
- Is for attaching a baby bucket for examining small children.
- Is only swiveled in front of the cover plate of the Bucky for the duration of the examination.

Prohibited Use

The Babix holder is not suitable for use as a stretch grip.

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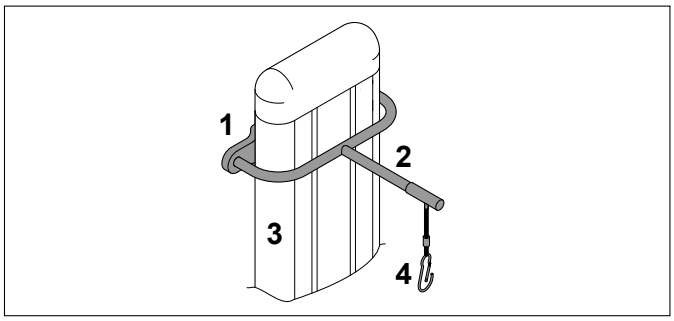
Philips

Legend



No.	Meaning
1	Babix holder
2	Holding arm
3	Column
4	Suspension

Installing

Customer service

- Mounts the Babix holder at the desired height
- Sets the Babix holder to the necessary length

Operating

WARNING

- **Max load: 10 kg**
- **Adjust the detector before using the holder.**
- **After the exposure remove the holder.**
- **When the Babix holder is attached, do not move the wall stand.**

► Adjust the detector.

► Attach the holder to the fixture.

► Lift the holder and insert as far as the stop (1).

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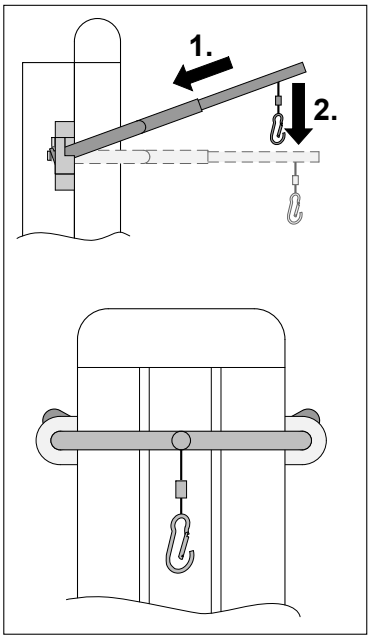
► Lower the holder to the horizontal position (2).



The green indicators signal that the holder is correctly inserted.

► Put the child into a baby bucket that has the suitable size and secure the child.

► Hang the baby bucket with the child in it on the hook.

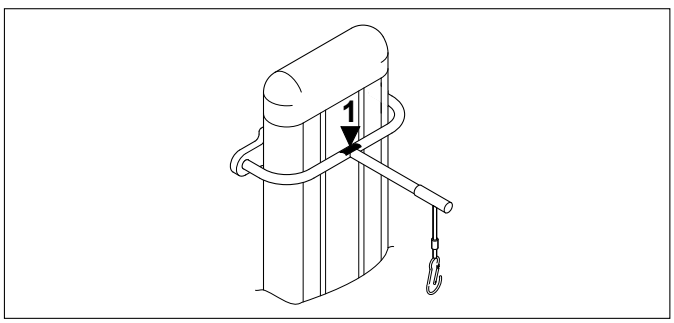
► After the exposure, remove the baby bucket and take the child out.

► Remove the holder.

Technical Data

Max. load	10 kg (22 lb)

Labels



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No.	Contents	Meaning
1		Accessory label

Stretch Grip for Wall Stand

Normal Use

The stretch grip is suitable for supporting the patient in the correct standing position at the wall stand.
The maximum load is 20 kg (44 lb).

Prohibited Use

The stretch grip must not be used as an aid for getting on the table.

The maximum load is 20 kg (44 lb).

CAUTION

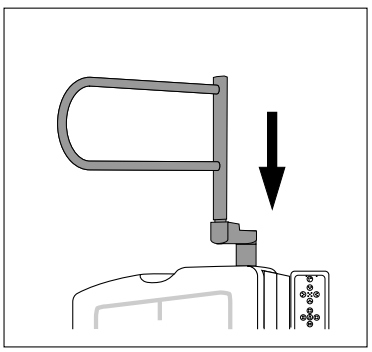
Risk of damage and injury

The patient must not hang from the stretch grip.

Installing/Dismantling

Installing

- ► Insert the stretch grip on the left hand side or the right hand side of the Bucky unit.
- ► Make sure that the stretch grip is fully inserted in the Bucky unit.



Dismantling

- ► Remove the stretch grip from the Bucky unit.

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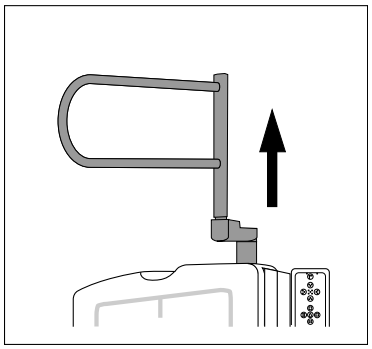

Swiveling the Stretch Grip

CAUTION

Risk of trapping fingers!

You may trap your fingers between the stretch grip and the Bucky unit.

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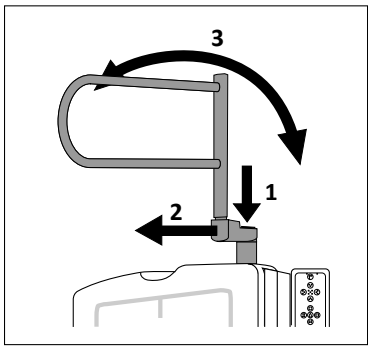
You can swivel the stretch grip to adjust its height to the patient's height.



- ► Press the button (1) and keep it pressed.
- ► Pull the stretch grip (2) and keep it pulled. Let go the button (1).
- ► Swivel the stretch grip (3) until it locks into the desired position.
- ► Make sure that the stretch grip is locked.

NOTICE

When the stretch grip locks, the button (1) returns to its original position with a clicking sound.

Philips

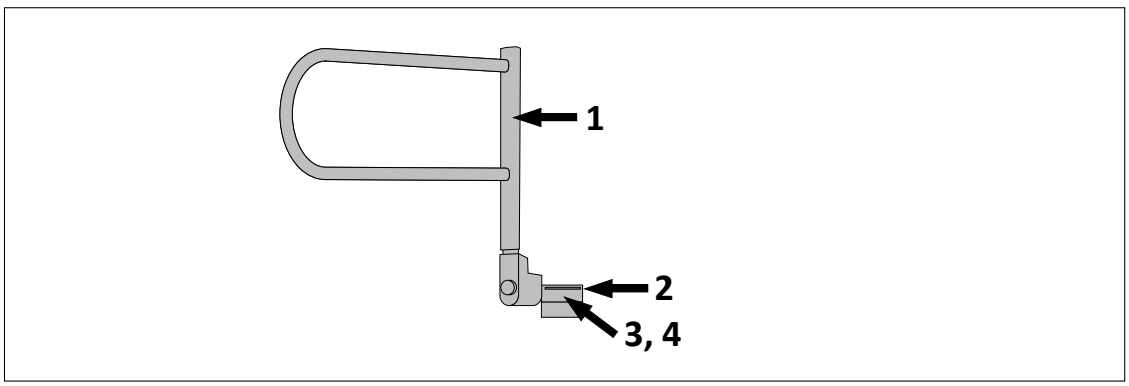
Technical Data

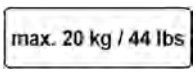
Max. load	20 kg (44 lb)
Weight	1.7 kg (3.7 lb)

Compatibility

- Wall stand (vertical stand VS2)

Labels



No.	Contents	Contents
1		Max. load: 20 kg (44 lb)
2		Accessory label
3		Do not tilt the detector if the stretch grip is mounted.
4	On the rear side (opposite to label no. 3): 	Do not tilt the detector if the stretch grip is mounted.

Lead Apron for Wall Stand

Normal Use

The radiation protection lead apron protects against direct scattered radiation from the patient.

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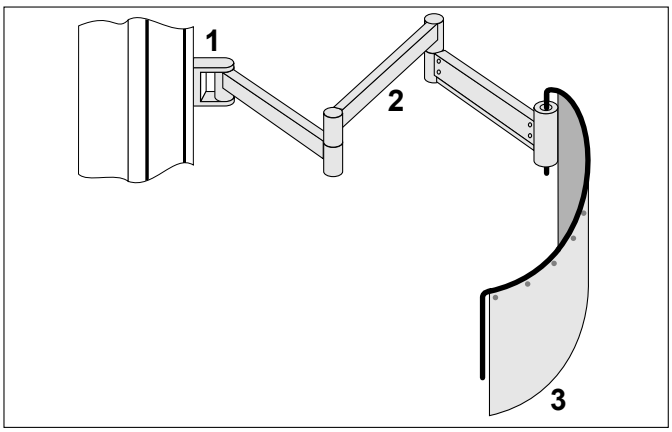
NOTICE

When the Bucky unit is horizontal, pull this apron around the patient. This ensures that you are adequately protected against scattered radiation.

Prohibited Use

Do not put any weight on the holder, holding arm or lead protection.

Legend



No.	Meaning
1	Holder
2	Holding arm
3	Lead protection

Operation

- ► Position the patient at the wall stand.
- ► Position the apron around the patient.

Max. load: 15 kg

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Philips

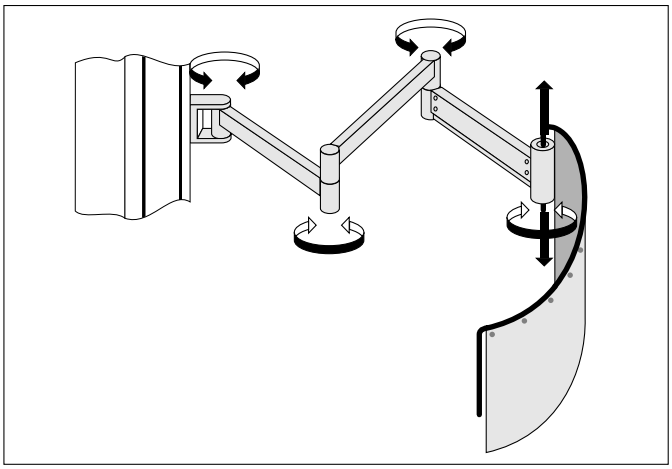
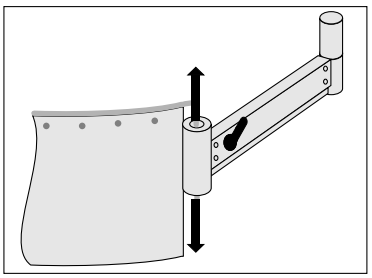


Fig. 46: Possible movements

Raising/Lowering the Lead Apron



- ► Unlock the lever.
- ► Raise/lower the lead apron.
- ► Lock the lever.

Compatibility

- Wall stand (vertical stand VS)

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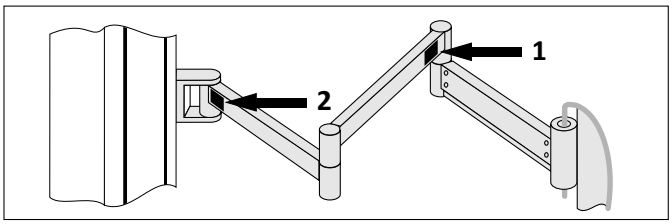
Labels



No.	Contents	Meaning
1	max. load 15 kg / 33 lb	Maximum load: 15 kg (33 lb)
2		Accessory label

Bar Code Scanner

Normal Use

With the bar code scanner, you can scan patient data for further use.

Prohibited Use

NOTICE

Do not use the bar code scanner within the patient environment.

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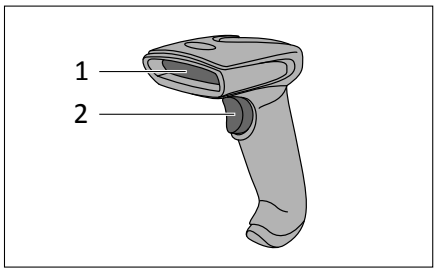
Legend



No.	Meaning
1	Scanner
2	Release button

Technical Data

Dimensions	150 mm × 112 mm × 79 mm (5.9 in × 4.4 in × 3.1 in)
Weight	160 g (0.35 lb)
Drop height	1.5 m (59.1 in) on concrete
Input voltage	5 V ±5%
Operating power	200 mA @ 5 V
Standby power	125 mA @ 5 V
Interfaces	RS232 KBW/USB RS232C (±12 V) RS485 via adapter
Scan Performance	
Scan pattern	Single line
Motion tolerance	51 cm (20 in) per second
Scan rate	Up to 270 scans per second
Print contrast	20%
Pitch, skew	±65°
Bar code	Standard 1D and GS1 DataBar™ symbologies

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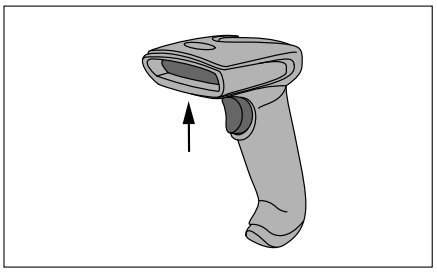
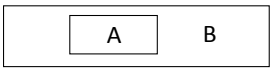
Labels





	Contents
A	Type number
B	Compliance information

Accessories for the SkyPlate (Optional)

General Aspects

NOTICE

When you combine the X-ray equipment with accessories or other items, adverse effects might arise from materials located in the X-ray beam.

Mobile Detector Holder

Safety Instructions

WARNING

Always apply the brakes

- **When the Mobile Detector Holder is positioned on an inclined floor, apply the brakes. This prevents the Mobile Detector Holder from colliding with a person.**
- **Before positioning the patient at the Mobile Detector Holder apply the brakes.**

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CAUTION

Mobile Detector Holder may tilt over

When extremities are positioned on the horizontally tilted Mobile Detector Holder, the weight must not exceed 20 kg (44 lb).

CAUTION

Mobile Detector Holder may tilt over

If the patient cannot stand without support, the patient may grab the grip of the Mobile Detector Holder. The brakes must be applied.

NOTICE

- A person must not sit on the horizontally tilted Mobile Detector Holder.
- Do not push at the top of the Mobile Detector Holder—the Mobile Detector Holder may fall over. Always use the grip to move and position the Mobile Detector Holder.

Normal Use

With the Mobile Detector Holder you can position the large SkyPlate anywhere in the room for X-ray exposures. You can attach a grid as well. The Mobile Detector Holder supports the large SkyPlate in landscape position only. It also supports X-ray cassettes in 35 cm × 43 cm format (14 in × 17 in).

You cannot use the small SkyPlate (24 cm × 30 cm [10 in × 12 in]) with the Mobile Detector Holder.

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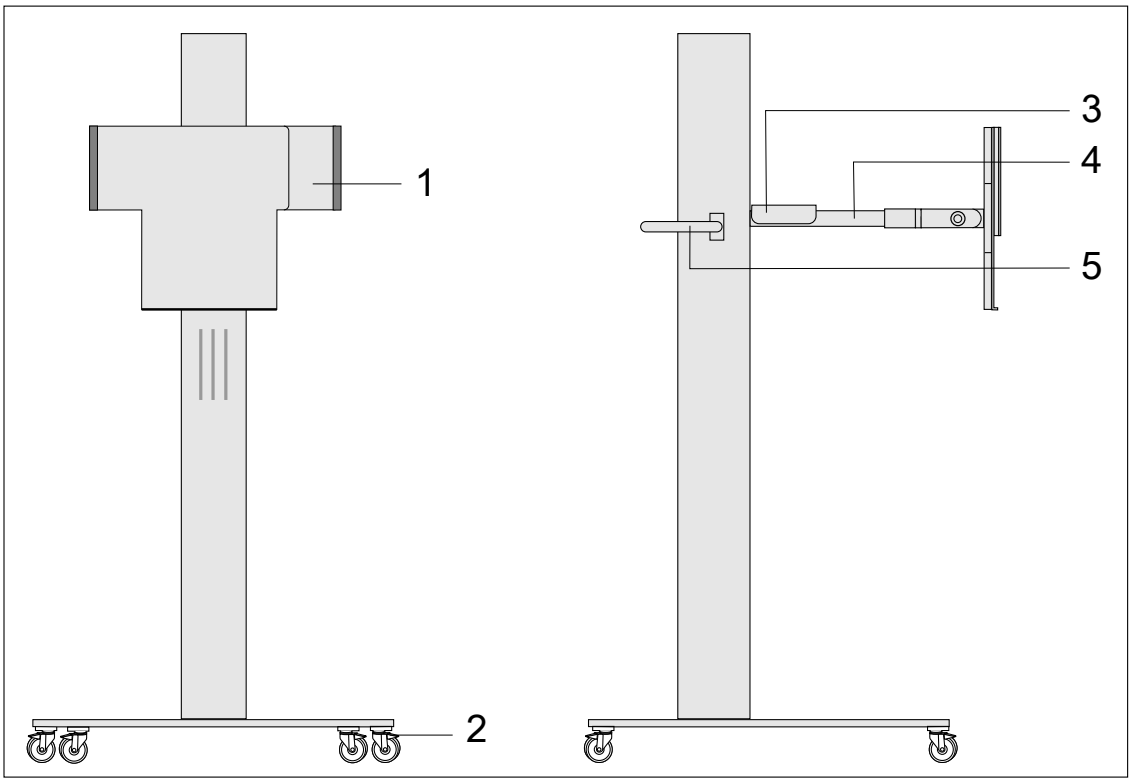
Legend



No.	Meaning
1	Clamp for fixing the detector
2	Wheel brake
3	Release button for vertical movement of the arm
4	Arm
5	Grip for transport and patient support

Installing the Detector on the Mobile Detector Holder

WARNING

Risk of injury or damaged detector

Always hold the detector while opening the clamp. Otherwise it may drop, and a person may get injured or the detector may get damaged.

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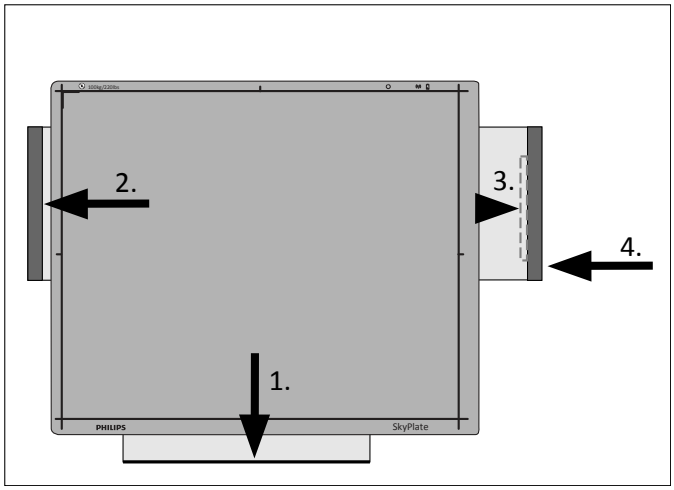
► Put the detector on the Mobile Detector Holder (1). Push the detector to the left border (2). Press the release button at the back of the clamp (3) and push the clamp towards the detector (4) until the detector is fixed.



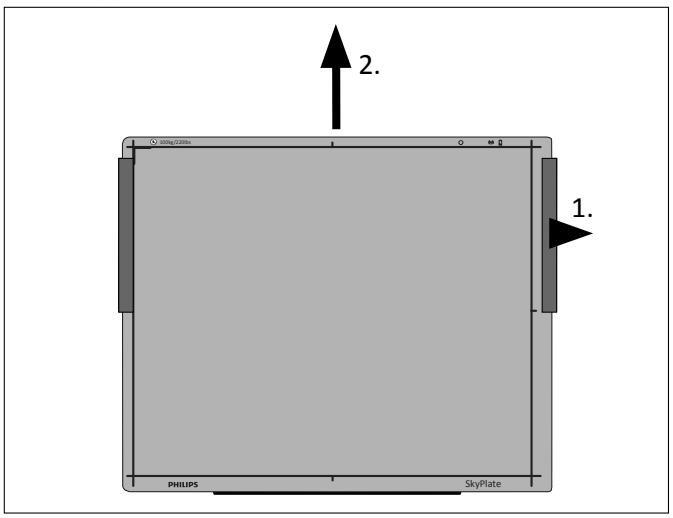
Dismantling the Detector from the Mobile Detector Holder

WARNING

Risk of injury or damaged detector

Always hold the detector while opening the clamp. Otherwise it may drop, and a person may get injured or the detector may get damaged.

► Pull the clamp away from the detector (1). Remove the detector from the Mobile Detector Holder (2).



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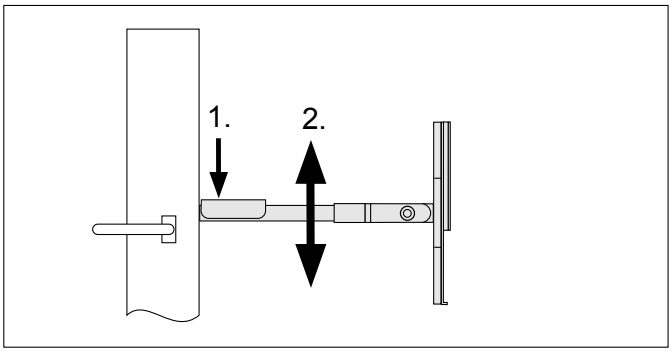
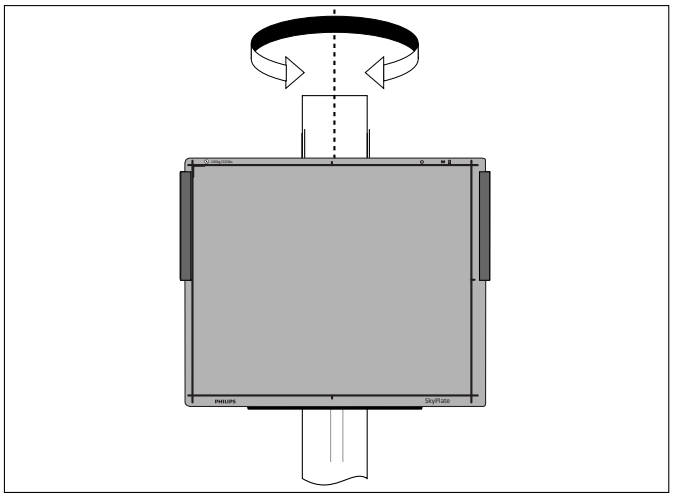
Positioning the Detector

Adjusting the Height of the Arm

► Push and hold the release button (1). Change the height of the arm (2).

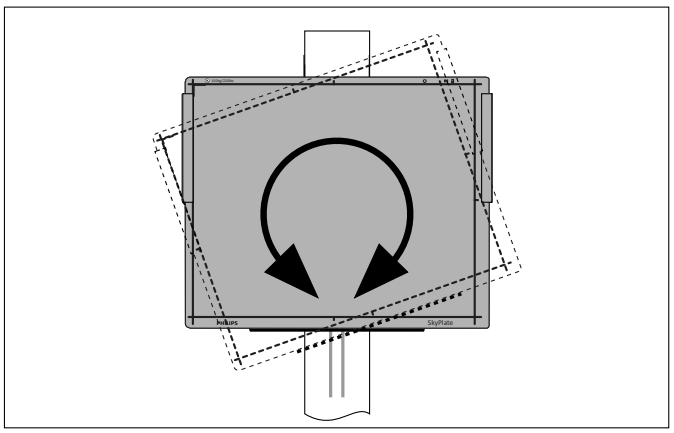


Swiveling the Detector Holder



The detector holder locks in 0-degree position.

Rotating the Detector Holder



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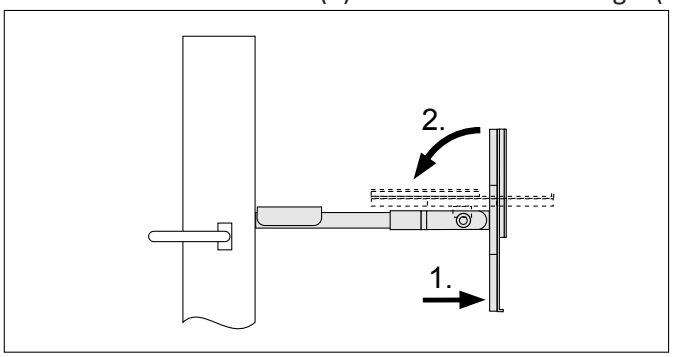
The detector holder locks in portrait and landscape position.

Tilting the Detector Holder

► Press and hold the button (1). Tilt to the desired angle (2).



⇨ The detector holder locks in 0-degree and 90-degree positions.

Technical Data

Length	680 mm (26.8 in)
Width	670 mm (26.4 in)
Height	1507 mm (59.3 in)
Weight	62 kg (136.7 lb)
Vertical movement range of holder arm	68 cm to 128 cm (center of large portable detector) (26.8 in to 50.4 in)

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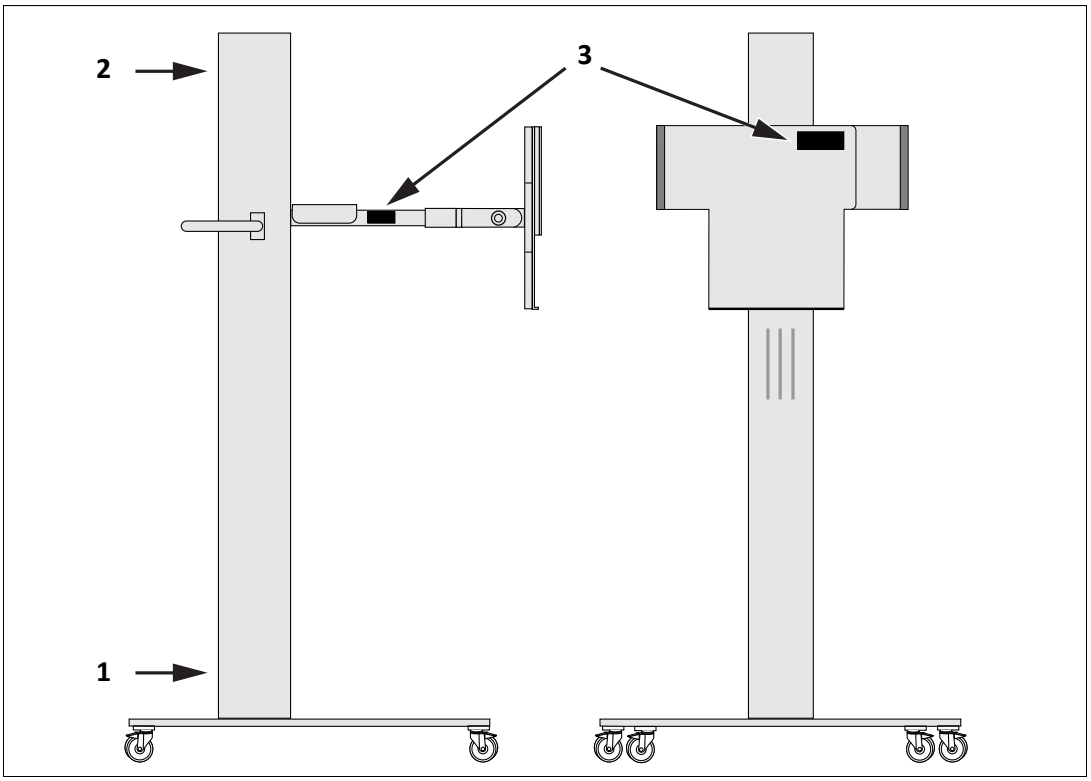
Labels



No.	Contents	Meaning
1		Accessory label
2		Do not push at the top of the Mobile Detector Holder—the Mobile Detector Holder may fall over. Always use the grip to move and position the Mobile Detector Holder.

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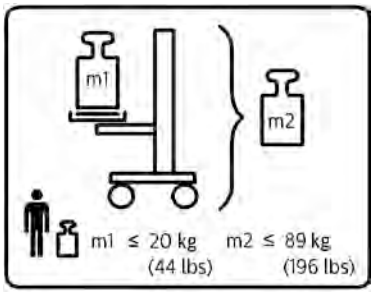
No.	Contents	Meaning
3		A person must not sit on the horizontally tilted Mobile Detector Holder.
		Max. load and weight: • m1 ≤ 20 kg (44 lb): max. patient load on the horizontally tilted Mobile Detector Holder • m2 ≤ 89 kg (196 lb): m1 + weight of the Mobile Detector Holder + weight of the portable detector (including grid)

Detector Holder Patient Bed

Safety Instructions

CAUTION

Be careful when putting the detector holder plate under the patient. Do not squeeze the patient.

WARNING

Fix the detector holder in the bed or on the patient table. When the detector holder is not fixed in the bed or on the patient table, it may fall on the floor, and a person may be injured.

Normal Use

With the detector holder you can position the large SkyPlate on a bed or patient table for X-ray exposures. The SkyPlate can be positioned in portrait or landscape position. The detector holder also supports X-ray cassettes (35 cm × 43 cm [14 in × 17 in]) in portrait and landscape position.

You cannot use the small SkyPlate (24 cm × 30 cm [10 in × 12 in]) with the detector holder.

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Prohibited Use

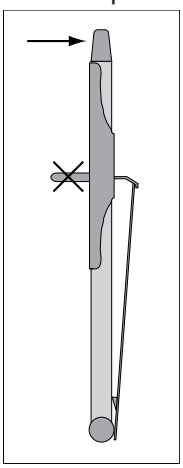
WARNING

Do not use as a patient support

The patient shall not lean against the detector holder.

NOTICE

For transport and positioning, use the grip on top of the detector holder.



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Legend

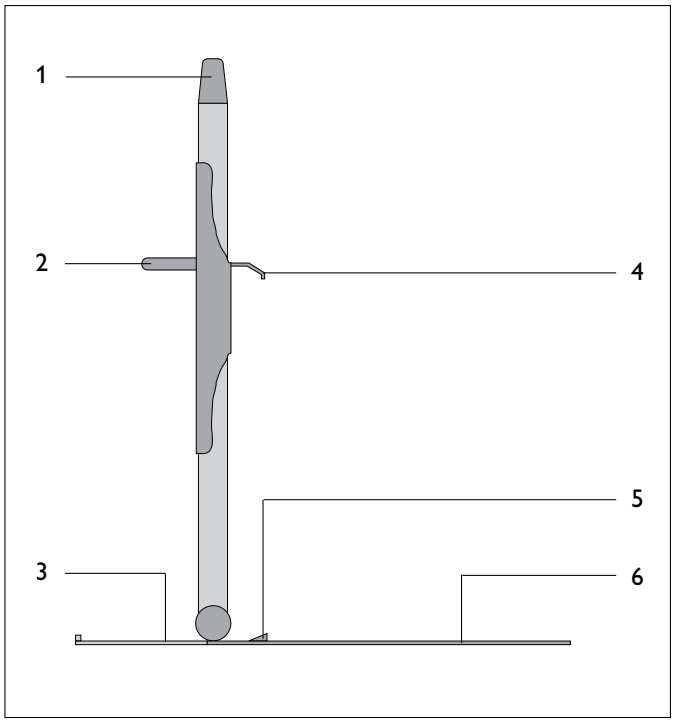

Fig. 47: Detector Holder Patient Bed

No.	Meaning
1	Grip for transport and positioning
2	Grip for vertical movement of the detector fixation (4)
3	Tilt protection
4	Detector fixation
5	Detector fixation
6	This plate is positioned under the patient.

Tilt Protection

NOTICE

Before positioning the detector holder, decide whether to use the tilt protection or not. It might be inconvenient to pull out or insert the tilt protection after positioning the detector holder.

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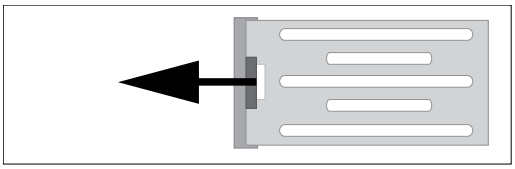
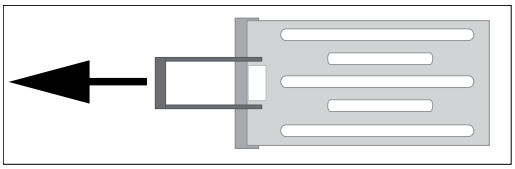
Pulling Out the Tilt Protection

► Pull the grip at the bottom side of the plate.

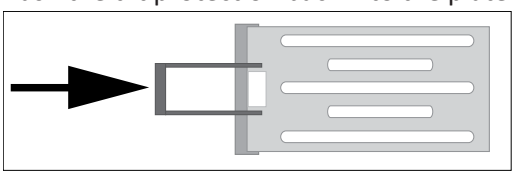


► Completely pull out the tilt protection.



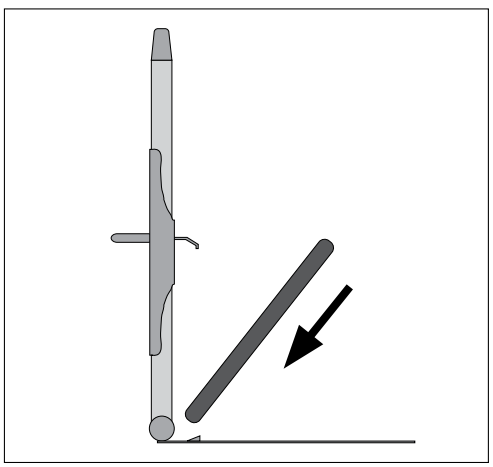
Inserting the Tilt Protection

► Push the tilt protection back into the plate.



Installing the Detector

1



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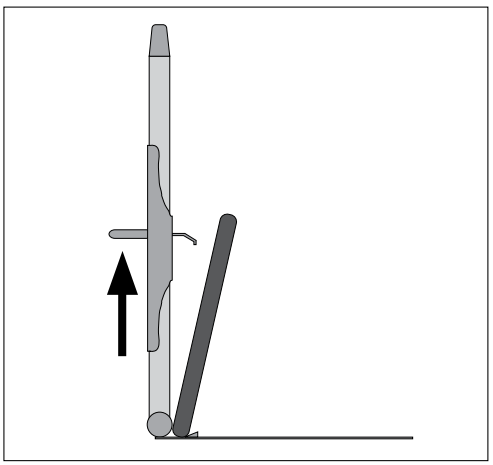
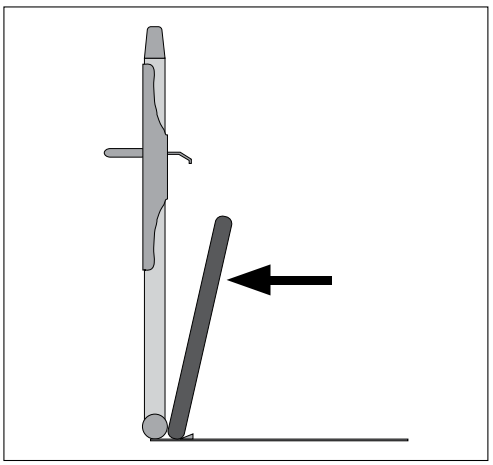
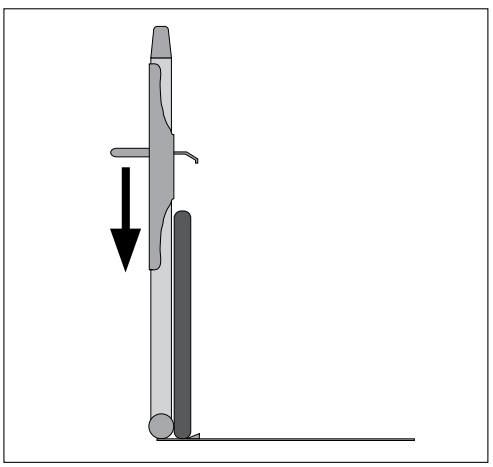
2



3



4



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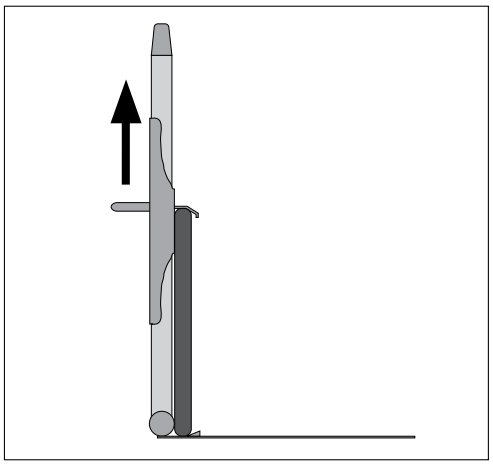
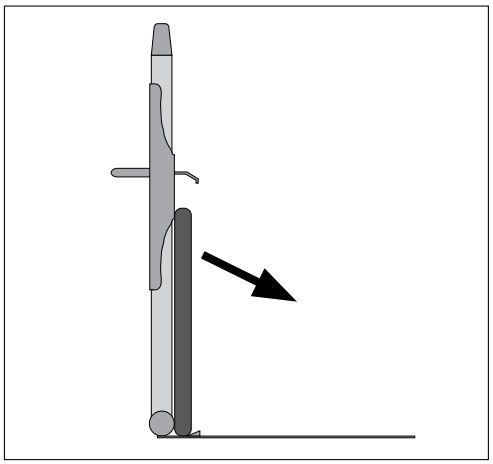
Dismantling the Detector

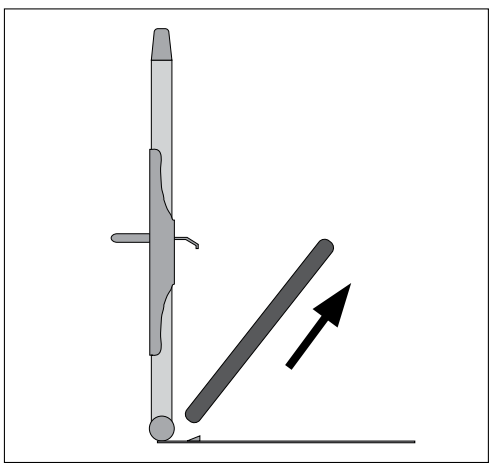
1



2



3



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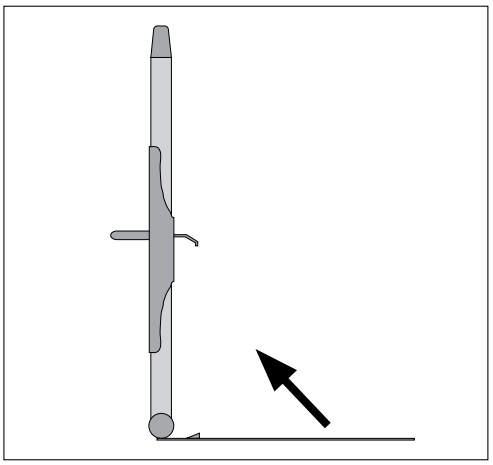
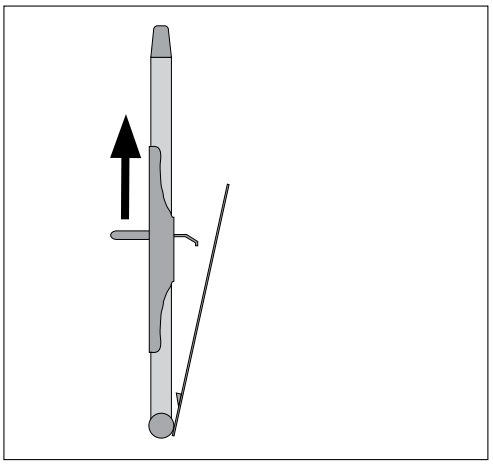
Park Position

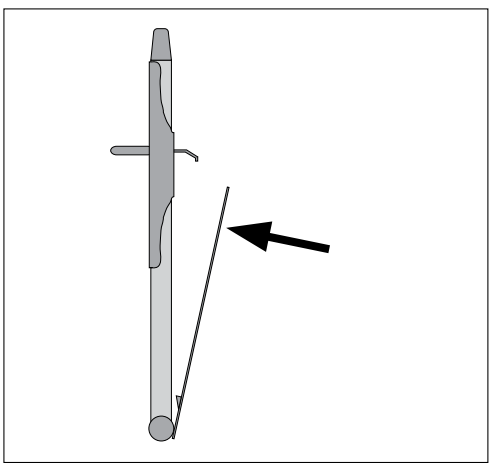
1



2



3



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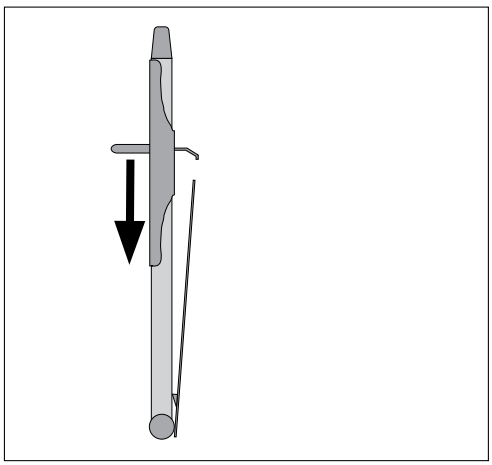
4



Technical Data

Length	415 mm (16.3 in)
Width	230 mm (9.1 in)
Height	720 mm (28.4 in)
Weight	4.5 kg (9.9 lb)

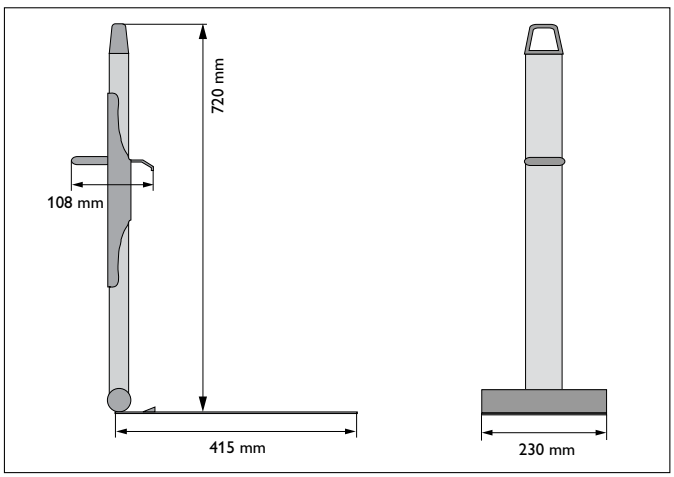


Fig. 48: Dimensions of the detector holder

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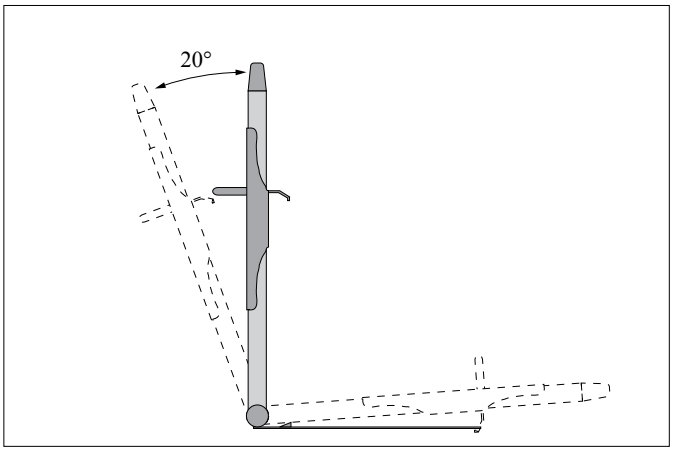
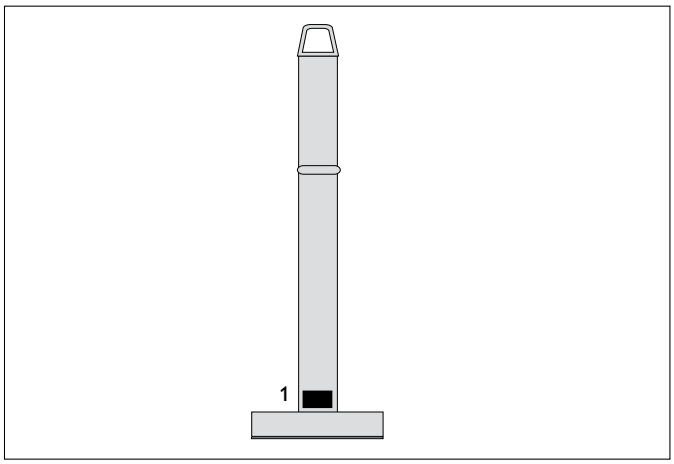


Fig. 49: Movement range of the detector holder

Labels



No.	Contents	Meaning
1		Accessory label

Portable Panel Protector

Safety Instructions

CAUTION

Risk of damage

When the patient weighs more than 226 kg (500 lb), do not use the panel protector.

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Normal Use

WARNING

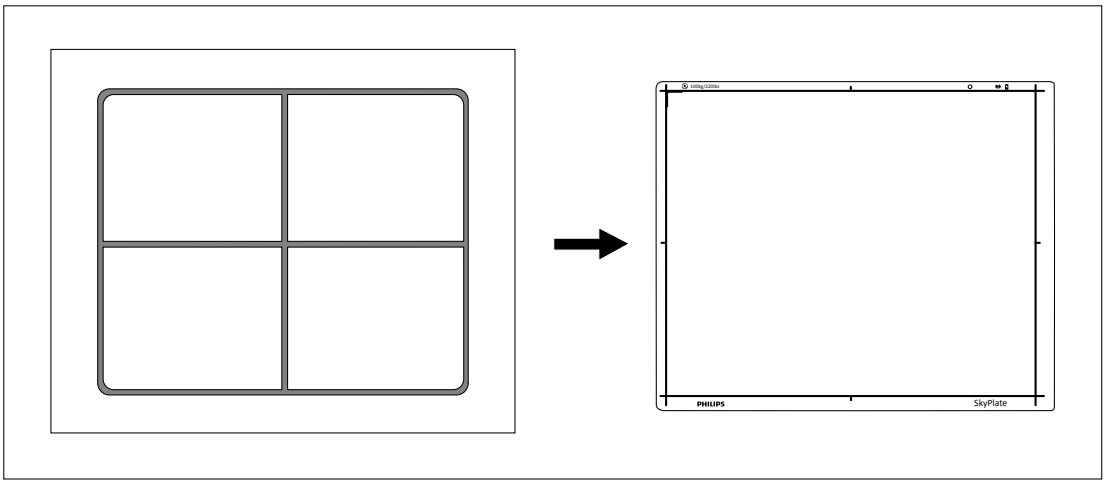
Risk of tripping

After each examination remove the panel protector from the floor.

The panel protector is designed to protect the large SkyPlate when patient who exceeds 100 kg (220 lb) stands on it. The panel protector can be used only without a grid. Do not use the panel protector with the small SkyPlate.

Positioning the Panel Protector on the Detector

- Remove the grid.
- Position the panel protector on the large detector as shown in the following figure.



Technical Data

Length	507 mm (20 in)
Width	431 mm (17 in)
Height	50 mm (2 in)
Weight	2.7 kg (6 lb)
Al equivalent	< 1.1 mm

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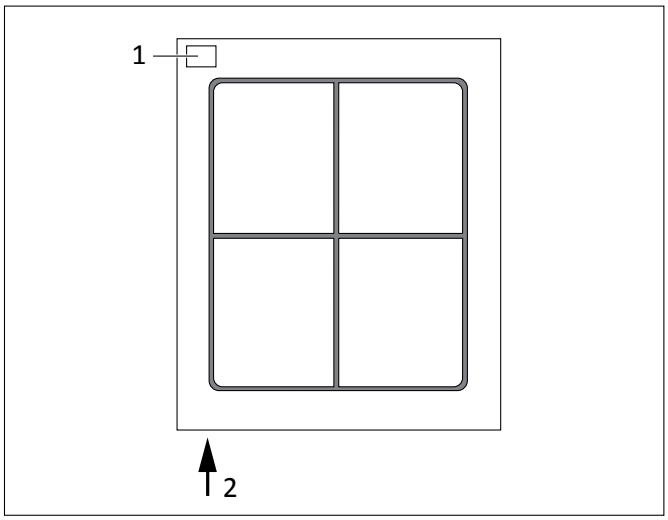
Labels



No.	Contents	Meaning
1		Maximum load
2		Accessory label

Detector Handle

Normal Use

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The detector handle can be used as a support during examination, for example, for placing the large SkyPlate below the patient. If you want to carry the large SkyPlate, you can use the detector handle as well. Do not use the detector handle with the small SkyPlate.

When the patient weighs more than 100 kg (220 lb), do not use the detector handle.

Installing the Handle

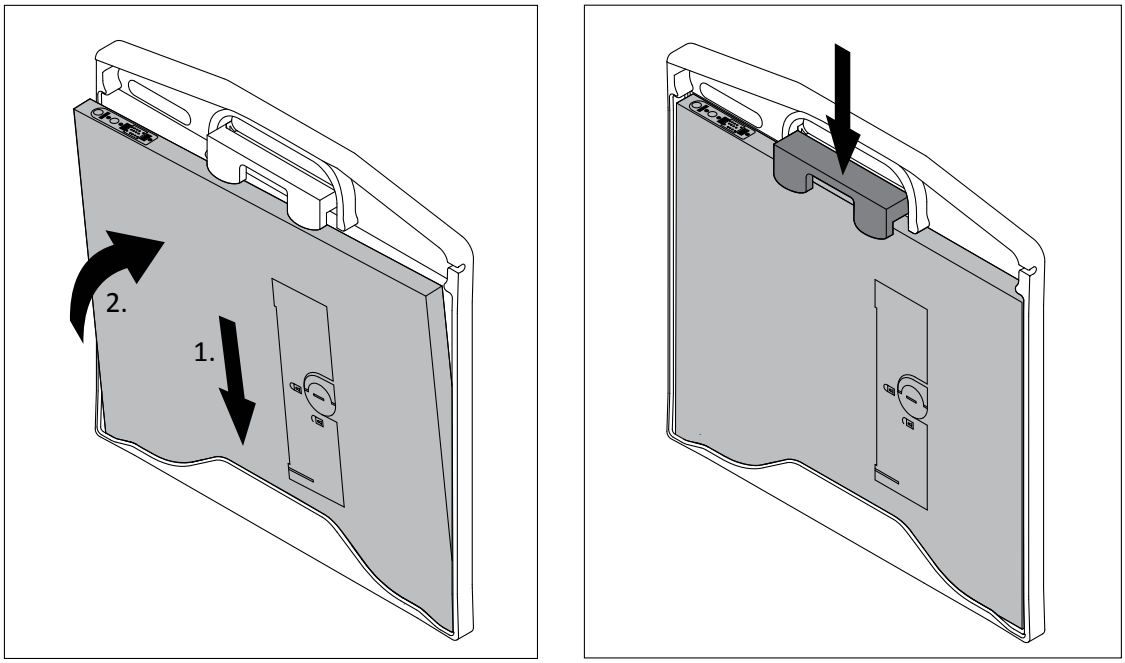
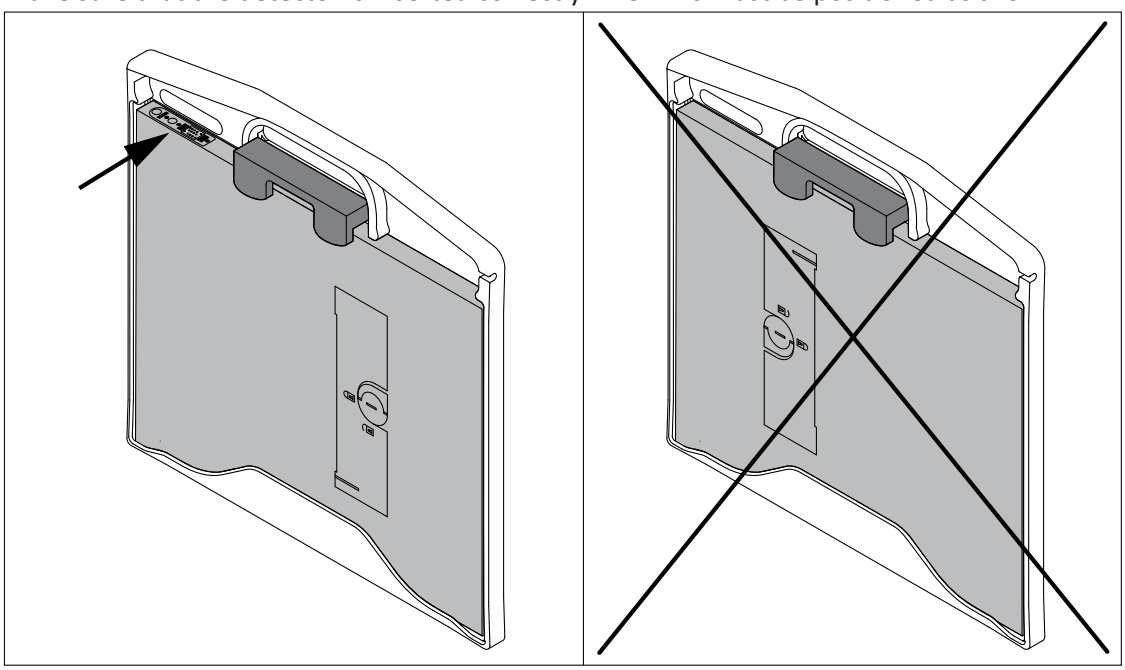


Fig. 50: Inserting the detector into the handle frame

Make sure that the detector is inserted correctly. The LEDs must be positioned as shown:



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Dismantling the Handle

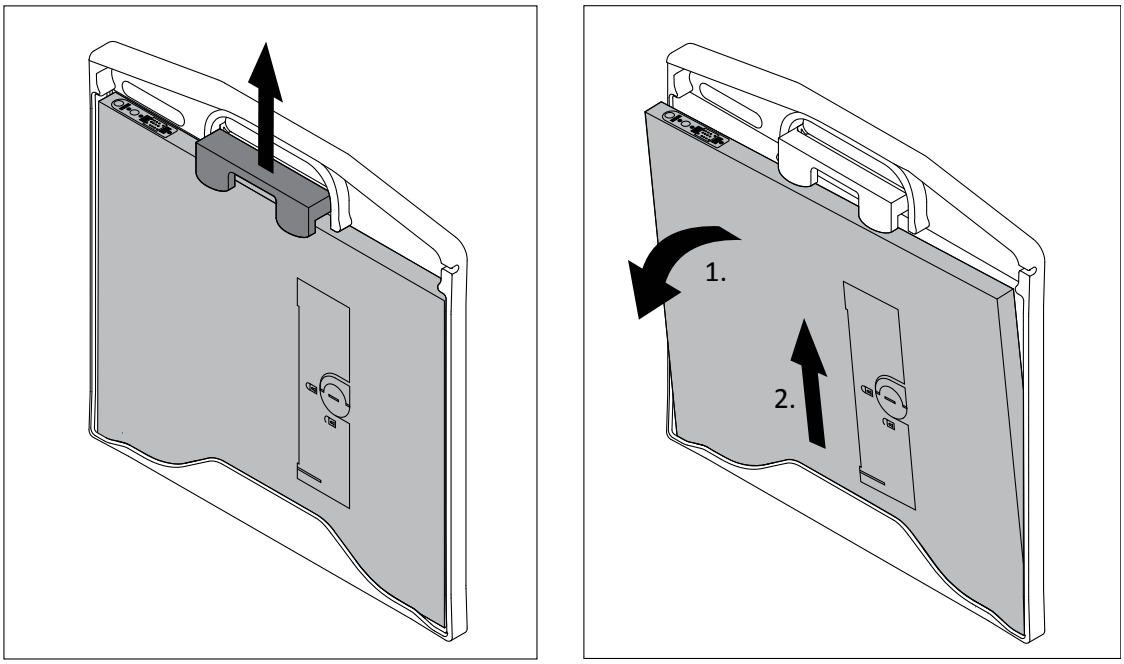

Fig. 51: Removing the detector from the handle frame

Technical Data

Dimensions	468 mm × 476 mm × 27 mm (18.4 in × 18.8 in × 1.1 in)
Weight	1 kg (2.2 lb)
Al equivalent	0.7 mm

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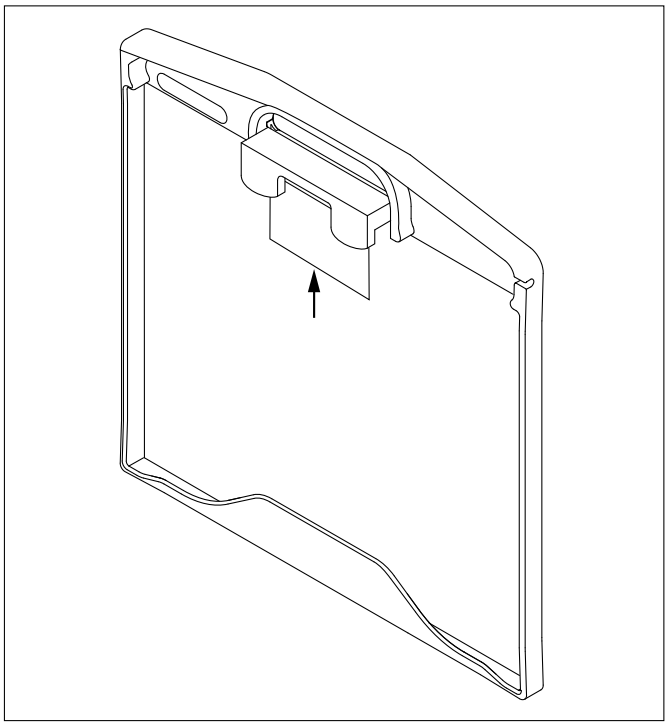
Labels



Label	Meaning
	Accessory label

WPD Hygienic Bags

Safety Instructions

WARNING

Risk of slipping

- **Make sure that no empty WPD bag lies on the floor. A person may slip on it.**
- **After exposure, remove the detector from the bag and do not leave them lying on the floor.**

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CAUTION

Before each exposure, be sure there are no folds in the WPD bag. Folds may cause a distorted image or artifacts in the image. This may result in a misleading diagnosis, or it may result in the need for a retake.

NOTICE

Use only Philips WPD bags with Philips portable detectors. The WPD bags are hygienic bags that have been tested and approved for use with portable detectors. The WPD bags ensure safe use, high image quality and reduce the risk of damage for the wireless portable detector and the system. Other bags may create an electrostatic charge which could then damage the portable detector or the system, or impair image quality. Contact Philips to order Philips WPD bags.

Normal Use

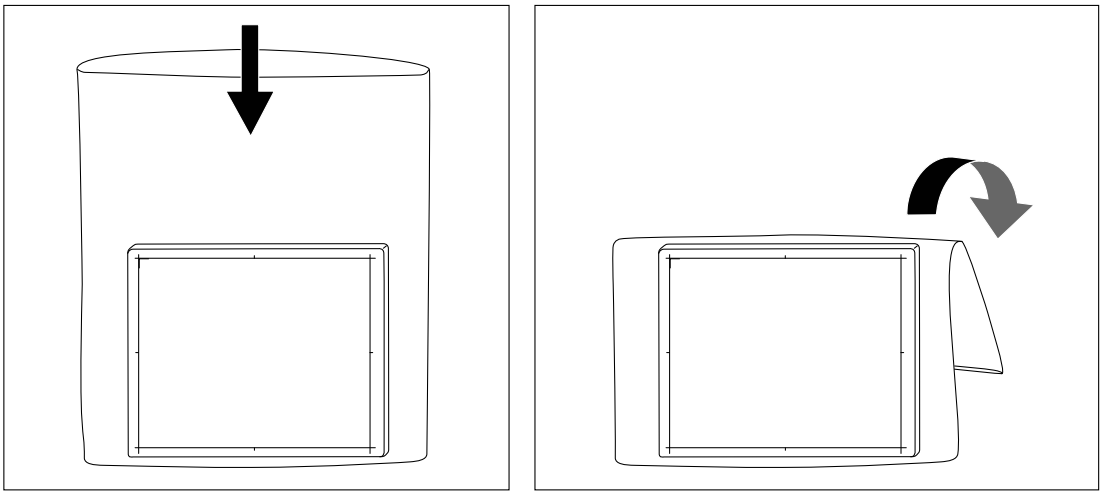
The WPD bags protect the detector from dirt and germs.

The WPD bags are intended only for single use.

NOTICE

Insert the detector into the bag so that the printing on the bag is located on the rear side of the detector. Otherwise it may cause a distorted image or image artifacts.

- Insert the detector into the WPD bag and fold the bag backwards.



- Remove the detector directly after use.

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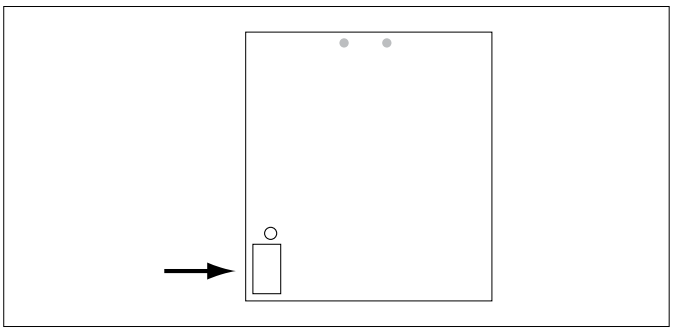
► Dispose of the WPD bags appropriately after use.

Do not dispose of the WPD bags in normal industrial or domestic waste.

Technical Data

	Large for detector 35 cm × 43 cm (14 in × 17 in)	Small for detector 24 cm × 30 cm (10 in × 12 in)
Length	approx. 670 mm (26.4 in)	approx. 460 mm (18.1 in)
Width	approx. 590 mm (23.2 in)	approx. 420 mm (16.5 in)
Weight	40 g (1.4 oz)	30 g (1.1 oz)
Al equivalent	<0.01 mm	<0.01 mm

Labels



Contents	Contents
	Accessory label
	

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9 Appendix

Messages on the Control Console

NOTICE

The codes of the resettable messages are marked with an asterisk.

Code	Message
	Collimator closed
	Collimator filter out of position
	Collimator not at 0°
	Connector X120 (ceiling safety) open
	Connector X119 (safety barrier) open
	CS being outside of safety region
	Entrapment device activated
	Grid in movement
	Limit reached
	Possible collision. Change position.
	Scanning limit
	Scanning out of range
	Scan out of limit
	Start-up. Please wait
	Tabletop safety barrier active
	Tube not at 0°
80	General emergency
82	Anti-pinching circuit broken
83 (*)	Grid 2 disabled
88 (*)	The SID is incorrect
89 (*)	The minimum calibration was not carried out
90	EEPROM data damaged

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Code	Message
91 (*)	The angulation movement has exceeded the maximum error
92 (*)	The scan movement has exceeded the maximum error
93 (*)	Main beam movement over max error
94 (*)	Middle beam movement over max error
99	Inverter fault
101	Angulation potentiometer under the minimum
102	Angulation potentiometer over the maximum
103	Scan potentiometer under the minimum
104	Scan potentiometer over the maximum
105	Main beam potentiometer under min
106	Main beam potentiometer over max
107	Middle beam potentiometer under min
108	Middle beam potentiometer over max
111	Transversal table top potentiometer is under the minimum
112	Transversal table top potentiometer over the maximum
113	SID potentiometer under the minimum
114	SID potentiometer over the maximum
117	Width collimator potentiometer under the minimum
118	Width collimator potentiometer over the maximum
119	Height collimator potentiometer under the minimum
120	Height collimator potentiometer over the maximum
123	Compression force potentiometer is under the minimum
124	Compression force potentiometer is over the maximum
125	Grid 1 potentiometer under the minimum
126	Grid 1 potentiometer over the maximum
127	Grid 2 potentiometer under the minimum
128	Grid 2 potentiometer over the maximum
133 (*)	The angulation potentiometer max is lower than min
134 (*)	The scan potentiometer max is lower than min
135 (*)	The main beam potentiometer max is lower than min
136 (*)	The middle beam potentiometer max is lower than min

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Code	Message
138 (*)	The transversal table top potentiometer max is lower than min
139 (*)	The SID potentiometer max is lower than min
141 (*)	The max of the width collimator potentiometer is less than the min
142 (*)	The max of the height collimator potentiometer is lower than the min
144 (*)	The max of the compression force potentiometer is lower than the min
145 (*)	The grid 1 potentiometer max is lower than min
146 (*)	The grid 2 potentiometer max is lower than min
156	Serial line: time-out from Supervis. to main µP
157	Serial line: time-out from main µP to Supervis.
158	Single Fault open at start-up
159	Input closed at start-up
160	Single fault open SID up=1 / bit serial 0=0
161	Single fault open SID up=0 / bit serial 0=1
162	Single fault open SID down=1 / bit serial 1=0
163	Single fault open SID down=0 / bit serial 1=1
164	Single fault open table top in=1 / bit serial 2=0
165	Single fault open table top in=0 / bit serial 2=1
166	Single fault open table top out=1 / bit serial 3=0
167	Single fault open table top out=0 / bit serial 3=1
168	Single fault open compressor up=1 / bit serial 4=0
169	Single fault open compressor up=0 / bit serial 4=1
170	Single fault open compressor down=1 / bit serial 5=0
171	Single fault open compressor down=0 / bit serial 5=1
172	Single fault open A5 invert. enable=1/serial bit 6=0
173	Single fault open A5 invert. enable=0/serial bit 6=1
174	Single fault open A6 invert. enable=1/serial bit 7=0
175	Single fault open A6 invert. enable=0/serial bit 7=1
180	Single fault closed / SID up=1
181	Single fault closed / SID down=1
182	Single fault closed / table top in=1
183	Single fault closed / table top out=1

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Code	Message
184	Single fault closed / compressor up=1
185	Single fault closed / compressor down=1
186	Single fault closed / inverter control A5=1
187	Single fault closed / inverter control A6=1
191	The angulation potentiometer does not move with the control active
192	Scanning potentiometer not in movement with active output
193	Main beam potentiometer not in movement with active output
194	Middle beam potentiometer not in movement with active output
201	Angulation potentiometer in movement without request
202	Scan potentiometer in movement without request
203	Main beam potentiometer in movement without request
204	Middle beam potentiometer in movement without request
206	Transversal table top potentiometer in movement without request
207	SID potentiometer in movement without request
212	Compression force potentiometer in movement without request
213	Grid 1 potentiometer in movement without request
214	Grid 2 potentiometer in movement without request
218	Transversal table top movement over the maximum error
220	SID movement over the maximum error
226	Compressor down output active without feedback input
227	Compressor outputs not active with feedback active
228	Compressor up output active without feedback input
231	Single Fault open without active inputs
232	Single Fault closed with active inputs
301	Grid 1 movement time-out
302	Grid 2 movement time-out
500	RAM-EEPROM: failure to recognize data
501	RAM-EEPROM: script time-out
502	RAM-EEPROM: comparison failed
503	RAM-EEPROM: eeprom read error
907 (*)	Key or joystick active on start-up

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Code	Message
910	CAN line Time-out from the console to the main µP
961	FLASH-EPROM: cancellation failed
962	FLASH-EPROM writing failed
999	The RAM has lost the data. check batteries

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Messages at the Eleva Tube Head

Some of these messages require confirmation.

Message	Possible causes	What can be done
2nd tube enters safe zone	The user has moved the ceiling suspension away from the table. In this position the table can be moved without danger of collision.	-
2nd tube leaves safe zone	The ceiling suspension has entered the table zone. In this position the table cannot be moved to avoid collision.	-
A button ("...") sticks at the control handle. Press the sticking button several times to make it operate again. Call service, if the button continuously causes problems.	Upon start-up, a continuously active button has been detected at the X-ray tube control handle. The corresponding function cannot be executed.	Press the sticking button several times to make it operate again. Call service, if the button continuously causes problems.
A grid is inserted!	-	-
A grid is put on!	The exposure program is set for using no grid, but a grid is put on the portable detector.	Remove the grid or adapt the technique factors accordingly.
Alignment is not possible. Move CS swing into a lock position.	The image receptor cannot be aligned to the X-ray source when the ceiling suspension X-ray source arm rotation is not locked.	Lock X-ray source arm rotation in normal position.
Alignment is not possible. Move the CS into a lateral lock position.	The image receptor cannot be aligned to the X-ray source when the ceiling suspension is not locked in lateral direction (marked blue).	Move the ceiling suspension into a lateral lock position.
Area Scan - no auxiliary selection possible	The selected special procedure program for Area Scan can only be used with auxiliary Fluoroscopy and spot images.	Select a different exposure program.
Automatic tube tracking has switched off.	The tracking servo drive has switched off, possibly because the operating range was left or because of a collision.	Tracking can be switched on again if the reason for automatic switch-off is no longer present.
A wrong antiscatter grid has been inserted! It will not be possible to remove grid line artifacts from the image.	The inserted anti scatter grid line density is not compatible with the grid line removal algorithm.	Exchange the grid.
CALL SERVICE - Bucky wall stand error!	-	-
CALL SERVICE - Ceiling suspension motor drive error!	-	-

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Message	Possible causes	What can be done
CALL SERVICE - Collimator error	The image receptor cannot be aligned to the X-ray source because of a collimator error.	Call service immediately!*
CALL SERVICE - CS source collimator error!	-	-
CALL SERVICE - CS source radiation filter error!	-	-
CALL SERVICE - Error in the examination programming database	An error occurred in the examination programming database.	Call service.
CALL SERVICE - Invalid application selected!	The selected application data set is invalid and cannot be used.	Try to select a different application. Call service immediately!
CALL SERVICE - Invalid exposure program!	The selected exposure program data set is invalid and cannot be used.	Try to select a different exposure program. Call service immediately!
CALL SERVICE - Invalid patient thickness correction!	The selected patient thickness data set is invalid and cannot be used.	Try to select a different exposure program or patient thickness. Call service immediately!
CALL SERVICE - Malware found! Ask Philips customer support for further assistance. System functionality might be affected.	The virus scanner has found a suspect item that might be infected.	Call service immediately!*
CALL SERVICE - No connection to the examination programming database	-	-
CALL SERVICE - Servo is not calibrated.	Tracking is in standby (temporarily switched off) because the ceiling suspension drives are not (yet) calibrated.	Wait for successful calibration. If that does not help, call service.
CALL SERVICE - System error!	There is a malfunction in the system.	Call service. *
CALL SERVICE - The selected focal spot has not been adapted!	The selected focal spot has not yet been adapted. This may result in prolonged preparation time and inaccurate X-ray technique factors.	Call service immediately!*
CALL SERVICE - Tube control handle error!	-	-
CALL SERVICE - Wall stand Bucky unit error!	An error has occurred in the wall stand Bucky unit.	Call service immediately!*
CALL SERVICE - X-ray generator error!	An error has occurred in the generator.	Call service immediately!*
Cannot execute request - other device selected!	While another auxiliary is active, most functions at the X-ray source control grip are disabled.	Select an exposure program or auxiliary for the ceiling suspended X-ray source.
Ceiling suspension has reached its park position	The X-ray source is now located in the parking position. The unrestricted use of other movements should now be possible.	-

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Message	Possible causes	What can be done
Collimation restriction is off	The collimator key switch is set to emergency operation. Automatic collimator functionality is disabled.	Make sure that all collimator and filter settings are correct! All settings are under operator's control only and the system will not check for correctness or consistency.
Collimator lamp is too hot	The collimator housing is too hot, because of prolonged use of the light field indicator.	Do not touch housing! Try to avoid using the light too often.
Collision danger - Detector directly above the tabletop	An automatic detector movement is not possible because the VM detector is positioned above the tabletop. There is a danger of detector - table collision.	Move the detector using the normal movement functions.
Collision danger - table too low	An automatic movement is prematurely stopped because there is a collision danger with the detector and the table. The target position cannot be reached.	Change, for example, the table height and try again.
Collision detected at the wallstand - Movement not possible.	The wall stand cover is pressed.	Make sure to release the wall stand cover.
Collision detected - Brakes released. Move system out of collision and click OK afterwards.	A collision happened during a geometry position movement. The brakes of the ceiling suspension have been released and the automatic movement has been disabled. The ceiling suspension can be moved manually now.	Move the system out of collision. Then click OK to engage the brakes and to enable the automatic movement.
Communication problem with control handle display	Communication issue between control handle display and Eleva Workspot. The displayed data may be incorrect.	Reselect the patient or restart the system. If the problem persists, call service.
Communication problem with the control handle display. Reselect the patient or restart the system. If the problem persists, call service.	Communication issue between control handle display and Eleva Workspot. The displayed data may be incorrect.	Reselect the patient or restart the system. If the problem persists, call service.
Confirm the message to start a new reference run.	The Bucky tray reference run could not be successfully completed.	Remove any obstacles. Press any key respectively confirm the message on the X-ray source control handle to start another reference run (max. no. of retries: 2).
CS longitudinal movement error - move into center lock position.	Some automatic movements are only possible after the ceiling suspension longitudinal drive has been self-calibrating against a reference position.	Manually move the X-ray source longitudinal movement into the center lock position (table center) once after startup.
Detector armswing position must be locked in 0° position	Wall stand tilting is inhibited while the detector arm swing is not locked into 0°.	Lock the arm swing in 0° position before tilting.

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Message	Possible causes	What can be done
Detector armswing position must be locked in 90° position	Wall stand automatic movement into a lateral cross-table position is inhibited while the detector arm swing is not locked into 90°.	Lock the arm swing in 90° position before moving into the cross-table position.
Drive error: Ceiling suspension	A ceiling suspension drive has a technical problem.	Try a system restart. If the problem persists, call service!
Drive error: Table	A table drive has a technical problem.	Try a system restart. If the problem persists, call service!
Drive error: Wallstand	A wall stand drive has a technical problem.	Try a system restart. If the problem persists, call service!
Due to an increased difference of the detector temperature between calibration "..." and current state "...", technical artefacts may occur. To avoid possible artefacts, please wait until the detector temperature is in range or perform a new calibration with the current detector temperature.	The detector temperature is outside the recommended calibration temperature range.	Go to System – Portable detector. In the table, compare the calibration temperature range with the current temperature. It is recommended to wait until the detector temperature is in range.
ERROR: Automatic tube/receptor alignment not possible	The image receptor cannot be aligned to the X-ray source because of a technical error: the corresponding detector or collimator position information is not available.	Align manually. Call service.
ERROR: Grid is not armed. Pull out tray and push back.	The grid is not armed and cannot move, consequently an exposure cannot be started.	In order to arm the grid, completely pull-out the cassette tray and push it back in.
ERROR: Grid is not moving. Remove and re-insert grid.	The grid could not move, consequently an exposure could not be started.	Remove and re-insert the grid. If the problem persists, call service.
ERROR - The acquisition parameter display values are not up to date or there is no display of values possible at this console!	The main console display is not operable or does not display actual values.	Call service immediately!
Exposure: Please try again!	The unit is now ready for radiography.	Let go of the radiography switch and press it again to start exposures.
Geometry movement is not possible. Remove the stretch grip.	The stretch grip is plugged into the wall stand and a geometry movement is requested.	Remove the stretch grip from the wall stand.
Geometry position has been reached.	A geometry position movement has reached the selected position.	-
Geometry position is not adjusted.	The geometry position assigned to this view and auxiliary combination has not been adjusted yet.	Contact the advanced user.

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Message	Possible causes	What can be done
Grid is missing!	The exposure program is set for using a grid, but no grid is mounted on the portable detector.	Mount a grid or adapt the technique factors accordingly.
Initialize the remote control by pressing any key.	The user tries to start an automatic movement the first time after system start-up without initializing the remote control. The remote control needs to be initialized to ensure that the deadman switch is working correctly.	Press any key on the remote control to initialize it. Do not press the deadman switch!
Key has currently no function.	No function is currently assigned to the button you have pressed.	-
Measure the SID manually	The SID is unknown to the system or might have changed.	Measure the SID using the tape measure for correct indication of X-ray field size.
Movement aborted: Beam center outside usable range	An automatic detector beam alignment movement was aborted because the target position is outside the useful table length range.	Adjust the beam center position and try again.
Movement aborted: tabletop or patient area blocks movement path	An automatic detector movement was aborted because of a danger of collision with the tabletop or with a patient who might be lying on the table.	Move the detector or the table using the normal movement functions.
Move the X-ray source into a longitudinal lock position.	The image receptor cannot be aligned to the X-ray source when the ceiling suspension is not locked in longitudinal direction (marked green).	Move the ceiling suspension into a longitudinal lock position.
No alignment - detector is tilted	The image receptor cannot be aligned to the X-ray source because the wall stand is not in the exact horizontal or vertical position.	Tilt wall stand into horizontal or vertical position.
No alignment - detector swing is not locked	The image receptor cannot be aligned to the X-ray source because the wall stand swing movement is not locked in center position.	Lock detector in center swing position.
No alignment - target position out of movement range	The image receptor cannot be aligned to the X-ray source because the target position is out of the movement range.	Correct X-ray source position or tilt angle.
No alignment - tube is tilted too far	The image receptor cannot be aligned to the X-ray source because the beam angle is more than 45° from perpendicular.	Reduce X-ray source assembly tilt angle relative to the image receptor.

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Message	Possible causes	What can be done
No geometry position has been assigned.	No geometry position has been assigned for this view and auxiliary combination in the EVA tool.	Contact the advanced user.
No grid in use! Check whether SkyFlow is applied.	The SkyFlow license is present within the system. The exposure program is set for using a grid, but no grid is mounted on the portable detector.	Mount a grid or make sure that SkyFlow is switched on.
No movement - EMERGENCY STOP switch is pressed	The movement stop switch has been pressed. No motorised movements are possible anymore.	Pull the STOP switch to enable the movements again.
No stitching run possible - collimator keyswitch is activated	You cannot release a stitching run or test run, because the collimator key switch is set to emergency operation, for example, automatic collimator functionality is disabled.	Set the collimator key switch to normal.
No table movement – 2nd tube is not in safe zone	The user requests a specific table movement. The specific table movement is currently disabled because the ceiling suspension is near to the table zone.	Move the ceiling suspension into the safe zone.
NOT READY - A cassette is still inside the wallstand.	You cannot release exposures on table Bucky or free cassette auxiliaries because there (still) is a cassette inside the wall Bucky stand. The wrong device might be selected.	Remove cassette from wall Bucky stand or select the correct auxiliary.
NOT READY - AMPLIMAT chambers are not hit by the radiation field	You cannot release AEC exposures because the X-ray field does not cover any AMPLIMAT field.	Change field size and/or alignment or use manual exposure techniques.
NOT READY - Bucky tray still open	You cannot release exposure because the Bucky tray is not completely closed for the selected device.	Close the Bucky tray.
NOT READY - Bucky wall stand error	You cannot release exposure because there is an error inside the wall Bucky stand subsystem.	Call service.
NOT READY - Cannot release X-ray for this device from that switch	You cannot release exposure or fluoroscopy for the ceiling suspended X-ray source from the spot image device controls.	CS source X-ray operation can only be released from the control room area.
NOT READY - Cannot release X-ray for this device here	You cannot release exposure or fluoroscopy for the main X-ray source from the CS source controls.	Main source X-ray operation can only be released from the spot image device and corresponding foot switches.

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Message	Possible causes	What can be done
NOT READY - Cassette missing or tray open	You cannot release an exposure because no cassette has been inserted into the selected device, or the Bucky tray has not been closed. Also, the wrong device might have been selected.	Insert the cassette into the selected device. Make sure that the Bucky tray is closed.
NOT READY - Ceiling suspension motor drive error	Because of an error in the ceiling suspension drives you cannot release tomography exposure, a stitching run, or a corresponding test run.	Call service.
NOT READY - CS beam does not hit the image receptor	You cannot release exposures because the X-ray central beam does not hit the image receptor at all.	Move X-ray source and/or receptor in longitudinal direction until the beam can hit the image receptor.
NOT READY - CS not centered in lateral direction, grid in place	You cannot release exposures because the X-ray source is not correctly centered laterally (transverse) on the image receptor and a grid is inserted. Grid exposures should only be executed with the X-ray source centered on to the grid lines.	Move X-ray source and/or receptor laterally into the correct stop or remove the grid.
NOT READY - CS not centered in lateral direction (marked blue)	You cannot release exposures because the X-ray source is not correctly centered laterally (transverse) on the image receptor.	Move X-ray source and/or receptor laterally into the correct stop.
NOT READY - CS not centered in longitudinal direction, grid in place	You cannot release exposures because the X-ray source is not correctly centered longitudinally on the image receptor and a grid is inserted. Grid exposures should only be executed with the X-ray source centered on to the grid lines.	Move X-ray source and/or receptor longitudinally into the correct stop or remove the grid.
NOT READY - CS not centered in longitudinal direction (marked green)	You cannot release exposures because the X-ray source is not correctly centered longitudinally on the image receptor.	Move X-ray source and/or receptor longitudinally into the correct stop.
NOT READY - CS not locked in lateral direction (marked blue)	You cannot release a stitching run or test run because the X-ray source is not locked in lateral direction (SID).	Move X-ray source lateral into a detent.
NOT READY - CS not locked in longitudinal direction (marked green)	You cannot release a stitching run or test run because the X-ray source is not locked in longitudinal direction (SID).	Move X-ray source longitudinal into a detent.
NOT READY - CS source arm swing movement not locked	You cannot release exposures, a stitching run, or a corresponding test run, because the X-ray source assembly swing movement is not locked.	Move into (correct) lock position.

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Message	Possible causes	What can be done
NOT READY - CS source collimator error	Because of an error in the ceiling suspended X-ray source collimator you cannot release any exposures.	Call service. If your system is equipped with a key switch at the collimator, you might enable emergency operation by operating that keyswitch.
NOT READY - CS source radiation filter error	Because of an error in the ceiling suspended X-ray source collimator filter changer you cannot release any exposures.	Call service. If your system is equipped with a key switch at the collimator, you might enable emergency operation by operating that key switch.
NOT READY - Detector arm swing not locked, grid in place	You cannot release exposures because the image receptor arm swing movement is not locked in center position and a grid is inserted. Grid exposures should only be executed with the X-ray source centered on to the grid lines.	Lock detector in center arm swing position or remove the grid.
NOT READY - Detector error	You cannot release exposure because there is a problem with the flat X-ray detector .	Reboot system. If unsuccessful, call service!
NOT READY - Detector is calibrating	You cannot release exposure because the flat X-ray detector is currently busy calibrating.	Wait for a few seconds and try again.
NOT READY - Detector missing or tray open	You cannot release an exposure because the detector has not been inserted into the selected device, or the Bucky tray has not been closed. Also, the wrong device might have been selected.	Insert the detector into the selected device. Make sure that the Bucky tray is closed.
NOT READY - Detector swing not locked, grid in place	You cannot release exposures because the image receptor swing movement is not locked in center position and a grid is inserted. Grid exposures should only be executed with the X-ray source centered on to the grid lines.	Lock detector in center swing position or remove the grid.
NOT READY - Focal spot distance too small	The SID is set so small that the focal spot to skin distance is definitively too small.	Increase SID.
NOT READY - Grid not correctly inserted	You cannot release exposure because the grid is not completely inserted or is jammed.	Remove and re-insert the grid.
NOT READY- Image receptor not horizontal, wrong auxiliary selected?	You cannot release exposures because the image receptor is in a vertical position while the table auxiliary is selected. The wrong device might be selected.	Tilt the image receptor into a horizontal position or select the correct auxiliary.

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Message	Possible causes	What can be done
NOT READY - Image receptor not vertical, wrong auxiliary selected?	You cannot release exposures because the image receptor is in a horizontal position while the wall Bucky auxiliary is selected. The wrong device might be selected.	Tilt the image receptor into a vertical position or select the correct auxiliary.
NOT READY - Last image was not exposed correctly	Although the last image was not correctly exposed, you have not confirmed the corresponding message.	Confirm the corresponding message on the main examination console.
NOT READY - Last image was overexposed	Although the last image was not correctly exposed, you have not confirmed the corresponding message.	Confirm the corresponding message on the main examination console.
NOT READY - Move CS down	The tube position is too high for stitching on the wallstand.	Move the ceiling suspension down.
NOT READY - Move CS towards table center	The tube position is too far off the table center for stitching on the table.	Move the ceiling suspension towards the table center.
NOT READY - Move CS up	The tube position is too low for stitching on the wall stand.	Move the ceiling suspension up.
NOT READY - Move wallstand detector below table	You cannot release a stitching run or test run, because the vertical stand detector is not positioned below the TH-S table.	Position the detector below the table.
NOT READY - No view selected	-	-
NOT READY - Patient database is full	You cannot release exposure because the patient database is completely filled.	Delete examinations that are no longer needed. Call service, if this happens without obvious reason. Make it a rule to close examinations directly after finishing.
NOT READY - Point source assembly to receptor!	You cannot release exposures because the 2nd beam direction does not match the selected receptor.	Point X-ray source assembly towards selected receptor.
NOT READY - SID sensing error	Because of an error in the X-ray source to table distance sensing circuit you cannot release any exposures.	Call service. If your system is equipped with a key switch at the collimator, you might enable emergency operation by operating that key switch.
NOT READY - SID unknown	You cannot release exposures because the SID is unknown and there is no automatic limitation of field size to receptor size.	Move ceiling suspension into the correct lock. If problem persists, call service. If your system is equipped with a key switch at the collimator, you might enable emergency operation by operating that key switch.
NOT READY - Stitching run not possible. Stretch grip is mounted.	The stretch grip is plugged into the wall stand and a stitching run is requested.	Remove the stretch grip from the wallstand.

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Message	Possible causes	What can be done
NOT READY - SYSTEM ERROR! System needs to be rebooted.	-	-
NOT READY - The cassette has already been exposed	You cannot release exposure because the cassette was not changed after the last exposure.	Change the cassette.
NOT READY - The detector is still inside the wallstand.	You cannot release exposure on a table Bucky or free cassette auxiliary because there (still) is the portable detector inside the wall Bucky tray. The wrong device might be selected.	Remove detector from wall Bucky tray or select the correct auxiliary.
NOT READY - Tube assembly must be set to 0° (vertical beam)	You cannot start a stitching run or test run on the table because the X-ray tube is not exactly pointing downwards.	Adjust tube to vertical.
NOT READY - Tube assembly must be set to 90° (horizontal beam)	You cannot start a stitching run or test run on the vertical stand because the X-ray tube is not exactly pointing horizontal.	Adjust tube to horizontal.
NOT READY - Tube control handle error	Because of an error in the ceiling suspended X-ray source control handle you cannot release any exposures.	Call service.
NOT READY - Wallbucky tray not at fixed position	You cannot release exposures because the wall Bucky tray is tilted into horizontal position but is not in the intended vertical position (lock).	Move wall Bucky tray vertical into locked position.
NOT READY - Wallstand armswing position must be locked.	-	-
NOT READY - Wallstand detector swing must be locked in 0° position.	-	-
NOT READY - Wallstand detector tilt position not suitable	You cannot release a stitching run or test run, because the vertical stand is not tilted to exact horizontal or vertical position.	Tilt the vertical stand detector into vertical position (or into horizontal position for use below the table).
NOT READY - Wallstand detector too close below tabletop	You cannot release a stitching run or test run, because the detector has been moved up too close to the tabletop. The automatic movement needs a certain clearance distance.	Change the table height a little. This will reactivate detector height tracking.
NOT READY - X-ray source still moving	You cannot release exposures since the ceiling suspended X-ray tube height tracking movement is not yet completed.	Wait until the movement is finished or switch off the CS tracking function at the CS control handle.

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Message	Possible causes	What can be done
NOT READY - X-ray source swing movement not locked, grid in place	You cannot release exposure, because the X-ray source assembly swing movement is not locked and a grid is inserted. Grid exposures should only be executed with the X-ray source centered on to the grid lines.	Move X-ray source arm into lock position or remove the grid.
No tube tracking - key switch is enabled	Tracking is switched on while the key switch at the collimator is activated.	Tracking cannot be enabled while the key switch is active.
Now generating image "..." of "..."	Indicating the progress in a stitching run.	-
Number of images: "..."	Indicating the number of images that will be generated in a stitching run.	-
Please wait, no single exposure start allowed for "..."	The X-ray tube is very hot. The message indicates the waiting time until a single exposure may be started.	For continuous tube protection, let tube cool down as needed.
Run aborted by error	A tomography or stitching run or test run was aborted because an error has occurred while moving, for example, a collision.	Manually move the source assembly back into the start position. Retry. If problem persists, call service.
Run aborted by operator	A stitching test run was interrupted, for example, by pressing a brake button for the ceiling suspension.	Manually move the source assembly back into the start position. Do not press any button during a test run, except if you want to stop the run.
Selected geometry position is not reachable.	The geometry position can not be reached.	Check positions of all components.
Stitching - auxiliary not supported	Only corresponding "stitching" auxiliaries can be selected, when a special procedure program for stitching is active. Autostitching is only possible on table or wall stand with digital detector, CR stitching only with free cassette auxiliaries.	Select an appropriate auxiliary. Or select a different exposure program.
Stitching run completed.	The automatic stitching movements are completed.	You may now let go of the exposure hand switch.
Stitching test run aborted	A stitching test run was aborted because one of the following has occurred: - System error (for example, detector error or collision). - The test run was interrupted by the operator (for example, brake released).	Make sure that the system can move freely. Manually move the X-ray tube assembly back into the start position. Start the stitching test run again and do not interrupt it. If the problem persists, call service.
The detector in the wall bucky unit is not attached.	A different portable detector is currently attached to the system.	Attach the appropriate portable detector to the system.

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Message	Possible causes	What can be done
The movement is currently disabled: - The safe zone for the ceiling suspension is not adjusted. - The ceiling suspension position is unknown. After confirmation the table movement is unlocked. Always ensure that there is no collision with the ceiling suspension.	The movement is currently disabled due at least one of the following reasons: - The safe zone for the ceiling suspension is not adjusted. - Due to a technical issue the ceiling suspension position is unknown.	Confirm the user guidance. Afterwards the safe zone supervision is disabled and the table movements are unlocked. Always ensure that there is no collision with the ceiling suspension.
Tilt the X-ray source once into a lock position.	Automatic X-ray source movements can only be executed after the tube tilt drive has been referenced.	Manually put the X-ray source assembly tilt into the horizontal or vertical lock position once after startup. Try again.
Too small SID limits fieldsize	The SID is set so small that the cassette cannot be irradiated at full size.	Increase SID.
Tracking active	Automatic tube tracking is active.	-
Tracking is in standby. Reverse the SID or reactivate tracking.	-	-
Tracking is not possible	Tracking is in standby (temporarily switched off). Vertical tracking is not possible, since there is no image receptor height sensing available.	-
Tracking is not possible. Align manually.	Tracking is in standby (temporarily switched off) because of a technical error: the corresponding detector or collimator position information is not available.	Align manually. Call service.
Tracking is not possible. Cassette is missing.	Tracking is in standby (temporarily switched off) because there is no cassette inserted into the wall stand.	Insert a cassette.
Tracking is not possible. Change the SID.	Tracking is in standby (temporarily switched off) because the X-ray source target position is not reachable.	Move image receptor up or down.
Tracking is not possible. CS arm is not locked.	Tracking is in standby (temporarily switched off) because the ceiling-suspending X-ray source arm rotation is not locked.	Lock X-ray source arm rotation in normal position.
Tracking is not possible. CS is out of range.	Tracking is in standby (temporarily switched off) because a ceiling suspension movement range limit has been reached.	Move image receptor into a better position.
Tracking is not possible. Insert a cassette.	Tracking is in standby (temporarily switched off) because there is no cassette inserted into the wall stand.	Insert a cassette.

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Message	Possible causes	What can be done
Tracking is not possible. Move CS over wall-stand.	Tracking is in standby (temporarily switched off) because the X-ray tube is not centered above the wall stand	Bring the X-ray tube into the locking center position above the wall stand.
Tracking is not possible. Move the CS into a lateral lock position.	Tracking is in standby (temporarily switched off). Tracking with upper or lower alignment is not possible when the ceiling suspension is not locked in lateral direction (marked blue).	Move the ceiling suspension into a lateral lock position.
Tracking is not possible. Move the CS into a longitudinal lock position.	Tracking is in standby (temporarily switched off). Tracking with upper or lower alignment is not possible when the ceiling suspension is not locked in longitudinal direction (marked green).	Move the ceiling suspension into a longitudinal lock position.
Tracking is not possible. Move the tube to horizontal position.	Tracking is in standby (temporarily switched off) because the center beam is not exactly horizontal.	Adjust the X-ray source assembly tilt angle to exact horizontal.
Tracking is not possible. Move the tube to vertical position.	Tracking is in standby (temporarily switched off) because the center beam is not exactly vertical.	Adjust the X-ray source assembly tilt angle to exact vertical.
Tracking is not possible. Swing arm is not locked.	Tracking is in standby (temporarily switched off) because the wall stand swing movement is not locked in center position.	Lock detector in center swing position.
Tracking is not possible. The wallstand is tilted.	Tracking is in standby (temporarily switched off) because the wall stand is not tilted to horizontal or vertical.	Tilt wall stand into horizontal or vertical position.
Tracking is not possible (unknown SID or wrong position).	Tracking is in standby (temporarily switched off). Currently it does not operate, for example, because the X-ray tube position is out of range or the SID must be measured first.	To re-enable tracking, move the X-ray tube into the corresponding position or measure the SID for free cassette operation.
Tracking is only possible with a smaller tilt angle	Tracking is in standby (temporarily switched off) because the center beam is angled more than 45° from the target direction.	Reduce X-ray source assembly tilt angle relative to the image receptor.
Tracking or alignment is not possible. Tray open or detector missing.	Tracking is in standby (temporarily switched off) or alignment is not possible because there is no portable detector inserted into the wall stand or the Bucky tray is open.	Make sure to close the Bucky tray or to insert the portable detector.

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Message	Possible causes	What can be done
TUBE CONTROL HANDLE PROBLEM - key number "..." is sticking!	Upon start-up, a continuously active button has been detected at the 2nd beam control handle. The corresponding function cannot be executed.	Try to have the sticking button operate again by pressing it several times. Press the "Test" key at the control handle to have message disappear. Call service, if the button continuously refuses to operate correctly.
TUBE OVERLOAD - exposure run aborted	The exposure run was aborted because the X-ray tube overload limit was reached.	Observe tube heat status before starting high load exposure runs.
Validating system database. Please wait ...	Some functions may not be available while the system is busy validating a new exposure program data set.	This may take some minutes.
Wallstand: cassette not correctly inserted or invalid cassette size	An invalid cassette size was detected in the wall stand, for example, not inserted centrically.	Remove and re-insert cassette correctly. Only use specified cassettes.
Wallstand: Detector not correctly inserted or invalid size	An invalid detector size was detected in the wall stand, for example, not inserted centrically.	Remove and re-insert the portable detector correctly.
Wallstand armswing position must be locked for any movement	Automatic wallstand movements are inhibited while the detector arm swing is not locked into 0° or 90°.	Lock the arm swing in any of these positions before starting any movement.
Wallstand collision switch active	-	-
Wallstand detector swing position must be locked in 0° position	Wall stand automatic movements and tilting are inhibited while the detector swing axis is not locked into 0°.	Lock the detector swing axis in 0° position before starting such movement.
Wallstand key has no function.	-	-
WALLSTAND PROBLEM - a key is sticking!	Upon start-up, a continuously active button has been detected at the wall stand control panel. The corresponding function cannot be executed.	Try to have the sticking button operate again by pressing it several times. Press the "test" key at the control handle to have message disappear. Call service, if the button continuously refuses to operate correctly.
WARNING: Collision danger - 2nd tube not in safe zone	The safe zone supervision is disabled and the table movements are unlocked. The user guidance "Safe zone unknown" has been confirmed.	Restart the system to get the position of the ceiling suspension. If the error remains, call service.
X-ray source longitudinal movements is not referenced. Please move once into reference lock position.	Servo-supported longitudinal movements in the defined range are only possible after the ceiling suspension longitudinal drive has been self-calibrating against a reference position.	Manually move the X-ray source longitudinal movement into the reference lock position once after startup. Then confirm the message.

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Message	Possible causes	What can be done
X-ray source not exactly rotated into vertical or horizontal position	You cannot release exposures because the X-ray source is tilted into a position close to but not exactly vertical or horizontal.	Tilt the X-ray source exactly into the horizontal or vertical detent.
X-ray tube is too hot!	The X-ray tube is too hot for further operation.	For continuous tube protection, let tube cool down as needed.

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List of Symbols

This section explains general symbols that may be used on the system. For explanations of further symbols, see the sections: System description, Operations, and Accessories.

Symbol	Description
	Manufacturer
	Date of manufacture
	Catalog number
	Serial number
	Batch code
 UDI:	Unique device identifier (example)
	The medical device conforms with European Council Directive 93/42/EEC.
	The medical device conforms with European Council Directive 93/42/EEC.
	Medical device
	Prescription device

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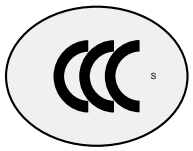
Symbol	Description
	CSA (CSA International) certification
	UL certification
	MET product certification
	China Compulsory Certification
	China Quality Certification
	Bureau of Indian Standards (BIS) certification
	Eurasian Conformity
	Chinese Environmentally Friendly Use Period symbol.
	See the Instructions for Use
	Consult the electronic Instructions for Use
	Follow the Instructions for Use

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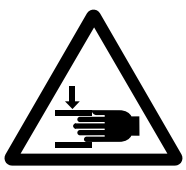
Symbol	Description
	Indicates the entity importing the medical device into the locale
	Do not throw away. Dispose of in accordance with local, state, or federal laws.
	Need for separate collection for electrical and electronic equipment in compliance with the Waste Electrical and Electronic Equipment (WEEE) Directive. When accompanied by “Pb” or “Hg”, components of the device may contain lead or mercury, which must be recycled or disposed of in accordance with local, state, or federal laws.
	Do not sit on a surface.
	Do not push against an object.
	Do not step onto a surface.
	Do not enter a designated area with active implanted cardiac devices.
	Caution
	Risk of laser radiation
	Risk of trapping fingers.

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Symbol	Description
	Magnetic field
	Ionizing radiation
	Fragile; handle with care
	Indicator for radiography
	Indicator for fluoroscopy
	Body weight
	Applied part Typ B
	Item is for single use only and must not be used more than once.
	Equipotential ground
	Do not tilt the detector
	

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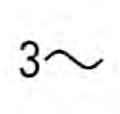
Symbol	Description
	Indicate generally elevated, potentially hazardous, levels of non-ionizing radiation. Or to indicate equipment or systems, for example, in the medical electrical area that include RF transmitters or that intentionally apply RF electromagnetic energy for diagnosis or treatment.
	Three-phase alternating current

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Glossary

AEC	Automatic Exposure Control
APR	**A**natomic **P**rogrammed **R**adiography; you can select the exposure type with the APR buttons. The exposure parameters are then set automatically.
Bottom position	See Center position
Button	A soft key shown on the screen that can be activated by clicking with the mouse.
Click on this	“Pressing” a soft key or activating an element on screen by pressing the mouse button.
DAP	Dose Area Product
Detector	This consists of a photoconductor which registers the incident X-radiation.
DICOM	**D**igital **I**maging and **Co**mmunication in **M**edicine. Medical technology standard for data formatting and transfer.
DR	**D**irect **R**adiography
EI_s	Exposure index
EPX	**E**xamination, **P**atient type, and **X**-ray operator related configuration data to control the system behavior
Exposure parameters	The X-ray exposure is determined by the three exposure parameters: Tube voltage (kV), Tube current (mA) and Exposure time (ms).
Focal spot	The point of the anode on which the electrons are focused.
GCF	Grid-controlled pulsed fluoroscopy
Images	• The unprocessed image (raw image) is produced by the detector and has full resolution. It is temporarily stored on the hard disk and is used for further preprocessing. It is only subject to a number of detector-specific corrections. • The control image is an image with reduced resolution. It is only used for control purposes during acquisition. This image is automatically deleted when the post image appears on the monitor. • The preprocessed image (pre image) is the result of a number of detector-specific corrections. It serves as the base for all further postprocessings. • The resulting image—the final or postprocessed image (post image)—is the image, which can be transmitted via DICOM or printed out. It encompasses all processing steps in terms of the specific anatomy and type of display. This includes: – Shutter – Region of interest – UNIQUE2-Processing (see section “UNIQUE2 Image Processing” in this glossary) – P-Value-Transformation according DICOM-Display-Standard (optional)
kV-mA-s technique	Three-button setting of exposure data: Tube voltage (kV), tube current (mA) and exposure time (ms) have to be set for the X-ray exposure.

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kV-mAs technique	Automatic two-button technique: Tube voltage (kV) and current-time product (mAs) have to be set for the X-ray exposure.
kV technique	Automatic single-button technique: Only tube voltage (kV) has to be set for the X-ray exposure. The other exposure data are determined by the automatic exposure control (Amplimat).
PACS	Picture Archiving and Communication System.
Patient data	All data belonging to a patient.
Print mode	Print mode determines the combination of layout and scale, e.g. 1 in 1 (one image on one film) or 2 in 1 (two images on one film) etc. In conjunction with the information in the window “HCU scale” print mode decides how the layout and scale are to be printed. The appropriate film size and the appropriate format (portrait, landscape) are selected automatically according to the following rules: 1. The scale is to stay the same. 2. As little film as possible is to be used. 3. The fewest possible black areas are to be generated. 4. Unused film areas are possible but should be avoided. 5. No information should be “cut off” from the image, even if this results in more film being used (black areas, unused film areas); in this case there is automatic switchover to a smaller scale. 6. If both portrait and landscape are available for selection, portrait is used automatically as this fits in the light box better. The user thus has no opportunity of selecting a specific film orientation or a specific film size; this is done by the system. The fifth rule means that if collimation is increased by a few millimeters, there is automatic switchover to a much larger film size, something that results in far more film being used. To avoid this, the fifth rule is overridden by the selection of “fixed scale”. This means that the scale is always set as defined in the field “HCU scale”. However, the edges of the image will be cut off in this case!
QA mode	**Q**uality **A**ssurance mode. Mode of operation which allows to perform detector calibration and constancy tests. During this mode clinical patients are hidden, and predefined QA patients are shown instead.
QA tool	**Q**uality **A**ssurance analysis tool. Allows evaluations (e.g. reject analysis and dose statistic) based on the locally available acquisition data log files. Provides history of test results from QA procedures (see QA mode) for Service.

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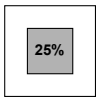
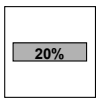
Ranging	The system finds the collimation, analyzes the histogram and determines with the key-percentage value the detector dose of the anatomical region of interest. • **Ranging Mode** Normally (semi mode) only one anatomical region of interest exist (for example, bone). For chest examinations (auto mode) two key-percentage values are used to determine the detector dose of the lung and the mediastinum. • **Key Percentage** Defines where in the whole histogram (100%) the anatomical region of interest is (for example, 25% for bone). • **Measure Field** Inside the mechanical collimation the system defines an area where the histogram will be analyzed out of. Four measure fields are available:  Full field (98/98%)  Half field (98/50%)  Quarter field (25/25%)  Slit field (20/80%)
R/F	Radiography and Fluoroscopy
RIS	**R**adiology **I**nformation **S**ystem; central data input and management terminal for the radiology department.
ROI	Region of interest
SID	Source-image distance
UNIQUE2	**Un**ified **I**mage **Qu**ality **E**nhancement, software for processing digital medical images made with Philips systems. UNIQUE2 = second generation of UNIQUE

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Eleva Workspot for CombiDiagnost R90

Instructions for Use

Version 1.1

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1 Worth Knowing

Publication Details

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Philips Medical Systems DMC GmbH reserves the right to make changes to both these Instructions for Use and to the product they describe. Product specifications are subject to change without notice. Nothing contained within these Instructions for Use is intended as any offer, warranty, promise or contractual condition, and must not be taken as such.

Compliance

CE 0123

This Medical Device meets the provisions of the European Medical Device Regulations.

If you have further questions regarding the applicable national or international standards, please address them to:

Philips Medical Systems DMC GmbH
Quality Department
Röntgenstraße 24
22335 Hamburg
Germany

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About these Instructions for Use

These Instructions for Use are intended to assist users in the safe and effective operation of the product described. Before attempting to operate the product, you must read these Instructions for Use, noting and strictly observing all WARNING and CAUTION notices. Pay special attention to all the information given and procedures described in the “Safety” section.

These Instructions for Use are part of the system. They shall be kept in the immediate vicinity of the system so that they are accessible at any time.

WARNING

A WARNING alerts you to a potential serious outcome, adverse event or safety hazard. Failure to observe a warning may result in death or serious injury to the user or patient.

CAUTION

A CAUTION alerts you to where special care is necessary for the safe and effective use of the product. Failure to observe a caution may result in minor or moderate personal injury or damage to the product or other property, and possibly in a remote risk of more serious injury, and/or cause environmental pollution.

NOTICE

A **NOTICE** is used to identify special advice, for example to assist the operator or to improve an operating sequence.

▷ Condition for operation

► Single step in an action

⇨ Result produced by a step

The following table shows the systems functions/features:

Function/Feature	
Patient list section	included
Examination section	included
Integrated generator control	included
Review section	included
Print	option (for radiography only)
Autoprint with user check	option (for radiography only)
Digital flat detector	included
RIS connection	option
DICOM Export	option
DICOM Media	not available
DICOM Structured Dose Reporting	optional
Touch screen	included
Stitching with dynamic detector	option (only available on table)
Stitching with portable detector	option (only available on wall stand)
Stitching with fixed detector	option (only available on wall stand)
QA tool	option (for radiography only)
Detector sharing	option
Workspot clustering	not available

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Depending on your system configuration, other manuals may be delivered with your system; these contain instructions on safety, calibration, system tests, and Service and maintenance.

For installation, see the system's service documentation.

These Instructions for Use were originally written in English and were created, authorized, and marketed by Philips Medical Systems DMC GmbH.

Different User Types

Some of the functions may only be used if you have received corresponding training. You need to log in as an advanced user (administrator) in order to access these functions. Such functions are marked as: “For the administrator only”.

The following table shows the permissions for each user type:

Normal user	Advanced user (administrator)
	Store manual generator settings
	Configure preset
	Configure annotations
	Configure printer/films
	Configure toolbar
	Add/modify users
	Calibrate printer
Change own password (configurable)	Change all passwords
Quality assurance tab	Quality assurance tab
	QA tool
Calibrate detector (configurable)	Calibrate detector
	Access field service and service tools
RIS query	RIS query
Administration tab	Administration tab
All worklists	All worklists
	Enable/disable and configure the reject reason
	Date time settings
	Import licenses
	Change language
Connect portable detector for detector sharing	Connect portable detector for detector sharing

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An emergency user can perform examinations, but does not have access to the RIS or other patient data (only access to other emergency patients).

The normal user can perform routine examinations.

The advanced user can perform routine examinations and change the system configurations.

Intended Use

As a part of radiography and fluoroscopy systems, the Image Chain is intended to acquire, process, store, display, and export digital X-ray images. The Image Chain is suitable for all routine radiography and fluoroscopy exams, including specialist areas like angiography or pediatric work, excluding mammography.

Indications for Use

For further information, refer to the system's Instructions for Use.

Prohibited Use

The Philips Eleva Workspot is not suitable for processing and displaying digital images produced on other manufacturers' systems or compressed using non-system software. Diagnosis is only possible on suitable PACS monitors.
United States only: The Eleva Workspot is not intended for mammography.

NOTICE

The Eleva Workspot is not an archive and can save images only for a limited period of time.

You should always export images to PACS as soon as possible.

Compatibility

NOTICE

You may only combine the equipment with additional equipment, components, assemblies distributed and tested by Philips. This also applies to replacement parts.

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CAUTION

Risk of image artifacts because grid with wrong SID has been used

Do not use the product in combination with other products or components unless such other products or components are expressly recognized as compatible by Philips.

Changes and/or additions to the product should only be carried out by Philips or by third parties expressly authorized by Philips to do so. Such changes and/or additions must comply with all applicable laws and regulations that have the force of law within the jurisdiction(s) concerned, and with best engineering practice.

WARNING

Changes and/or additions to the product that are carried out by persons without the appropriate training, and/or using unapproved spare parts, may lead to the Philips warranty being voided. As with all complex technical products, maintenance by persons not appropriately qualified and/or using unapproved spare parts carries serious risks of damage to the product and of personal injury.

Prescription Device Statement

CAUTION

Federal law restricts this medical equipment to sale by or on the order of a physician. (United States only)

Training

CAUTION

Users of this product must have received adequate training on its safe and effective use before attempting to operate the product described in these Instructions for Use. Training requirements for this type of device will vary from country to country. Users must make sure they receive adequate training in accordance with local laws or regulations. If you require further information about training in the use of this product, please contact your local Philips representative or

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WARNING

Risk of misdiagnosis

The incorrect use of image processing functions can give rise to false information in the image. Image information of relevance to diagnosis may be suppressed or misrepresented. You must have expert knowledge of digital image processing to change processing protocol settings.

Conformity

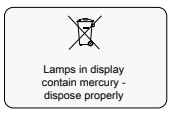
Dangerous Substances

This product may contain substances of very high concern (SVHCs).

According to EU requirements (REACH) Philips provides detailed information at www.philips.com/about/sustainability/reach

This information will be regularly updated.

Mercury (USA Only)



This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or federal laws. (Within this system, the backlight lamps in the monitor display contain mercury.)

Perchlorate

The product meets the provisions and statutes effective in California. It contains perchlorate.

For further information please visit
www.dtsc.ca.gov/hazardouswaste/perchlorate

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2 Safety and Requirements

Warnings and Cautions

WARNING

Maintenance and faults
Do not use the product for any application until you are sure that the user routine-checks have been satisfactorily completed, and that the periodic maintenance of the product is up to date. If any part of the product is known (or suspected) to be defective or wrongly adjusted, do not use the product until a repair has been made. Operation of the product with defective or wrongly adjusted components could expose the user or the patient to radiation or other safety hazards. This could lead to fatal or other serious personal injury, clinical misdiagnosis or clinical mistreatment.

Safety awareness
Do not use the product for any application until you have read, understood and know all the safety information, safety procedures and emergency procedures contained in this Safety section. Operation of the product without a proper awareness of how to use it safely could lead to fatal or other serious personal injury. It could also lead to clinical misdiagnosis or clinical mistreatment.
Never attempt to remove, modify, override or obstruct any part of the product. Product changes by unauthorized personnel could lead to fatal or other serious personal injury.

Adequate training
Do not use the product for any application until you have received adequate and proper training in its safe and effective operation. If you are unsure of your ability to operate this product safely and effectively do not use it. Operation of this product without proper and adequate training could lead to fatal or other serious personal injury. It could also lead to clinical misdiagnosis or clinical mistreatment.
Do not operate the product with patients unless you have an adequate understanding of its capabilities and functions. Using this product without such an understanding may compromise its effectiveness and/or reduce the safety of the patient, you and others.

Safety devices
Never attempt to remove, modify, override or obstruct any safety device on the product. Interfering with safety devices could lead to fatal or other serious personal injury.

Intended use and compatibility
Do not use the product for any purposes other than those for which it is intended. Do not use the product with any product other than that which Philips recognizes as compatible. Operation of the product for unintended purposes, or with an incompatible product, could lead to fatal or other serious injury. It could also lead to clinical misdiagnosis or clinical mis-

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treatment.
You may only use this medical equipment in compliance with the safety instructions in these Instructions for Use and not for purposes other than those for which it is intended.

The user is always responsible for conforming to the regulations that apply to the setup and operation of medical equipment.

NOTICE

No part of the system shall be serviced or maintained while in use with a patient.

WARNING

- **Philips only accepts responsibility for the safety features of its products if maintenance, repairs, and modifications are performed by Philips or persons explicitly authorized to do so by Philips.**
- **As with any technical appliance, this medical equipment also calls for proper operation and regular competent maintenance and care, which are described in the section "Maintenance, Cleaning and Disposal."**
- **In the event of incorrect operation or maintenance of medical equipment, Philips cannot be held liable for any resulting faults, damage, or injuries.**
- **Even if no error message appears, but the medical equipment does not function as usual (first signs of a defect), customer service must be informed.**
- **Safety circuits may not be removed or modified in any way.**
- **You must not use this medical equipment if it has any electrical or mechanical defects. This applies, particularly, to faults in indicators, displays, warnings, and alarms.**

WARNING

Only especially trained and authorized technicians are allowed to service the Bucky unit.

CAUTION

Do not exceed the ambient conditions.

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NOTICE

Any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.
“Serious incident” means any incident that directly or indirectly led, might have led or might lead to any of the following:

- The death of a patient, user or other person
- The temporary or permanent serious deterioration of a patient's, user's or other person's state of health
- A serious public health threat

Electrical Safety

According to IEC 60601-1 this medical equipment is classified as Class I ME equipment and applied parts are classified as Type B applied parts.

Type B applied parts are not suitable for direct cardiac application.

The system is designed to run continuously at normal use.

WARNING

Do not remove covers or cables from this product unless expressly instructed to do so in these Instructions for Use.

CAUTION

Do not operate the system adjacent to or stacked with other equipment.

If you connect parts of a system to a power strip, contact Philips service first. Connect only parts of the same system to one power strip. Safeguard unused sockets of the power strip.

This medical equipment may only be operated in medical rooms which meet IEC requirements.

Protection Against Entering of Liquids

This medical equipment meets class IPX0 according to IEC 60529 (no special protection). According to IEC 60601-1 sub-clause 7.2.9, no label and no note is required.

WARNING

The medical equipment is not protected against entering of liquids. Do not allow liquids to enter the medical equipment described.

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The bar code scanner meets class IP41 according to IEC 60529 (resistant against dripping water).

Protection Against Entering of Liquids - Wireless portable detector

The large wireless portable detector meets Class IP41 according to IEC 60529 (resistant against dripping water).
The small wireless portable detector meets Class IP43 according to IEC 60529 (resistant against spraying water).

NOTICE

Fluids may get under the rim, but not inside the wireless portable detector. To protect the wireless portable detector from contamination with dirt or germs you may use protective bags.

Uninterruptable Power Supply (UPS)

The optional uninterruptable power supply (UPS) protects the Eleva Workspot from power outages.

CAUTION

After System Off, Emergency Off, Room Off, or Power down: If the UPS is installed, the Eleva Workspot will be under power even when the power is turned off.

Applied Parts According to IEC 60601-1

Component	Applied part
Patient table	- Table top - Compressor - Detector front cover
Wireless portable detector	Front cover
Wall stand (VS)	Cover
Ceiling Suspension CSM	-
Stitching support	Tread surface
Accessories	- Hand grips - Footrest

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Patient Environment

The Eleva Workspot may not be installed in the patient environment. There must be a distance of at least 1.5 m to the patient (IEC 60601-1-1).

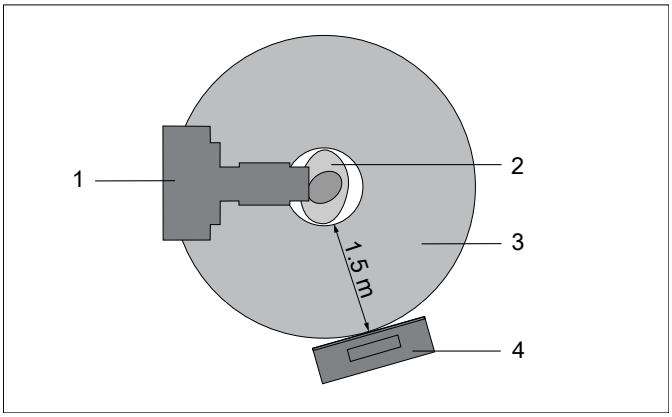

Fig. 1: Standing patient

No.	Description
1	X-ray system (wall stand with ceiling suspension)
2	Patient
3	Patient environment
4	Eleva Workspot

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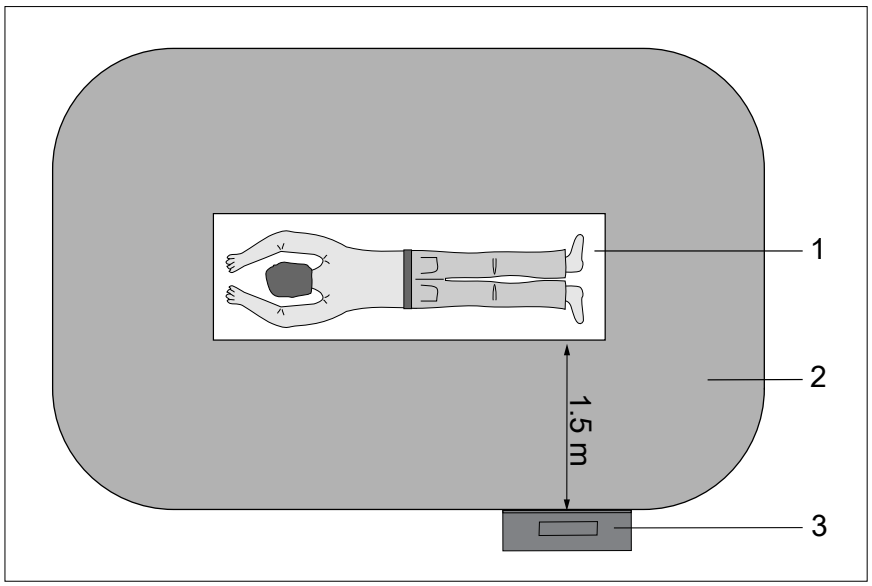

Fig. 2: Lying patient

No.	Description
1	Table top
2	Patient environment
3	Eleva Workspot

Mechanical Safety

WARNING

- **Be sure to keep all body parts or clothing free of the equipment to avoid getting caught or trapped within the moving components of this medical equipment.**
- **Remove all objects from the medical equipment's radius of movement.**
- **Make sure that ceiling-mounted components you are not using (monitor suspension, X-ray tube) are positioned in such a way that neither staff nor patients can be injured by them.**
- **You may not transport this medical equipment while it is in operation. Shut down the medical equipment before transportation and ensure that all peripheral parts of the system (monitor, mouse, keyboard, cables, etc.) are disconnected and transported safely.**

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WARNING

Make sure that audible and visual communication between the operator and patient are established throughout the entire examination. If necessary, communication must be maintained through technical means, for instance, an intercom.

WARNING

Do not remove covers or cables from this medical equipment unless expressly instructed to do so in these Instructions for Use. Moving parts are present within this product. Removing covers could lead to serious or fatal personal injury.

Covers should only be removed by qualified and authorized service personnel. In this context, qualified means those legally permitted to work on this type of medical electrical product in the jurisdiction(s) in which the product is being used, and authorized means those authorized by the user of the product.

Only non-allergenic materials are used.

Explosion Safety

WARNING

Do not use this product in the presence of explosive gases or vapors. Do not use this product in the presence of an oxygen-rich environment or an inflammable anesthetic mixture with air, oxygen or nitrous oxide. Using this product in an environment for which it was not designed can lead to fire or explosion.
This medical equipment is not AP or APG equipment (anaesthetic-proof or anaesthetic-proof category G [gas]).

WARNING

Detergents and disinfectants, including those used on patients, may create explosive mixtures of gases. Please observe the relevant regulations.

WARNING

Do not use flammable or potentially explosive disinfecting sprays. Such sprays create vapors, which can ignite, causing fatal or other serious personal injury.

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Fire Safety

WARNING

- **You must never operate this medical equipment in areas where there is a risk of fire.**
- **If it is safe to do so, isolate the product from electrical and other supplies before attempting to fight a fire. This will reduce the risk of electric shocks.**

WARNING

Ventilation apertures must not be covered while the equipment is switched on.

WARNING

On electrical or chemical fires use only extinguishers which are specifically labelled for those purposes. Using water or other liquids on an electrical fire can lead to fatal or other serious personal injury.

WARNING

This medical equipment is not AP or APG equipment (anaesthetic-proof or anaesthetic-proof category G [gas]).

Diagnostic Safety

Loss of Data Due to Power Outage

This medical device must be connected to an uninterruptible power supply to prevent database damage and image loss in the event of a power outage. The uninterruptible power supply is part of the medical device.

Check the uninterruptible power supply in accordance with the instructions of the supplier.

Data Inconsistency

Do not switch off the operator’s console at the power switch. This can lead to database errors or data inconsistencies. Always follow the sequence for switching off as described in chapter “Switching the System On/Off”.

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Use of Lead Markers

To avoid false interpretation of body direction (right, left) and patient orientation, Philips strongly recommends the use of lead markers (letters), as traditionally used in conventional radiography.

NOTICE

Do not use lead markers inside the Bucky unit for the wireless portable detector, place them only outside, for example: on the patient table surface or on the wall stand cover.

Electrostatic Discharge (ESD)

CAUTION

Always use proper static procedures, protection, and products prior to opening and during handling of this product. This product contains components that are electrostatic sensitive. Failure to use ESD procedures may cause damage to these components. Such damage to components is not covered by Philips warranties.

Connections to sensitive parts are identified by the ESD warning symbol as shown.

Electrostatic discharge (ESD) can amount to a significant voltage, which may cause damage to Printed Circuit Boards (PCB) or other systems.

ESD damage is cumulative and may not be apparent at first, as indicated by a hard failure, but can cause degraded performance. Therefore, always use proper ESD handling procedures. ESD can result from low humidity condition or use of electrical equipment on carpeting, linens, and clothing.

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Electromagnetic Compatibility

WARNING

Medical electrical equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the accompanying documents.
In accordance with its purpose, this device fulfills the regulations of the EMC legislation which govern the permissible emission of electromagnetic fields from electrically operated equipment and the immunity to be fulfilled.
Despite this, it cannot be excluded with absolute certainty that radio signals from high-frequency transmitters, such as mobile phones or similar mobile radio equipment, which also satisfy the EMC regulations will not influence the proper functioning of electro medical equipment when these are operated in direct proximity with relatively high transmitting power. The operation of such radio equipment should, therefore, be avoided in close proximity to electronically regulated or controlled medical products in the face of possible functional interference.

Explanation
Electronic equipment which conforms to the EMC regulations is configured in such a way, that under normal circumstances, malfunctions caused by electromagnetic interference can be excluded. However, with regard to radio signals from high-frequency transmitters with a relatively high transmitting power, which are operated in close proximity to electronic devices, the occurrence of possible electromagnetic incompatibility with the electronic device cannot be completely ruled out.

With unusual configurations, this could result in unintentional operating sequences being initiated in the device and, under certain circumstances, undesirable risks for patient or operator.

Therefore, the activation of any transmission from mobile radio equipment – this also applies to equipment in standby mode – is to be avoided.

Mobile phones must be **switched off** in marked problem areas.

For further information see chapter “Technical Data.”

WiFi Connectivity of the Wireless Portable Detector

The detector uses standard WiFi technology for data transfer to the workstation. This technology is proven to be safe in combination with current pacemakers. However it can not be completely excluded that an older pacemaker or other EMC sensitive life-supporting device be influenced by the WiFi emission if operated in close proximity to the detector.

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WARNING

WiFi technology is used by the wireless portable detector for data transfer. Due to the WiFi emission, special care must be taken when using the wireless portable detector close to life-supporting devices. In this respect observe the following rules:

- **The life-supporting device should be certified according to IEC 60601-1-2. This standard defines the minimum distance for a given maximum emission power, corresponding to a maximum instantaneous electrical field of 10 V/m. Customers have to take into account, on their own responsibility, that older life-supporting devices do not necessarily satisfy the IEC 60601-1-2 criteria.**
- **Make sure that you keep the minimum distance to a life-supporting device. Take into consideration that a strict compliance with IEC 60601-1-2 requires the following distances at the given emission power:**

WiFi component	Emission frequency[1]	Maximum WiFi emission power	Minimum distance to life supporting devices
Wireless portable detector	2.4 GHz	17 mW	30 cm (11.8 in)
	5 GHz	13 mW	26 cm (10.2 in)

[1)]The WiFi connection of the internal network can be configured for 2.4 GHz or 5 GHz bands. It is recommended to use the 5 GHz band since this can be expected to show less EMC effects.

WARNING

Special consideration for pacemakers

WiFi technology is proven to be safe in combination with current pacemakers. However it cannot be completely excluded that an older pacemaker or other EMC sensitive life-supporting device be influenced by the WiFi emission if operated in close proximity to the wireless detector.

- **If you suspect that there will be an EMC interaction between the detector and a pacemaker or life-supporting device, switch off the WiFi connection and use the cable connection.**

Error Messages

WARNING

Even if no error message appears, but the equipment does not work as usual (first signs of a defect), call customer service immediately.

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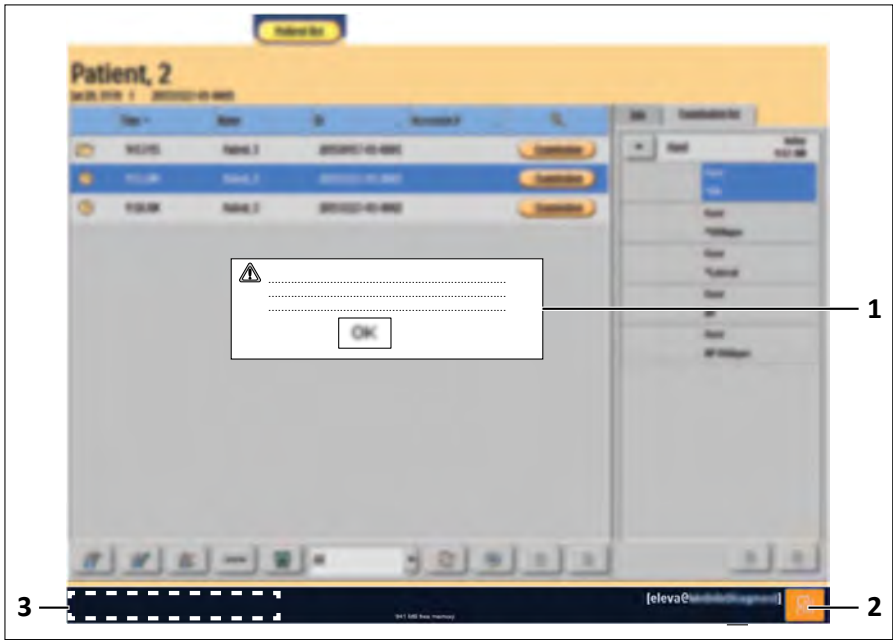
On the Eleva Workspot

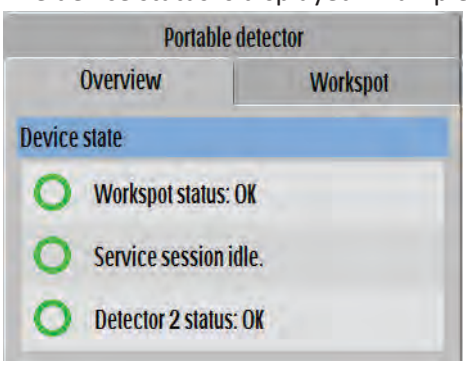
When an error has occurred in the system or a part of it, an error message appears on the operator's console monitor with instructions on how to rectify the error:



Legend	Function	Meaning	What you must do
1		Error message You will find a list of all messages in the Appendix.	
2		System status display Blue: Status OK Orange: Attention needed Red: Unrecoverable error	Click on status display: More information appears.
3		Message of system status	

► Click on the status display.

⇨ The device status is displayed. Example:



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The following symbols may appear:

Symbol	Meaning
	Green circle: Everything OK
	Yellow triangle: Attention needed For example, printer needs attention.
	Red cross: Unrecoverable error

You will find a list of all error messages in the Appendix.

On the RF Viewer

When an error has occurred in the system or a part of it, an error message appears on the RF Viewer with instructions on how to rectify the error:

No.	Meaning	What you must do
1	Error message	You will find a list of all messages with further information in the Appendix. Confirm the message: Click **OK** or press **F7** on the keyboard.
2	Message of system status	

Making Screenshots

When a message appears, you can save a screenshot of the message for customer service.

- ► Press SHIFT+F11.

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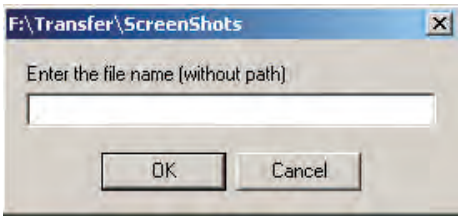
⇨ This window appears:



► Enter a file name and press OK.

⇨ The screenshot is saved on the Eleva Workspot computer and can be accessed by authorized Philips service engineers.

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3 Settings for Product Protection and Privacy Protection

About this Chapter

This chapter reflects the design and intended use of the device regarding privacy and product security. It summarizes the configurable controls and does not apply to uses of the device that are not in accordance with its directions for use.
The security of Philips products needs to be an important part of your security-in-depth strategy. However, protection can only be realized if you implement a comprehensive, multi-layered strategy (including policies, processes, and technologies) to protect information and systems from internal and external threats. Following industry-standard practice, your strategy should address physical security, operational security, procedural security, risk management, security policies, and contingency planning.
The practical implementation of technical security elements varies by site and may employ a number of technologies, configurations, and software solutions. As with any computer-based system, protection can include firewalls, network segmentation, and/or other security devices between the medical system and your institution's network. Such perimeter and network defenses are essential elements in a comprehensive medical device security strategy. Any device connection to an internal or external network should be done with appropriate risk management for product effectiveness and data and systems security.

In the chapter "IT Network Integration Information" you will find technical data for managing the system in your network.

Data Encryption

Encryption on Disk

The system offers data encryption on the local disk of the Eleva Workspot. Per default the data encryption is activated at the system. The data encryption protects all ePHI (electronic protected health information) that are stored on the local disk.

The data on the system are encrypted according to the Advanced Encryption Standard (AES) with the 128-bit AES encryption. This ensures that the data on the local disk are safe and not accessible if the system is off or if the disk was removed, for example, for replacement.

If the data encryption is enabled, the system works as follows:

- On each startup of the system (after shutdown, reboot or aborting), the encrypted disk (or partition) is locked.
- A user login is required in the "decryption login" dialog, to unlock the disk.
- After successful disk-unlock, all data is transparently decrypted/encrypted during read or write access to the disk – until the next reboot.

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- All local users, except Emergency and Demo, have permissions to unlock the disk.

NOTICE

Central user authentication

If central user authentication is enabled, “Normal” users may unlock the disk only after having successfully authenticated once at the unlocked system.

NOTICE

Nobody else, including Philips, has access to the system or encrypted data. Therefore, take appropriate measures to be able to unlock the system at any time, especially in emergency cases. Next to user-dependent decryption passwords, one or more master passwords that are placed in your department could be an appropriate measure to allow system access at any time.

NOTICE

Disabling the disk encryption

- Disk encryption is enabled by default on the system. It is in the discretion and responsibility of the system owner to disable it if required.
- For security and privacy reasons, Philips does not recommend to disable the encryption functionality. If you disable the disk encryption, all data stored on the local disk are unprotected if the disk is lost, stolen or disposed without sanitization. Sensitive data may be exposed to unauthorized people.
- When you have decided to disable data encryption, this can only be reverted through a new system installation by the customer service.
- Use the system only when it is fully encrypted or fully decrypted. To ensure complete functionality of the system, wait until an ongoing decryption is fully completed.
- If the data encryption is disabled, you can use the system in emergency cases without a password after system start or restart.

Recovery Password

It is recommended to generate a recovery password. With the recovery password, you can open the encrypted content on the local disk with another PC, for example, when the Eleva Workspot is corrupted or broken.

Customer service can help you generate the recovery password in the service tool.

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NOTICE

The recovery password is supposed to stay in your control only (not in the control of Philips or customer service).
The displayed password is not stored on the system and is not part of any backup. Therefore, you must store it securely in a safe place.

Encryption on Removable Media

The system offers encryption on removable media, for example, QA Data export.

Per default the encryption on removable media is activated at the system.

You can choose between two settings:

- Encryption of the removable media per use
- All removable media are handled equally

If **Allow user to choose encryption per use** is set to **Yes**, you can enable or disable the encryption per use. If this parameter is set to **No**, the selected “encryption default” setting is always enforced.

Further Configuration Items

The following sections describe further configuration items regarding privacy and product security:

- QA Tool
- Reject Reasons
- System Section:
  - User administration
  - Physician list
  - Auto logout

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4 IT Network Integration Information

About This Chapter

This chapter is intended for the organization that is responsible to integrate the medical device into a clinical IT network and to maintain its operation throughout the system life cycle.

This information should support the organization's risk managers during the required risk management process. The information addresses the safety, effectiveness data security and system security of the networked medical device.

It is strongly recommended to use this system only in consideration of the security and privacy hints in this chapter. Please follow these instructions carefully.

Purpose of the Connection to the IT Network

The purpose of the CombiDiagnost R90 is to acquire, process, store, display, and export digital radiographic and fluoroscopic images. For whole description of the intended use see section “Intended Use”. CombiDiagnost R90 can operate stand-alone. However, it can aid the clinical workflow only when access is granted to services on the clinical IT network. For diagnostic purposes, a network connection of the CombiDiagnost R90 system to a DICOM printer or a viewing workstation is required.

Required Characteristics of the IT Network

The following figure depicts the CombiDiagnost R90 system in a typical hospital configuration.

In a typical room setup, the technical equipment is located in an examination room with physical access control for authorized service personnel only.

The room is reserved for the examination of a patient by a clinical operator.
The console (Eleva Workspot) of the CombiDiagnost R90 system is connected to the clinical IT network. CombiDiagnost R90 can only be ordered with the hardware firewall solution “mShield” for the connection to the IT network.
The IT network allows access to network services such as DICOM printers, the Radiology Information System (RIS), or the department's Picture Archiving Communication System (PACS).

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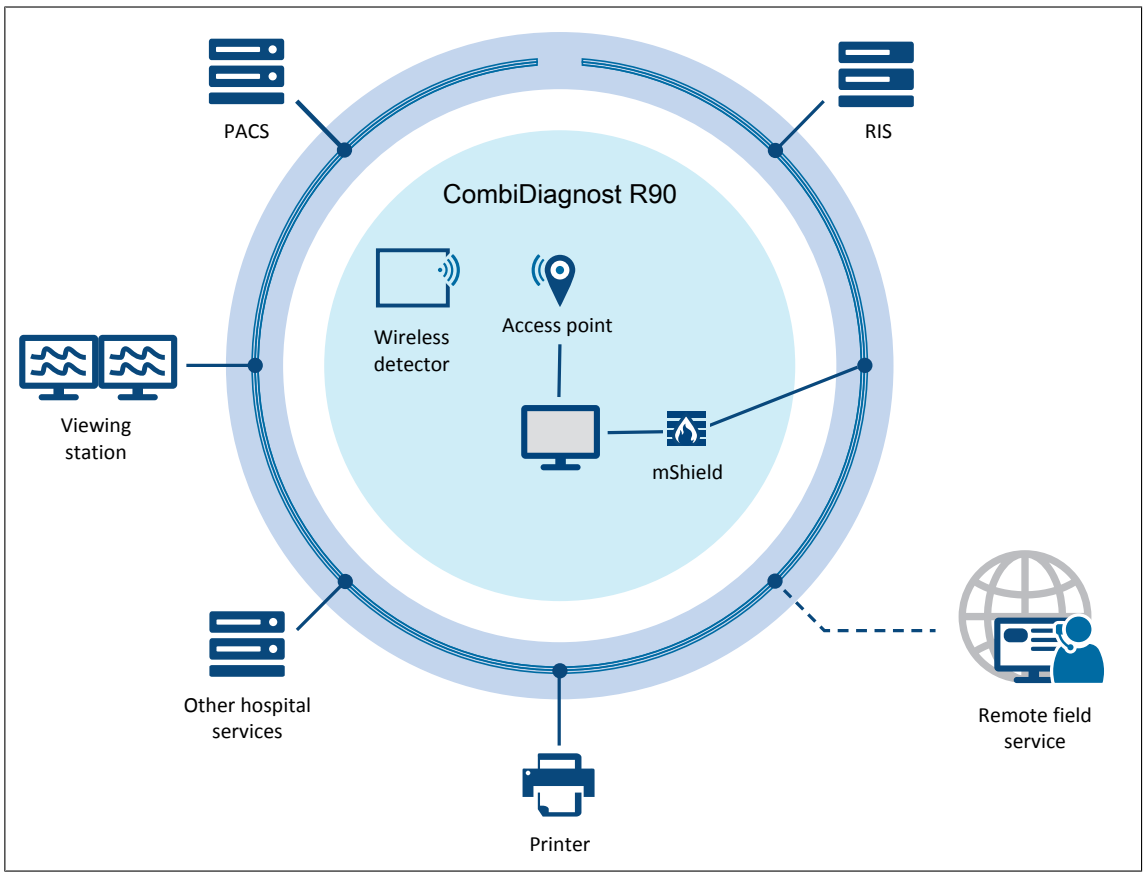

Furthermore, access to viewing stations and other hospital services is possible, for example, a central logging server (IHE ATNA / BSD syslog) or a time synchronization server (NTP).
To acquire static and dynamic image data, the ElevaWorkspot is connected via an internal network. A dynamic flat panel detector and optionally a wireless static flat panel detector are connected to the Eleva Workspot. There is no routing between the internal network and the clinical IT-Network. The ElevaWorkspot provides also DICOM functionality with access to the clinical IT network. For details on the internal network of the wireless detector, see the Wireless Solutions IT Guide, section “Wireless without worries – Philips wireless DR and DRF solutions”. The guide answers the most important questions when introducing wireless detector technology to the hospital infrastructure.

This medical equipment can be accessed remotely by Philips remote service engineers for various purposes, for example, remote application support or manual upload of log files for later analysis. Also, the system can automatically (periodically) upload log files to servers in the Philips remote center. Uploaded log files can be analyzed to help identifying the need for preventive and corrective actions. Various configurations for Philips Remote Service Network (RSN) access exist. Technically, all remote connections are based on a TLS authenticated and encrypted tunnel, initiated by the medical equipment towards the Philips RSN. Optionally the TLS connection may be routed through a dedicated Virtual Private Network (VPN). RSN connectivity and service support are optional[1].

[1] The Philips Remote Services Protecting systems and patient privacy brochure elaborates on the security controls implemented at Philips for remote services on the Philips Remote Service Network (RSN).

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Required Configuration of the IT Network

The following table provides an overview of the ports and protocols. This can be relevant for the proper setup of firewalls and intrusion detection systems.

Socket port	Fixed	Inbound	Out-bound	Protocol(s)	Optional	Usage
UDP:123	yes	yes	yes	NTP	yes	Time synchronization
UDP:514	no	no	yes	Audit Trail according to IHE Basic Security profile (BSD style SysLog)	yes	Centralized audit trails and alerting
UDP:601	no	no	yes	AuditTrail according to IHE ATNA profile	yes	Centralized audit trails and alerting
TCP:3010	no	yes	no	TLS/SSL DICOM	yes	DICOM Storage commit
TCP:443	yes	no	yes	SSL	yes	Philips Remote Service (iSSLink) based on an SSL tunnel. Protocols inside the tunnel are SFTP and VNC.
TCP:445/139	yes	no	yes	SMB	yes	Dose report printing
TCP:49022	yes	yes	no	SFTP	yes	Export of quality assurance data
TCP:53	yes	no	yes	DNS	yes	Domain name resolution
UDP:53	yes	yes	yes	DNS	yes	Domain name resolution
UDP:67	yes	no	yes	DHCP	yes	Dynamic host configuration
UDP:68	yes	yes	no	DHCP	yes	Dynamic host configuration
TCP:88	yes	no	yes	Kerberos	yes	Centralized user authentication for active directory environment

Optionally, DICOM communication can be protected by TLS/SSL. This requires a Public-Key-Infrastructure at your site.

If a firewall is provided in the customer network infrastructure, the required port configuration can be obtained from the Manufacturer Disclosure Statement for Medical Device Security (MDS2: https://www.usa.philips.com/healthcare/about/customer-support/product-security).

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Technical Specification of the Network

The standard industry Fast Ethernet (100 Mbit/s) technology over copper cables, normally operating in full-duplex mode, is required at least. Media and duplex mode are auto-negotiated. Optionally, Gigabit Ethernet (1000Mbit/s) over copper cables may be supported depending on the available hardware. Further requirements[*1]:

Physical	
Number of wall outlets	1
Connector type	minimum UTP
Network cable	minimum CAT 5E
Logical	
IP address sizes	Native IPv4 / IPv6
DHCP support	IPv4: static IP address only; IPv6: static IP address, SLAAC, DHCPv6
Clinical accessible ports and interfaces	
Network interfaces wired	Yes
Network interfaces wireless	Optional (internal network to an optionally available wireless portable detector)
Infrared	Optional (infrared adapter for SkyPlate attachment)
Removable media	Multimedia file export via USB and DVD recorder.
Performance	
Device class	Network end device (client)
Network bandwidth	maximum 1 Gbps
Quality of service	None
IP packet frame size (MTU)	1,500 bytes (no jumbo frames)
Network peak load estimation	40 MB in 1 minute ten times per hour[*2]
Network latency requirements	None (RFC 1323 supported)
Centralized IT management	
Single sign-on (SPNEGO)	Kerberos based central user authentication (with local credentials cache)
Identity lifecycle management (LDAP)	Kerberos based central user authentication (with local credentials cache)
Policy management (LDAP)	Prohibited for device integrity reasons
Audit trails and alerts (Syslog)	Yes (IHE ATNA profile), UDP or TCP
Domain name spaces (DNS/DNSSEC)	IPv4: DNS not supported; IPv6: DNS supported

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Neighborhood discovery (NDP)	Supported (IPv6)
Time synchronization (SNTP/NTP)	SNTP based

*1 Excluded are the characteristics of dedicated and general purpose medial workstations that may be purchased as product options. Consult the user and/or installation instructions for needs exceeding the ones posed here.
*2 10 examinations per hour each with 2 images of 3000^2 pixels and 2 byte pixel depth transferred within 1 minute to the department archive. Be sure to cross-check these performance expectations with your clinical staff as they actually vary during usage.

Intended Information Flow

Typical network communication of the system is as follows:

- DICOM: communication (bi-directional) with systems that can exchange data through the standard DICOM protocols for Store, WLM and MPPS (optional: Structured Dose Report) *
  DICOM: communication with DICOM printers on the network, point-to-point printers connected directly to the workstation all receive large bitmaps only, essentially.*
- Windows default printing is used for dose reports (LPR, JetDirect, Windows Printing)
- Audit Trail: communication with a central log repository (BSD syslog / IHE ATNA)
- Optionally, the Eleva Workspot may be accessed for remote service purposes.*
- Optional communication with NTP (time sync) servers

* This communication includes “Electronic Protected Health Information” (ePHI).

Hazardous Situations

CombiDiagnost R90 can operate stand-alone, but for diagnostic purposes a printout or a viewing workstation is required. If these destinations are not reachable via the IT network, CombiDiagnost R90 uses its local storage for buffering until the examination data is successfully exported to an archive destination.
According to its intended use, the CombiDiagnost R90 system is not an archive. Therefore, any damage to the local storage for buffering may lead to image data loss if a successful export to an archive destination is still open. Unavailability of the IT network would increase the probability of such an incident. If the local storage for buffering becomes full, no more examinations can be conducted.

Finally, unavailability or failure of the IT network can lead to hazardous situations, including the risk of late diagnosis and/or the necessity of an image retake.

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Risk Management for the IT Network

It is the customer's responsibility as the operator or organizer of the IT network to consider that in a clinical environment a failure of the IT network can result in hazardous situations. The organization responsible for the IT network has to realize that the connection of the CombiDiagnost R90 system to an IT network including other equipment could result in previously unidentified risk to patients, system operators or third parties.
The organization responsible should identify, analyze, evaluate and control these risks (Note: The IEC 80001-1 provides guidance for the organization responsible to address these risks). Also later changes to the IT network could introduce new risks that require additional analysis.
These changes to the IT network include:

- Changes in IT network configuration
- Connection of additional items to the IT network
- Disconnection of items from the IT network
- Update or upgrade of equipment to the IT network

Software Updates and Patch Management

Philips systematically analyzes sources of information related to the vulnerability landscape of this medical device. This includes an assessment of the applicability and need for applying security patches, while mitigating circumstances such as intended use and design are taken into account.[2]

Philips may recommend specific customer or service actions or issue service recommendations to update, alter, or even replace the security controls embedded in the product's design. For recommended customer actions and latest information see the product-specific listing of known vulnerabilities[3]. Be sure to monitor it for updates.

Software updates and security patches alter the design of this medical device and thus require proper validation and approval by Philips. After the release, the updates are distributed via the Philips Field Change Order process.

Open source software is in use in the product. On customer request the list will be disclosed.

[2] The Philips Healthcare Product Security Policy Statement summarizes Philips Healthcare position on securing its medical products and describes our processes for providing products with Security Designed In. This statement is available at http://www.philips.com/productsecurity.
[3] A listing of known security vulnerabilities and recommended customer actions specific for this medical device is available at http://www.philips.com/productsecurity.

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Operating Systems and Hardening

The Eleva Workspot runs the main clinical application with its User Interface (UI) and interfaces towards the hospital network services. The operating system used is Microsoft ® Windows 10 (1607 LTSB) and patches up-to-date at the time of the product design release. Despite containing a general-purpose operating system, the system is customized and hardened for a limited-purpose use in a healthcare facility.

The whitelisting software “McAfee Application Control” is installed. It combats viruses and malware by enabling only safe software to run and by blocking all others. It cannot be disabled by the customer and no regular upgrades are needed.

When powered-on, the Eleva Workspot starts the system application tasks, but the UI is not available until an operator is logged on.

Clinical users are locked into the application and do not have direct access to the underlying operating system.
Automatic log off of medical personnel is offered as security control. Manual log off is also supported. A non-password protected screensaver is configurable, since locking the system would interfere with the safe use of the system.

Additionally, each service user is distinguished by a private “smartcard”. The “smartcard” grants individually identified access to the equipment's functionalities for configuration or service. Access is tailored according to the requirements of hospital technicians, third party field service and Philips service engineers.

Security Attributes and Recommendations

Philips recognizes that the security of Philips Healthcare products is an important part of your facility's security in-depth strategy. However, these benefits can be realized only if you implement a comprehensive, multilayered strategy (including policies, processes, and technologies) to protect information and systems from external and internal threats. In accordance with security and industry best practices, address the following for security strategies:

- Physical security; for example, locks, cameras, keycards, sensors, for restricting unauthorized physical access. Keys to access equipment must be stored in a secure location and policies must be put in place by the customer to protect the keys and limit access to administrative personnel only.
- Operational security; for example, access/authorization controls (including emergency access), change management and network segmentation based on data classification.
- Procedural security; for example, unattended workstation locking, no sharing of access credentials, role based access control should be defined for each user, all accounts require passwords, termination checklists, risk management (that is, performing risk assessments and mitigating identified risks).
- Security policies; for example, ensuring that the system service documentation and media, CDs, and DVDs are securely stored; and that systems are in line with your IT security policies.
- Training and awareness.

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- Contingency planning.

The practical implementation of technical security elements varies by site and may employ a number of technologies, including firewalls, anti-virus software, and authentication and authorization technologies.

As with any computer-based system, protection must be provided. This means that firewalls and other security devices are in place between the medical system and any externally accessible systems.

It is strongly recommended to use this system only in consideration of the security and privacy hints in this chapter. Please follow these instructions carefully.

Review the Philips product security policies regarding remote service, patch management, OS upgrade policies, anti-virus software and more in the “Product Security Policy Statement”. Additional information sources are available through this website (or go to the Philips Healthcare homepage and search for “Product Security Policy Statement”).

Product cyber security plans are documented and uploaded to the following site: http://www.philips.com/productsecurity

It is best practice and the customer’s responsibility to implement plans for disaster recovery and backups. Thereby, you can ensure the availability of the system and the data. Put policies in place for the proper handling of personal/sensitive data stored on backups for all record keeping systems. It is best practice that all system hardware be covered by a service contract through the appropriate manufacturer.

Use best practices to protect patient data against loss and invasion and consider the following:

- The system is not intended as a persistent data archive. Consider transferring the patient data to a dedicated DICOM archive or another secure location as soon as possible after the acquisition, at least daily.
- In order to address privacy concerns, consider deleting patient data from the system after they have been archived.
- Consider the fact that the removable media supported by the system (CD or DVD or USB media) are not suitable as long-term storage for patient data.
- For data backups on removable media, consider the following as well:
  - Archive the hardware and software tools needed to access the backed up data.
  - Address the risk of hardware and software tool breakage and obsolescence.
  - Ensure that the storage location is safe for long-term storage and is secured against unauthorized access.
- Create and safely archive a recovery password for emergency access to all encrypted data stored on the system (see chapter “Recovery Password” on page 32).

If despite all security investigations uncontrolled system behaviour is caused, the hazardous situation may be recovered by restoring a previous backup. Uncontrolled system behaviour can, for example, be caused by a virus or external software.

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Malware Infection

As explained in the former sections, the system is not equipped with a virus scanner. Therefore, the system cannot identify individual viruses or other types of malware. In contrast, the system is equipped with an anti-malware solution that blocks any sort of non-authorized software, no matter if that software can be identified as malware or not.

If any adverse system behavior or any other observation indicates a malware infection, the following actions are recommended:

- Take the system out of operation, do not use it on patients, and inform customer service about the observations.
- Disconnect the system from the network.
- Take own action or ask customer service for the following:
  - Re-install the system software from scratch in order to bring the system into a well-known healthy state.
  - Install all latest software patches.
  - Install additional security measures (including commercial options), for example, a hardware firewall (mShield).

About HIPAA Rules

If applicable, your facility's security strategy should include the standards set forth in the "Health Insurance Portability and Accountability Act of 1996" (HIPAA), introduced by the United States Department of Health and Human Services. You should consider the HIPAA Security Rule, Privacy Rule and the HITECH Act requirements in your internal policies and procedures. For more information, please visit https://www.hhs.gov/hipaa/index.html.

About the EU Regulations

If applicable, your facility's security strategy should include the practices set forth in the "General Data Protection Regulation" (Regulation [EU] 2016/679 of the European Parliament and of the Council of 27 April 2016).

The regulation contains information on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.
In addition, your facility should also take into account any additional, more stringent standards put forward by any individual EU country (Germany, France, and so on).
For more information, please visit https://eur-lex.europa.eu.

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Privacy

As a part of its normal operations this product generates internal, electronic diagnostic log files. These log files do not contain any personal data (including patient, physician, and other data). In the course of maintenance, monitoring or repair of this product or of related development and other product-related activities, Philips may access, store or otherwise use those log files.

To support the centralized audit trail and alerting, this product generates system activity information based on IHE ATNA / BSD syslog.

The user can allow a “Look Over The Shoulder/Take Over (LOTS/TO)” session. During this session, all information displayed on the user interface are exposed to remote service. These information can contain personal data (including patient and physician).

Patient data on removable media, for example a DVD, can be de-identified or optionally encrypted based on the configuration. By default this option is in-active. The de-identification method and the set of affected attributes follows DICOM Part 15, Annex E.

Removable media or DVDs containing patient data must be treated as confidential. Furthermore, they must be maintained in a secure environment. Contact customer service for media handling procedures.

The system does not currently provide a way to de-identify patient data prior to printing or network export. If you wish to print or export de-identified patient data to the network, the following options are available:

Examples:

- Make a copy and rename the patient data using unrecognizable values before printing or exporting.
- If your local archive offers any de-identification tools, use them to de-identify patient data after archiving. Afterwards, print or export the data.

Where needed, access to “Electronic Protected Health Information” (ePHI) has to be given for diagnostic purposes. This enables the customer to follow privacy regulations.
This means explicitly:

- Prevent disclosure (for example, via eye contact) to patient data for unauthorized persons.
- Enable encryption for ePHI transmission to other network nodes via the service application.
- Do not disable encryption and cryptographic integrity control for data at rest via the service application.
- Physically destroy all system hard disks after customer service exchange of the hard disk. This is to avoid disclosure of patient data to unauthorized persons.

Removable Media

If the use of removable media together with the system does not fit into your security policy, the use of removable media can be restricted.
This means explicitly:

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- Remove the license “Reject_Analysis”. For this purpose, a new license file without this license must be generated. After the new license file was employed, the use of removable media is restricted.

AuditTrail

It is the responsibility of your facility to provide a network based audit trail solution to record and examine system activity information. This is to check system usage with respect to “Electronic Protected Health Information” (ePHI) access.
This means explicitly:

- Configure the audit trail solution via the service application.
- Configure NTP time synchronization (via the service application) to ensure accuracy of audit trail timestamps.
- If you want to detect any system incidents related to personal data, you need to set this up with the provided network based audit trail solution.
- If you want to receive a notice in case of a security incident, you need to enable the retrieval of identities of data subjects at the provided network based audit trail solution.

Contact customer service if you need assistance with the service application to configure and set up the network based audit trail solution.

Firewall

A properly configured firewall can help to reduce the vulnerability risk via the network. A firewall is designed to block unauthorized network access while permitting authorized communications.
Philips does not recommend system operation without a firewall. Additionally, it is recommended to assign the system to a separated network segment, for example, a separate VLAN for medical devices.
Eleva based systems run a built-in pre-configured software firewall. The systems can be ordered with and without an external (hardware) firewall. The firewall is configured during system installation via Philips service application.
If a firewall is provided in the customer network infrastructure, the required port configuration can be obtained from the Manufacturer Disclosure Statement for Medical Device Security (MDS2: http://www.healthcare.philips.com/main/support/equipment-performance/product-security/mds2-forms.wpd).

User Accounts and Passwords

Avoid unauthorized access to the system via the user interface to prevent unwanted system changes.
This means explicitly:

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- In general, avoid use of shared accounts/passwords for regular system operation. If shared accounts are created (for example, special user accounts for emergency access to the system), protect such user credentials as much as possible by physical means (for example, deposit the user/password combinations in a lockable cabinet).
- Enable all password rules as defined in chapter “The System Section”.
- Change all default passwords after system installation.
- Limit the usage of the advanced user account “eleva” to one person.

Multi-factor authentication is supported for only the following users:

- Philips service engineer (access to the service tools only)
- Philips development engineer (full access)

The following user accounts are preconfigured:

- eleva
- demo
- service
- an account with emergency user function

Additional accounts for users can be added.

The following best practice can assist in multi-factor authentication:

- Control authentication with physical system access control.

Security Baseline

If you are interested in changing security relevant parameters, compare these parameters with the default values.
This means explicitly:

- Compare the currently configured values with default values from the service manual.
- When an infection with a computer virus is suspected, call the customer service.

Encryption and Authentication

- This product supports encryption and mutual authentication for data in transit by means of SSL/TLS based DICOM. It is the customer’s responsibility to maintain a trustable PKI (public key infrastructure) and especially issue a client certificate for use by the Eleva system.
- This product supports encryption and cryptographic integrity control for data at rest, for example, encryption and cryptographic hashing of patient data or images on harddisk.
- The backup data is not encrypted. It is the customer’s responsibility to implement security measures according to a local risk management. Customer-provided secrets are encrypted in backups at all times. This includes, for example:
  - Secret cryptographic keys (for example, private keys/certificates)

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- User account credentials (passwords)
- WiFi credentials
- Proxy credentials

Network Security Scanning

You can use a network security scanning tool to ensure the security of your local network.

To make sure that the operation of the system is not affected, use the scanning tool only in the quality assurance mode.

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5 System Description

Eleva Workspot and RF Viewer

Overview

The operator's console has a touch screen monitor, keyboard, and mouse.

The R/F Viewer is a standard monitor without a touch screen, that switches on/off automatically with the Eleva Workspot.

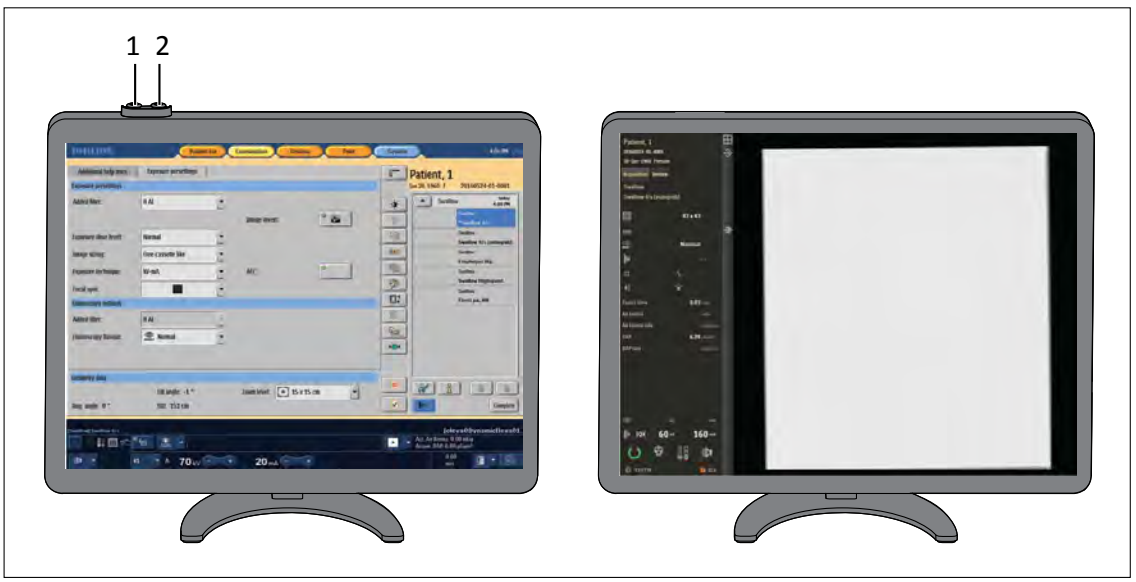

Fig. 3: Eleva Workspot (left) and RF viewer (right)

No.	Function
1	• Switch on the Eleva Workspot and all other components (including the X-ray system geometry) • Restart running the Eleva Workspot by pressing the button for 4 s
2	Switch off the Eleva Workspot and all other components (including the X-ray system geometry)

Operator's Console

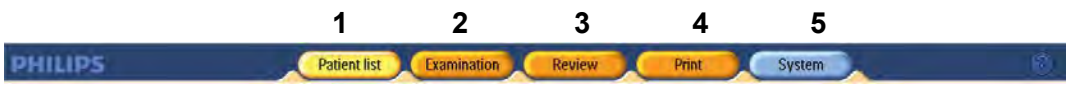

Fig. 4: Sections of the operator's console

You can select the different sections using the main selector buttons (1-5). When a section is selected, the corresponding button turns yellow.

The different sections provide the following functions:

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No.	Function	Meaning
1	**Patient list**	Here you can enter patient data or select patients from a list provided by RIS. You can assign types of examination to the patient or use the examination types from RIS. If a patient has been selected in the Patient list section, this selection is retained when you go into the other sections.
2	**Examination**	Here you can do the following: • Select the examination. • Select the registration device. • Set the generator. • Release X-ray exposures. Here you find the advanced image manipulation tools for: (for radiography images only) • Modifying images • Processing images • Saving to an archive
3	**Review**	Here you will find the following tools: • Advanced image manipulation tools for: (for radiography images only) – Modifying images – Processing images – Saving to an archive • An overview of the patient's images.
4	**Print** (optional)	You will find the printing tools here. You can print one or more images to a film and determine the image size and image field. The print function is available for radiography images only.
5	**System**	You can check the status queue for DICOM Export and Print. You can exit the application program and log out. For the administrator only: Setting administration and customization functions.

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RF Viewer

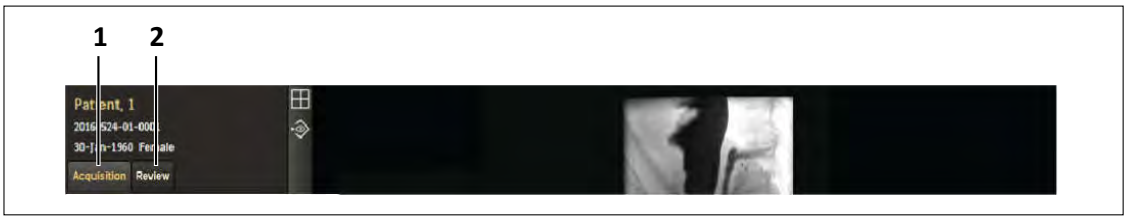

Fig. 5: Sections of the RF viewer

No.	Function	Meaning
1	**Acquisition**	Live fluoroscopy and spot images are displayed. Display of the system settings, for example, geometry position, generator settings, dose.
2	**Review**	Here you will find • Image runs that can be replayed. • Advanced image manipulation tools for modifying images, for processing images, and for saving to an archive. • An overview of the patient's images.

When you are in the Examination or Review section on the Eleva Workspot, the RF Viewer is on and you can switch between Acquisition and Review section.
When you press one of the foot switch pedals, the RF viewer switches automatically to the Acquisition section.

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Workflow

On the Operator's Console	
Eleva Workspot	
RIS query or patient entry	
Select patient	
Select Examination section	
Select alternative view, if necessary	
Select registration device	
Set exposure data and/or fluoroscopy settings (zoom, frame speed)	
On the Geometry	
Position the patient	
Set geometry settings (SID, angulation table, height)	
Collimate	
Radiography	**Fluoroscopy**
Release X-ray with hand switch	Release fluoroscopy or spot exposures with foot switch
On the Operator's Console	
Eleva Workspot for radiography	**RF Viewer for fluoroscopy**
Check image	Check image
Post processing	Post processing
Confirm or reject image	Flag and export desired images
Complete examination on Eleva Workspot	

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6 Switching the System On/Off

Switching On

NOTICE

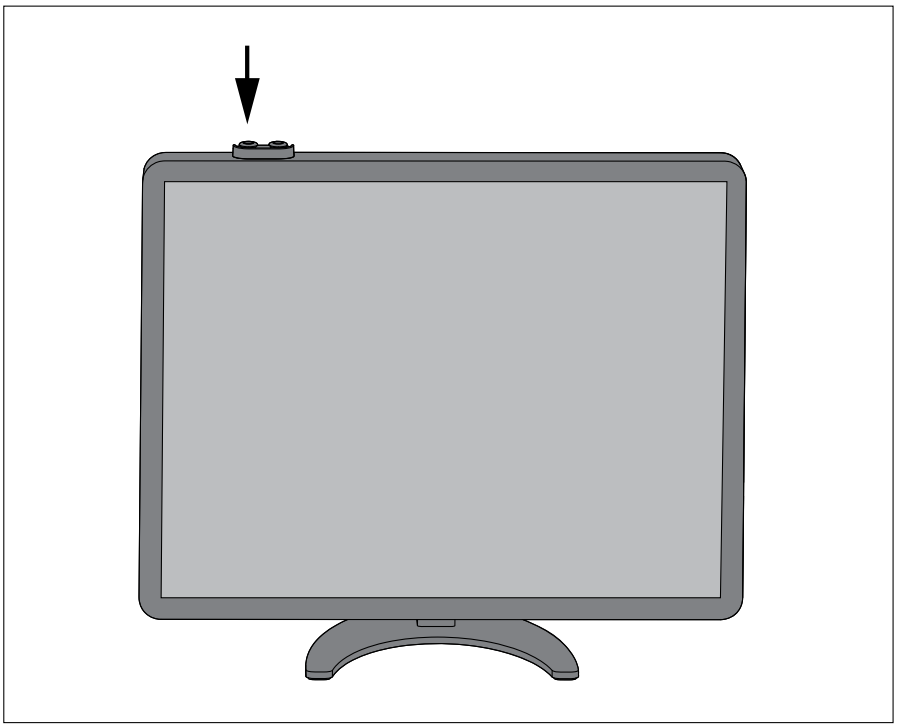
To ensure a proper startup of the system do not touch and do not move any components during the startup. Otherwise, the components may not start up properly and you may have to restart the system.

The startup is finished when the system shows the following:

- The Eleva Workspot displays the patient list.
- The display of the Eleva Tube Head displays the lock screen.

Philips recommends the following sequence:

► Press this monitor button for approx. 1 second.



⇨ The Eleva Workspot and all other components switch on.

► Log on to the decryption screen.

- Enter the user name.
- Enter the password.

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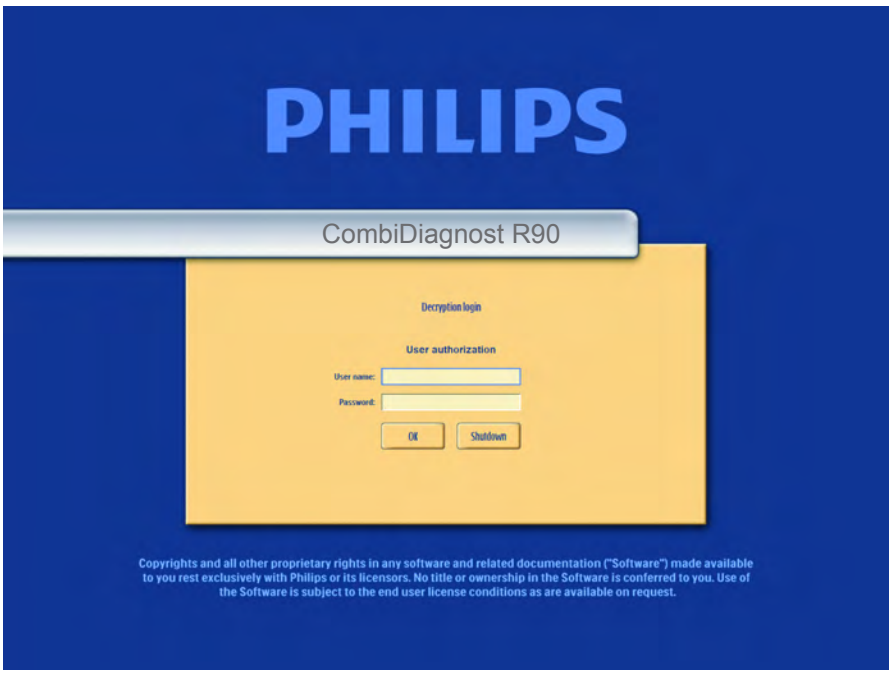
NOTICE

The default user name is **“user”**, the default password is **“user”**. The administrator and customer service can change the user accounts.



NOTICE

For systems without disk decryption

If your system is not decrypted, you will get the login screen instead of the decryption screen. The login screen is described in the following sections.

Logging In

► Log in to the program.

- Enter the user name.
- Enter the password.

NOTICE

The default user name is **“user”**, the default password is **“user”**. The administrator and customer service can change the user accounts.

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Switching Off

CAUTION

Risk of smell from generator

Do not switch on and off several times in quick succession.

NOTICE

The Eleva Workspot is designed for continuous operation. Therefore, it is only necessary to switch off all components in the event of prolonged stoppages.

NOTICE

The Eleva Workspot should be restarted once a day.

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► Press this monitor button to switch off the Eleva Workspot and all other components.

NOTICE

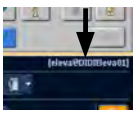
It can take several seconds for the system to shut down.

NOTICE

Do not keep the button pressed. If you keep the button pressed for more than 4 seconds, the system is aborted. This might harm the system.

Quick Logout

You can log out at any time.



► Click there.
The log-on screen appears.

Restarting the System

► Press this for 4 s.

⇨ The Eleva Workspot is restarted. All other components are not effected by the restart.

Aborting the System

▷ The system is not responding and cannot be shut down properly.

► Press this monitor button for approx. 4 s.

⇨ The Eleva Workspot and all other components shut down.

NOTICE

Abort the system only if necessary. It might harm the system.

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Emergency Access to the System

NOTICE

Unless the disk encryption has been specifically disabled, the disk encryption is enabled by default. On systems where the disk encryption is active, the emergency access is available only when the encrypted disk is unlocked.
You need to unlock the disk at each system startup (decryption login). The disk remains unlocked until shutdown and reboot.
Without entering the decryption password, not only access to the encrypted data is restricted, but the system cannot be used in its entirety.
If the system needs to operate in an emergency mode without decryption password, disk encryption needs to be disabled, even though not recommended for security and privacy reasons. When you have decided to disable disk encryption, this can be only reverted through a new system installation by the customer service.

NOTICE

Define an emergency access process in case the emergency's login is not available, because the encrypted disk is locked at system startup and an initial authentication is required to get the system operable.

The emergency mode permits access to the system without a user name and password. When you use the emergency access to the system, the system enforces restrictions to prevent access to all other (non-emergency) patient data.

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In the Emergency mode the following applies:

- Only the “Emergency” worklist is available; it contains only patient data with an emergency status.

  The picture shows a patient with emergency status (symbol in the left column).
- All patients added here are given emergency status.
- You cannot access other patients (for example from RIS).
- RIS query is not possible.

To cancel the emergency status of the patient data:

► Log in as a registered user.

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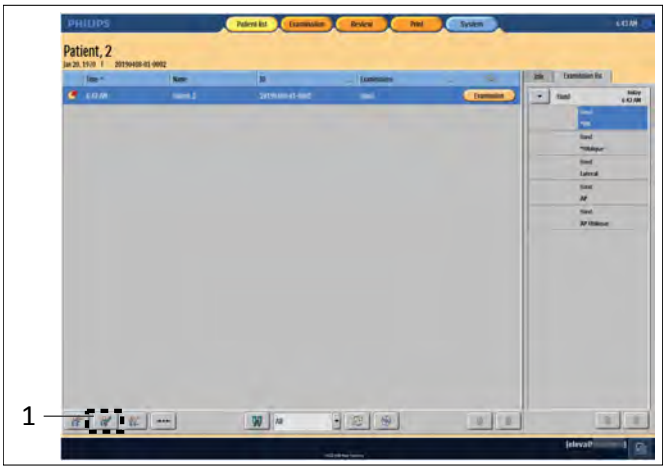
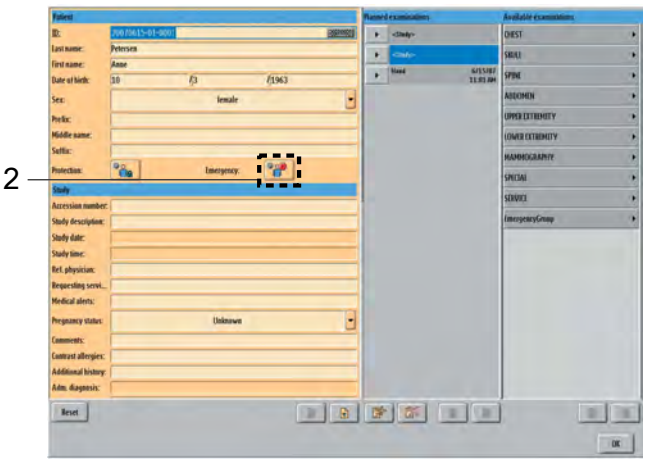
► Display the patient data (1).



► Turn off the emergency status (2).



Switching the UPS Off (Only for Service Reasons)

NOTICE

The UPS is installed by customer service. Under regular operation it shall not be switched off.

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7 Operator's Console

Operator Console Features

You can control the examination data from the scheduling stage through the end of the examination: Enter patient data and examination data, read in, process, print, and save images.

The operator’s console has the following sections:

- Patient list
- Examination
- Review
- Print (optional)
- System.

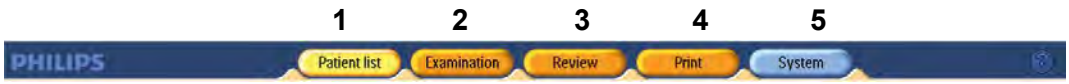

Fig. 6: Sections of the operator’s console

You can select the different sections using the main selector buttons (1-5). When a section is selected, the corresponding button turns yellow.

The different sections provide the following functions:

No.	Function	Meaning
1	**Patient list**	Here you can enter patient data or select patients from a list provided by RIS. You can assign types of examination to the patient or use the examination types from RIS. If a patient has been selected in the Patient list section, this selection is retained when you go into the other sections.
2	**Examination**	Here you can do the following: • Select the examination. • Select the registration device. • Set the generator. • Release X-ray exposures. Here you find the advanced image manipulation tools for: (for radiography images only) • Modifying images • Processing images • Saving to an archive

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No.	Function	Meaning
3	**Review**	Here you will find the following tools: • Advanced image manipulation tools for: (for radiography images only) – Modifying images – Processing images – Saving to an archive • An overview of the patient's images.
4	**Print** (optional)	You will find the printing tools here. You can print one or more images to a film and determine the image size and image field. The print function is available for radiography images only.
5	**System**	You can check the status queue for DICOM Export and Print. You can exit the application program and log out. For the administrator only: Setting administration and customization functions.

How to Use the Operator's Console

Touch Screen

The system is designed for operation via a touch screen. You "press" a button by touching the screen at that point.

Selecting the Section

When you click one of the 5 buttons, the corresponding section appears.

Scrolling Through Lists

Below a list you often find the following two scroll buttons:

By clicking on these buttons you can scroll through lists:

- Upwards (1)
- Downwards (2)

Operating the Slide Controls

You will often find slide controls for setting numerical values. You can change the values by clicking on the + and - buttons:

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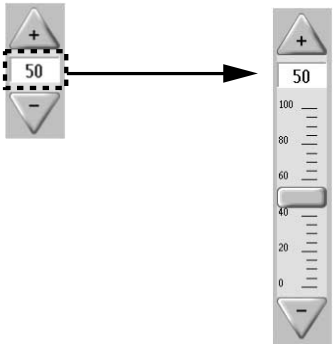
Increase value


Reduce value

To open the slide control: click the white area containing the numerical value. Then you can change the value by moving the slide control.

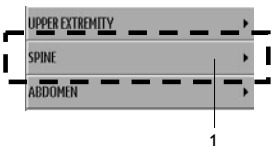
To close the slide control: click the white area again.



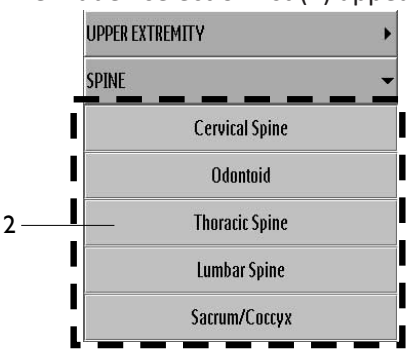
Operating Drop-Down Lists

Some lists drop down for selection. The example shows the list of body regions under patient and examination scheduling.

► Click the button with the small black arrow (1).



⇨ The hidden selection list (2) appears.



Thoracic Spine

► Make a selection from the drop-down list by clicking on it.

⇨ The background of the selected field turns blue.

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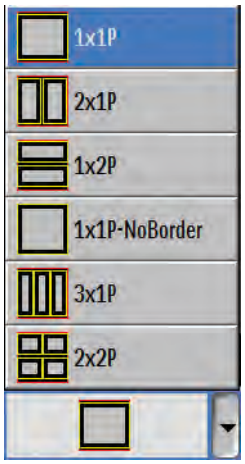
Operating the Selection Fields

Often you can select a certain value from a preset list of values. The example shows the selection field “Template” in the **Print** section. Select the value as follows:

► Click the arrow.

⇨ The drop down list appears and shows the possible values.



► Click the value you want.

⇨ The selected value is displayed.

Operating the Switches

You can change some functions using a switch. The example shows the “Print” switch.

You can tell the status of the switch by the LED on the symbol:

-  LED is green: function is activated.
-  LED is gray: function is deactivated.

Switching a Function On/Off

► Click the switch.

Virtual Keyboard

The system offers a semi-transparent virtual keyboard. With the virtual keyboard you can enter text directly on the screen.

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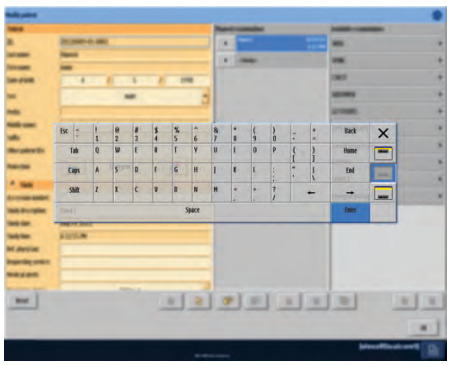
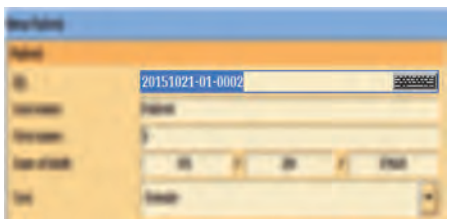
Activating the Virtual Keyboard

Only the administrator can change the settings (in **System/Settings/User interface**):

Setting	Example	Description
Always		The virtual keyboard appears automatically in the following cases: • The cursor is in a text field. • The "Add/edit a patient" button is selected.
On request		When placing the cursor in a text field, a keyboard icon appears on the right-hand side of the text field. Press the icon to display the virtual keyboard.
No	The virtual keyboard is disabled.	Use the physical keyboard.

Displaying and Positioning the Virtual Keyboard

▷ The virtual keyboard is set to **Always** or **On request**.

► Select one of the following settings:

 Hide the keyboard.

 Display the keyboard.

 Move the keyboard to the top.

 Move the keyboard to the center.

 Move the keyboard to the bottom.

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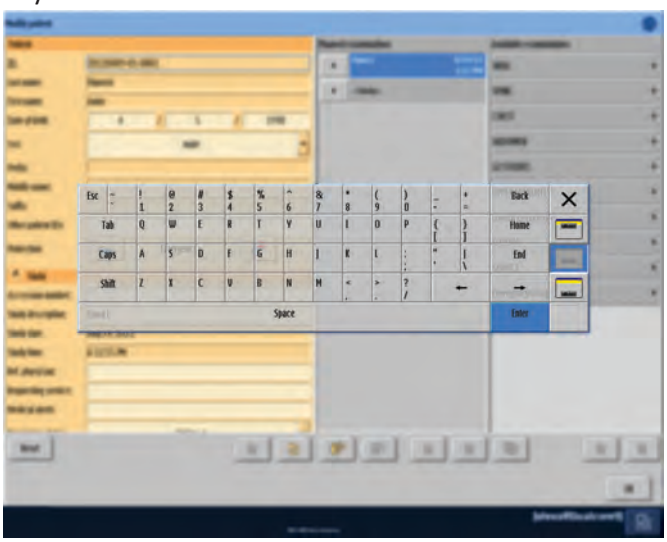
⇨ The virtual keyboard appears according to your selection. The following example shows the keyboard at the center of the screen:



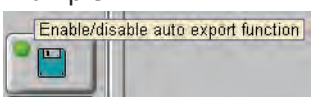
Tool Tips

Tool tips provide help texts for elements of the user interface (for example buttons or selection fields).

► To activate the tool tip mode, click on the tool tip symbol (2) in the upper right corner of the display.

⇨ The background color of the tool tip symbol changes from blue to yellow  and fills up with blue in a rotating motion. This indicates that the system is in tool tip mode.

When you click a button in the tool tip mode, a help text on the function of this button appears. Example:



NOTICE

The tool tip mode is active for about 15 seconds while the symbol background fills with blue. As soon as the tool tip symbol is completely filled with blue, the system returns to the operation mode.

When you click the tool tip symbol again within the 15 seconds, the tool tip closes. The system returns to the operation mode.

When you click another button within the 15 seconds, the clock is reset and the system remains in the tool tip mode.

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8 Patient Administration

Patient List

The Patient list displays the patient data, studies, and examinations stored in the system. You can filter and sort the list by examination status or other patient attributes.
Here you can select a new patient/study, which you can then use in the Examination, Review, and Print sections.
You can add, change, and delete patient data via buttons 5 and 6.

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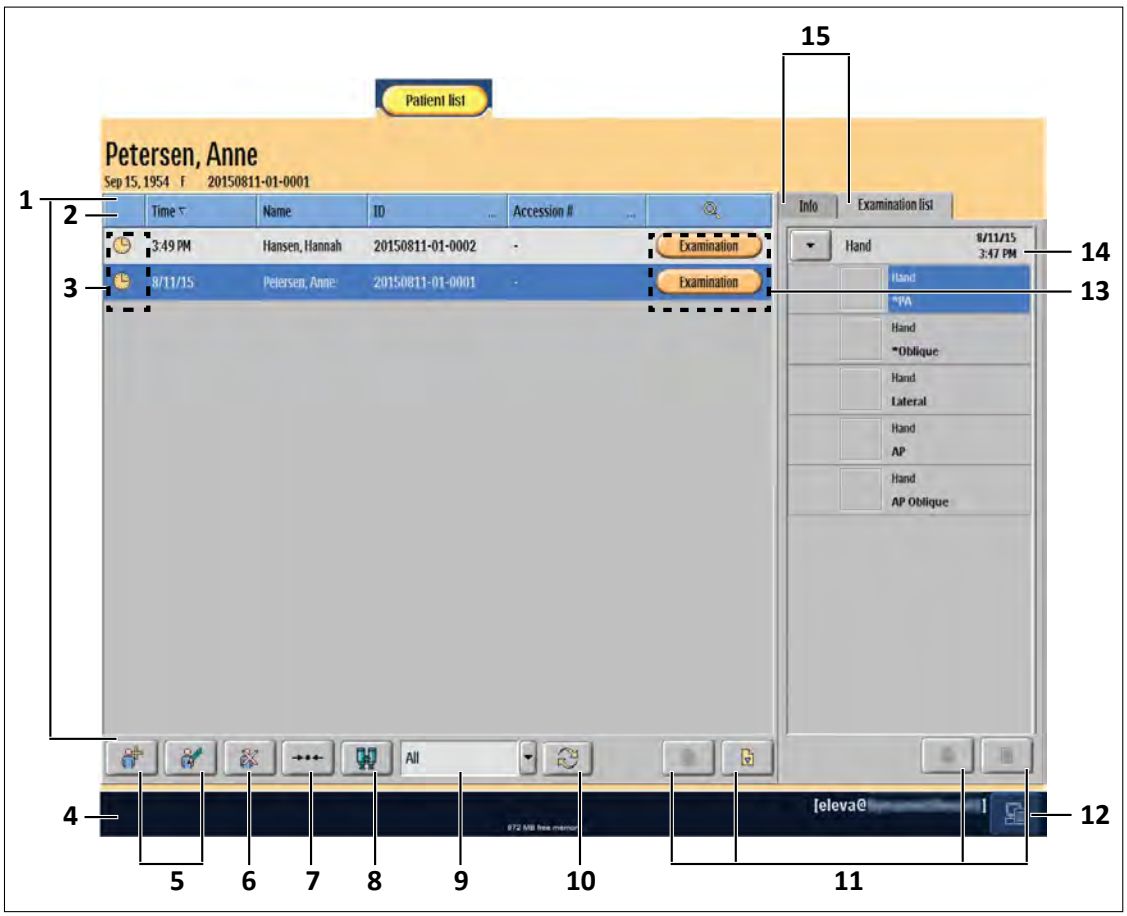

No.	Meaning	
1	Patient list	
2	Flexible columns in the patient list: alternate between Patient ID, date of birth and other functions	
3	Patient status:	
		Patient scheduled
		Patient in progress
		Patient completed
		Patient with emergency status
		Patient with protection status

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No.	Meaning
	! A problem has occurred, for example, export or print failed
	Completing patient
4	Field for system messages
5	Add/edit patient. These buttons open the “Patient and Examination Scheduling” section.
6	Delete patient list entry
7	"Shortcut" button for starting the “free cassette” examination
8	Find patient in RIS and add to the patient list. You can also retrieve images from the PACS.
9	Filter for the patient list, for example, filter for special worklists (in the example all patients are selected): 
10	Updating the worklist with data from RIS
11	Scroll through patient/examination lists (Scroll buttons)
12	System status display (green/orange/red) (see messages)
13	Select a patient and call up the Examination/Review/Print section.
14	Examination folder and data for the selected patient.
15	Switch between examination list and patient information for the selected patient

Customizing the Patient List

You may customize the Patient list to your personal preferences.

Changing the Sequence of the Columns

► Click on top of the column and hold.

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- ► Drag the column in the direction you want.

⇨ The column changes places with the adjacent one.

Changing the Sorting

You can change the sorting in all columns (numerical, alphabetical or by patient status).

- ► Click on top of the column once.

⇨ A small arrow in the top of the column indicates how it is sorted.

Changing the Column Width

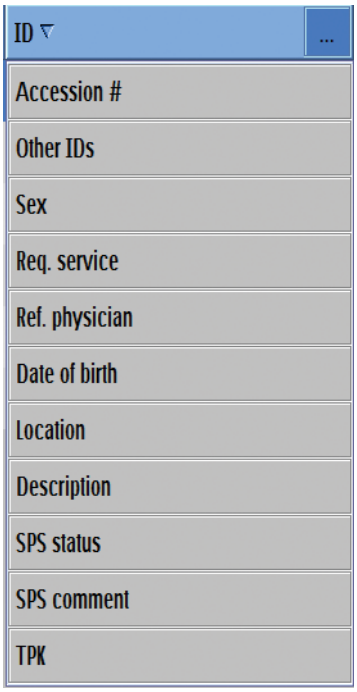
- ► In the top of the column, click the dividing line between two columns, and hold.
- ► Drag the line in the direction you want.

Changing the Column Contents

You can change all columns that show three dots on the right of the top of the column.

- ► Click the dots.

⇨ A submenu appears.



- ► Choose new column contents.

Finding a Patient in the Patient List

If the patient list is very long, you can search for a specific patient.

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► Open the dialog box.

► Enter patient's name or first letters.

⇨ A list of patients matching the search criteria appears:

► Select patient name for examination.

⇨ The background of the patient's name turns blue.

Entering Patient and Examination Data

Entering the Patient Data

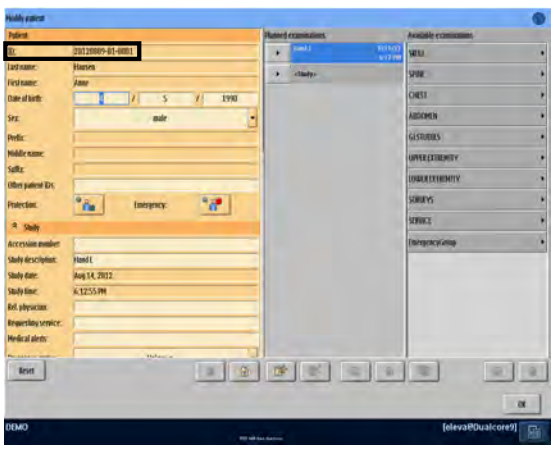
Select the Patient list section:

► Add a patient.

⇨ Patient and Examination Scheduling appears.

⇨ The patient ID (A) is automatically assigned, and can be overwritten.
If you enter a patient ID that already exists, the corresponding data for that patient appear.

A



► Press **Enter**.

⇨ The field **Last name** is active.

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► Enter the patient’s last name.
If you work with a touch screen, the virtual keyboard appears on the screen – if so configured.

► Press **Enter**.

⇨ The field **First name** is active.

► Enter the patient’s first name.
If you work with a touch screen, the virtual keyboard appears on the screen – if so configured.

► Enter further patient and examination data, as required.

► Continue with the next chapter

or

OK ► Confirm patient entry.

NOTICE

As a minimum, Philips recommends entering the following data:

- Patient ID
- Last name
- First name
- Date of birth
- Sex

NOTICE

If the patient's date of birth is unknown, you can enter the patient's current age instead.

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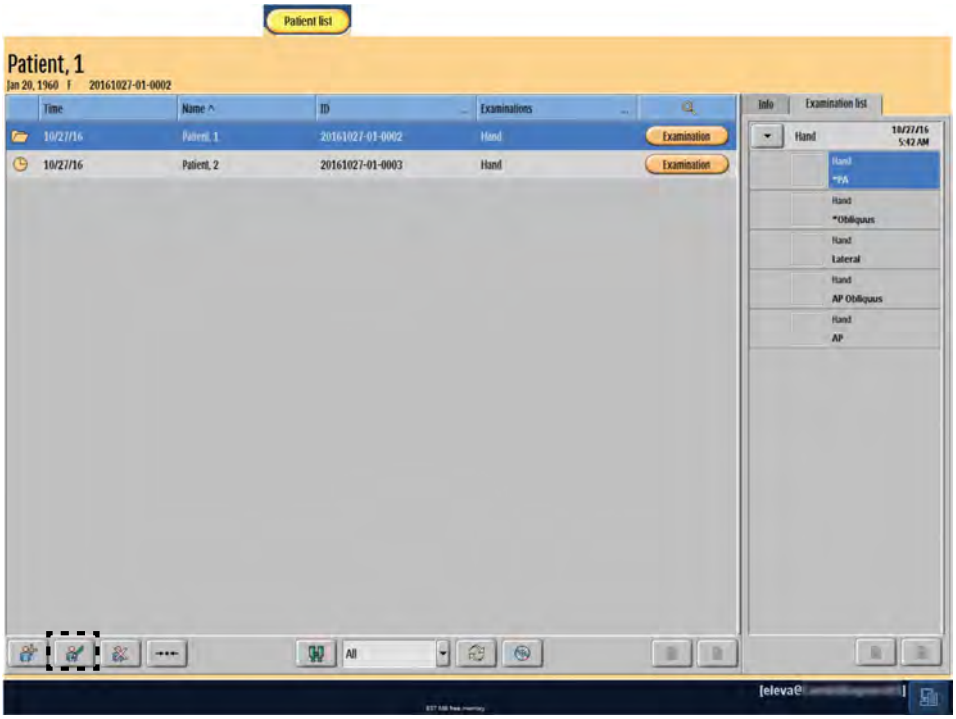
Adding a Study

Select the **Patient list** section:



When you add a new patient, a new study is created automatically. If you want to create further studies for a patient, proceed as follows:

- ► Select the patient.
- ► Select “Edit patient data.”

⇨ The window for the patient and examination scheduling appears.

- ► Add a study.

⇨ In the window for the patient and examination scheduling a new study appears in the column **Planned examinations**. You can now enter examination types here (as described in the next chapter).

⇨ Unless such function is disabled, you can add any examination types to any studies.

Adding the Examination Types

Always add a new study if another type of examination is to have its own accession # (access number).
Under “System/Settings” the administrator can make the automatic creation of a new study mandatory for each new type of examination.

Assuming you are in Patient and Examination Scheduling; new patient data has already been entered:

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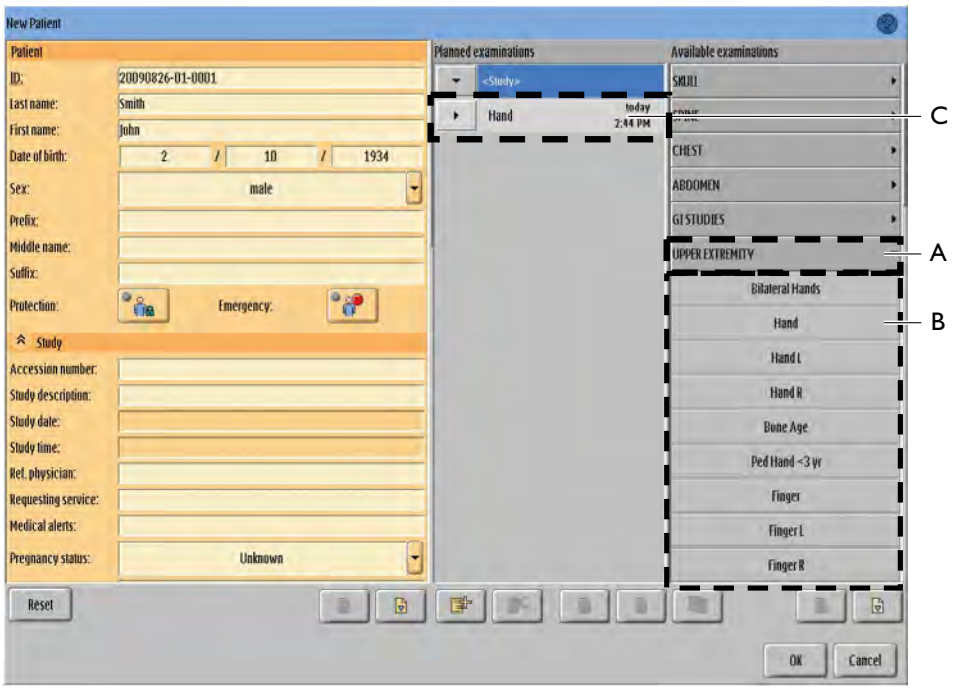

UPPER EXTREMITY ► Select body region (A).

⇨ A list of the possible types of examination appears (B).

Hand ► Select type of examination.

⇨ The type of examination is added to the list of planned examinations (C).

► Continue with the first step if you want to assign more than one type of examination to the patient

or

OK ► Confirm examination type entry.

⇨ The type of examination is scheduled for the patient.

⇨ The Patient list appears.

Protecting the Patient Data and Images

NOTICE

Confirmed examinations and the associated images will be deleted automatically by the system at any time if necessary (for example, no disk space).
Service can install default protections, but there is always a compromise between free capacity and images that have to be protected against deleting.

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In case you want to protect the patient data and images from automatic deletion

► Select the Patient in the patient list.

► Select **Edit Patient Data**.

► Click this.

⇨ When the LED symbol lights up green, the patient data will not be deleted automatically.

Deleting a Study

You can delete a study only if none of the assigned examinations have been started.

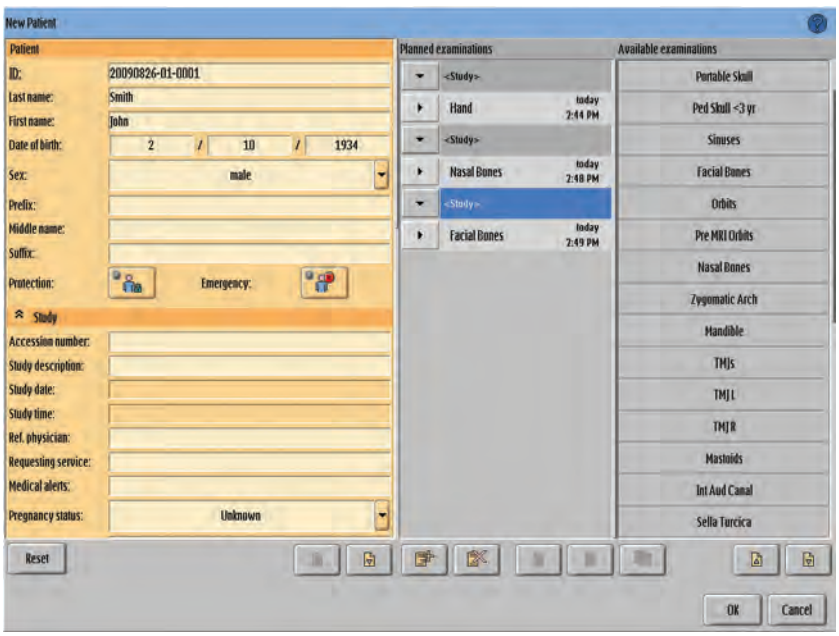
► Select study.

► Delete study.

⇨ In Patient and Examination Scheduling the study is deleted from the column “Planned examinations.”

Deleting Planned Examinations

Assuming you are in Patient and Examination Scheduling:
New patient data has already been entered; examinations have been added.



► Select examination.

⇨ The background of the examination turns blue.

► Delete examination.

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⇨ The examination is deleted from the list of planned examinations.

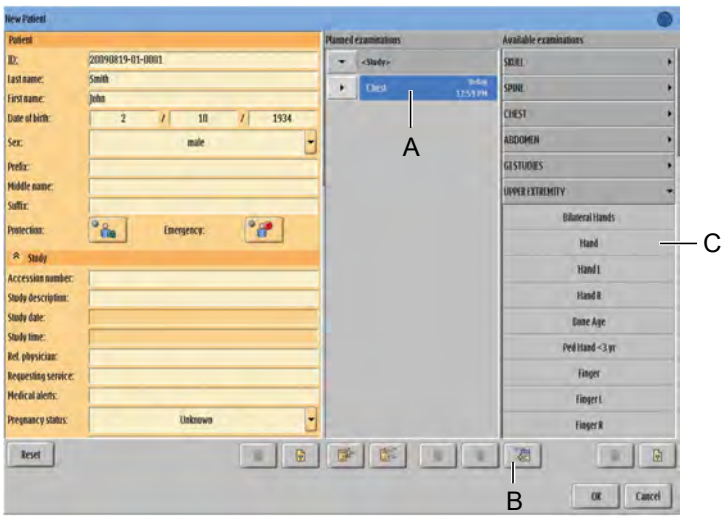
NOTICE

You can delete an examination only if you have not made any exposures for this examination.

Replacing Planned Examinations

NOTICE

You can replace an examination only if it has not yet been started.



- ► Select the examination in the list of planned examinations (A).

- ► Click this (B).
- ► Select type of examination (C).

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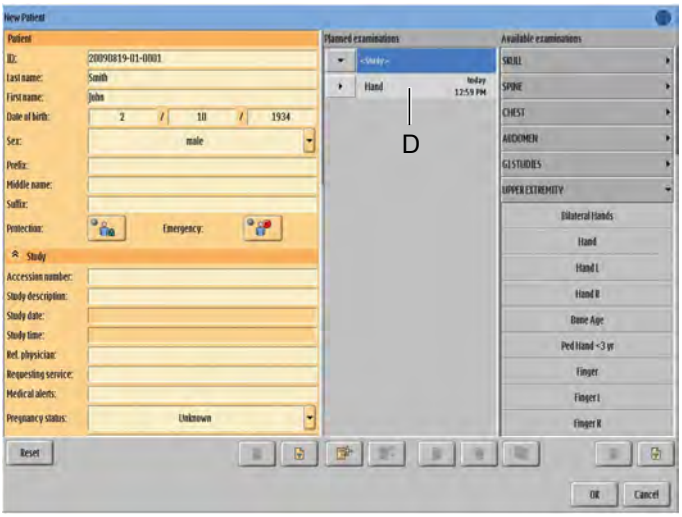
⇨ The type of examination is replaced (D).



Deleting a Patient's Data from the Patient List

NOTICE

Protected patient data may be deleted by the administrator only.

Assuming you are in the **Patient list** section:

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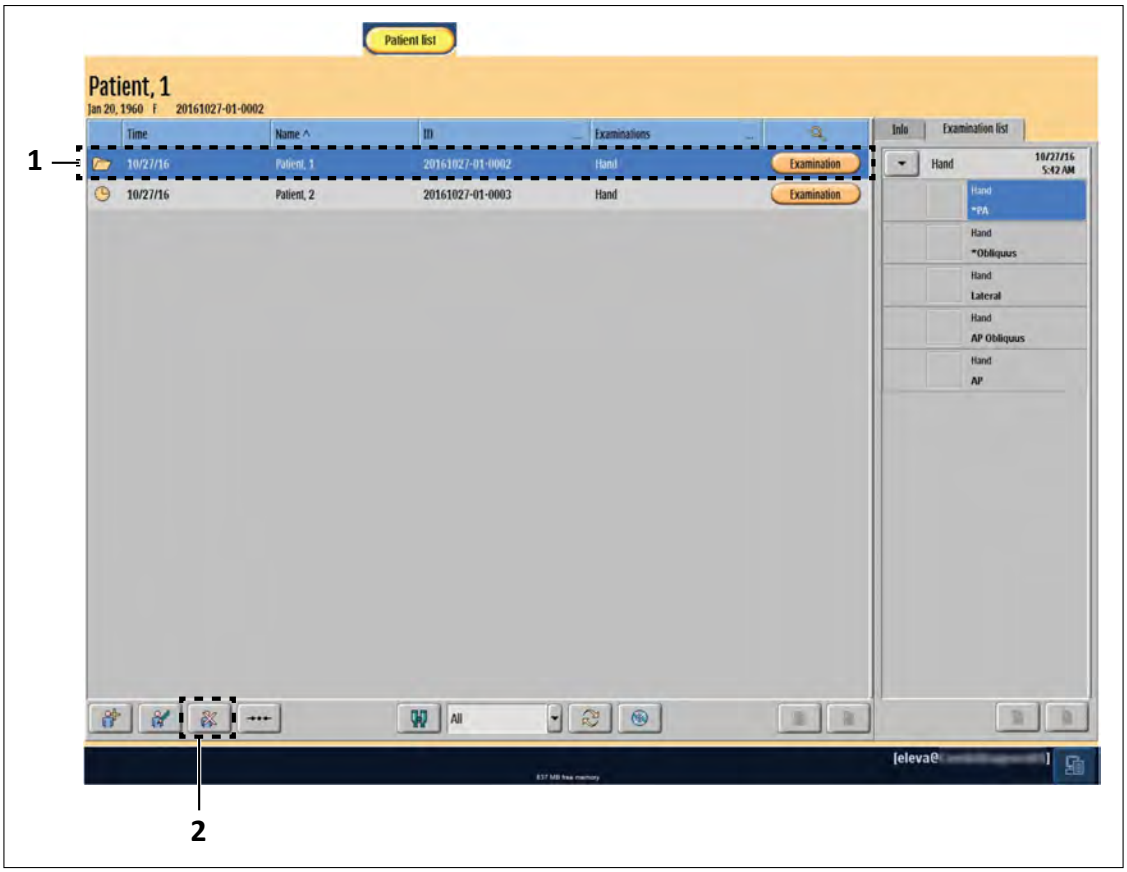
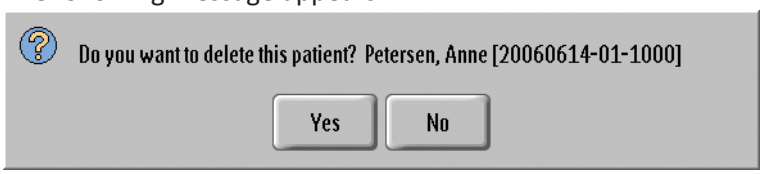


► Select the patient name (1).

⇨ The background of the patient's name turns blue.

► Click (2) to delete all data in this line.

⇨ The following message appears:



Yes

► Confirm deletion.

⇨ The patient is deleted from the patient list.

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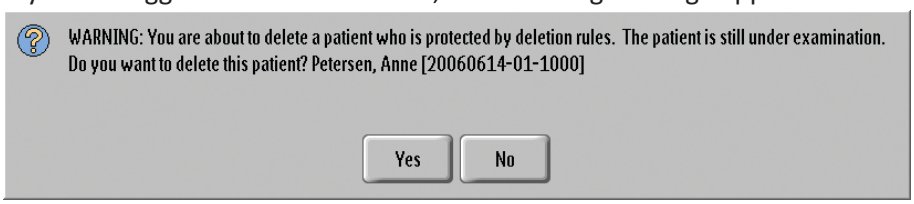
NOTICE

If an examination of the patient has not yet been completed, the normal user cannot delete the patient.

If you are logged in as administrator, the following message appears:



If you nevertheless want to delete the patient from the patient list, proceed as follows:

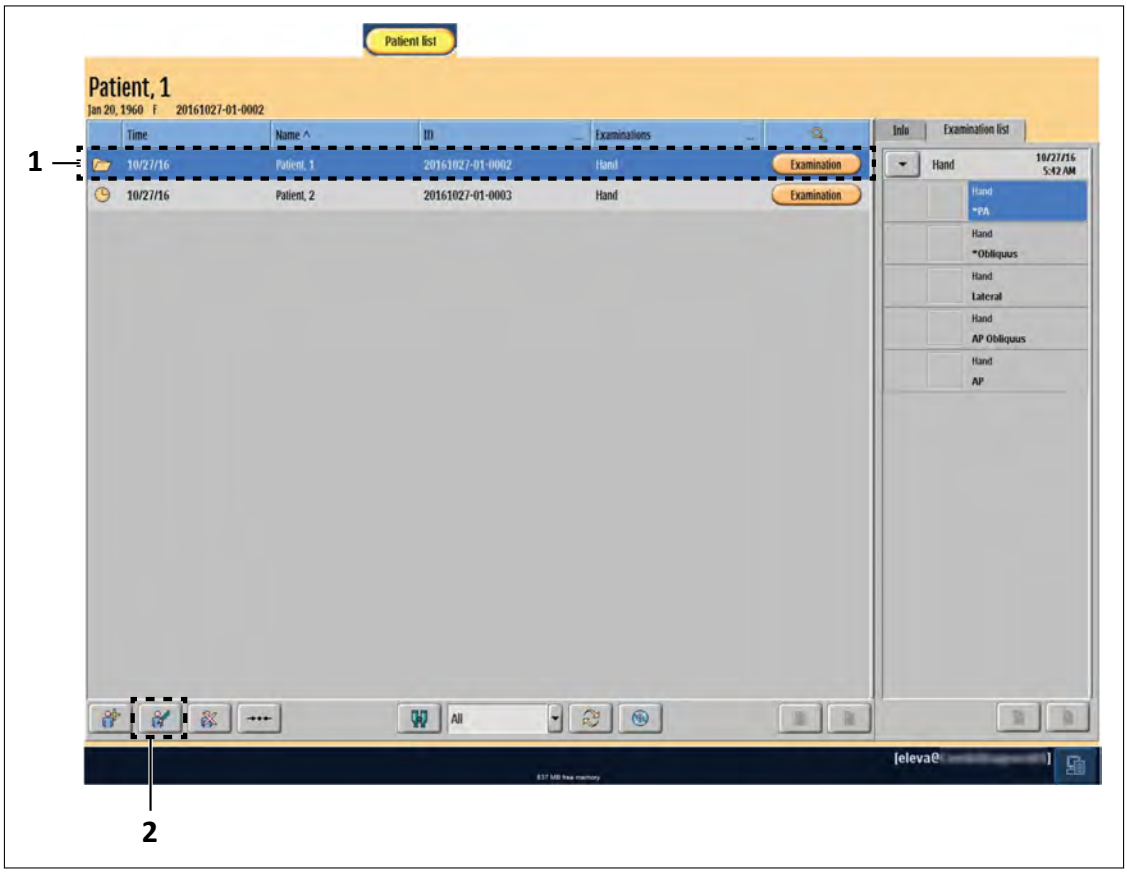
Yes

► Confirm the message.

⇨ The patient is deleted from the patient list.

Editing the Patient Data and Examination Data

Assuming you are in the **Patient List** section:

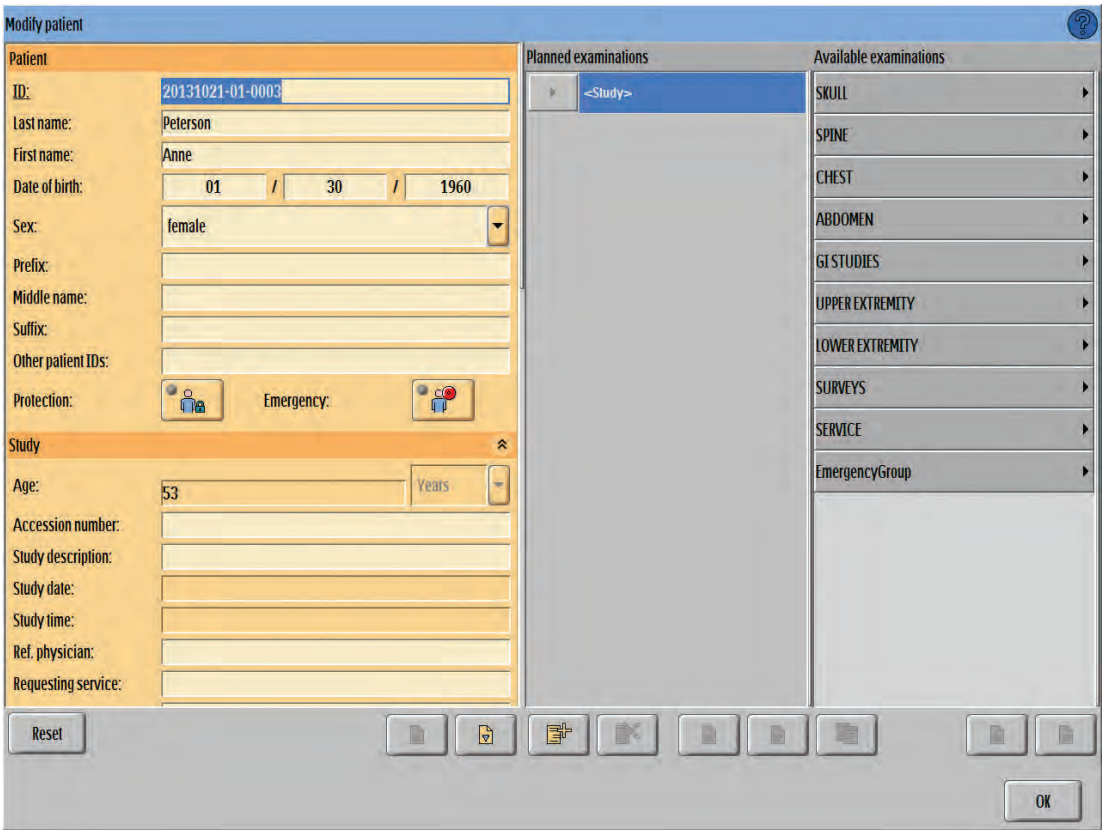


► Select the patient name (1).

⇨ The background of the patient's name turns blue.

► Select "Edit data" (2).

⇨ The window for patient and examination scheduling appears:



► Click the field you want to edit.

► Edit the patient data and examination data.
If you work with a touch screen, the virtual keyboard appears on the screen – if so configured.

► Add new examination types (see chapter "Adding the Examination Types" on page 73).

Collapsible Folders for Study and Examination

Use the arrows to open and close the folders **Study** and **Examination**.

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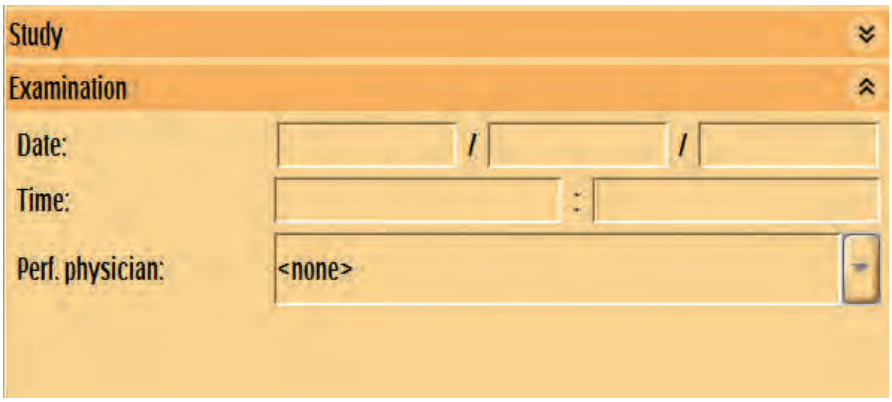

Fig. 7: The folder **Study** is closed.

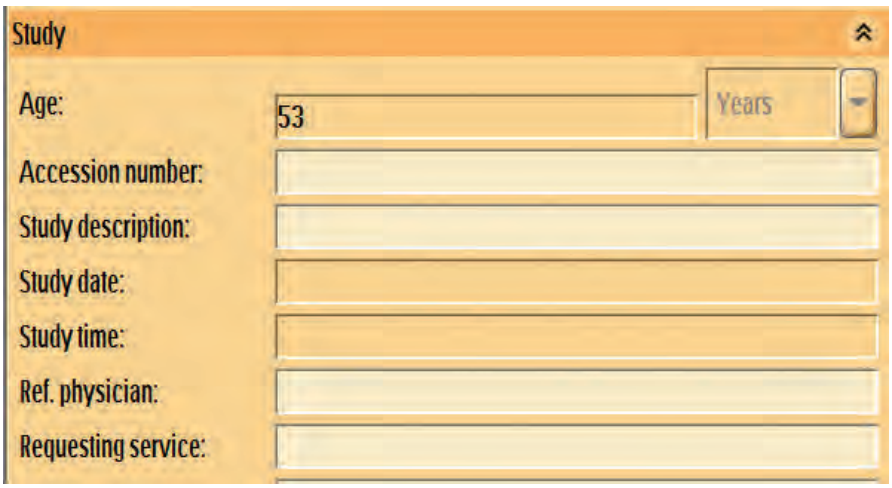

Fig. 8: The folder **Study** is open.

Getting Patient Data From RIS

Updating the Patient List

NOTICE

The RIS query is either done automatically by the system (at a set time interval) and/or can be initiated by the user when needed.

Assuming you are in the Patient list:

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► Start the RIS query.

⇨ The button stays blue while the query is in progress.

⇨ During that time, new patients' data are added to the list.

⇨ Existing patient data and examinations are updated, unless they have already begun.

⇨ Patient data and examinations that are no longer required are deleted.

⇨ After the query the list is resorted.

⇨ After the query the patients with planned examinations not included in the response from RIS are deleted and disappear from the list.

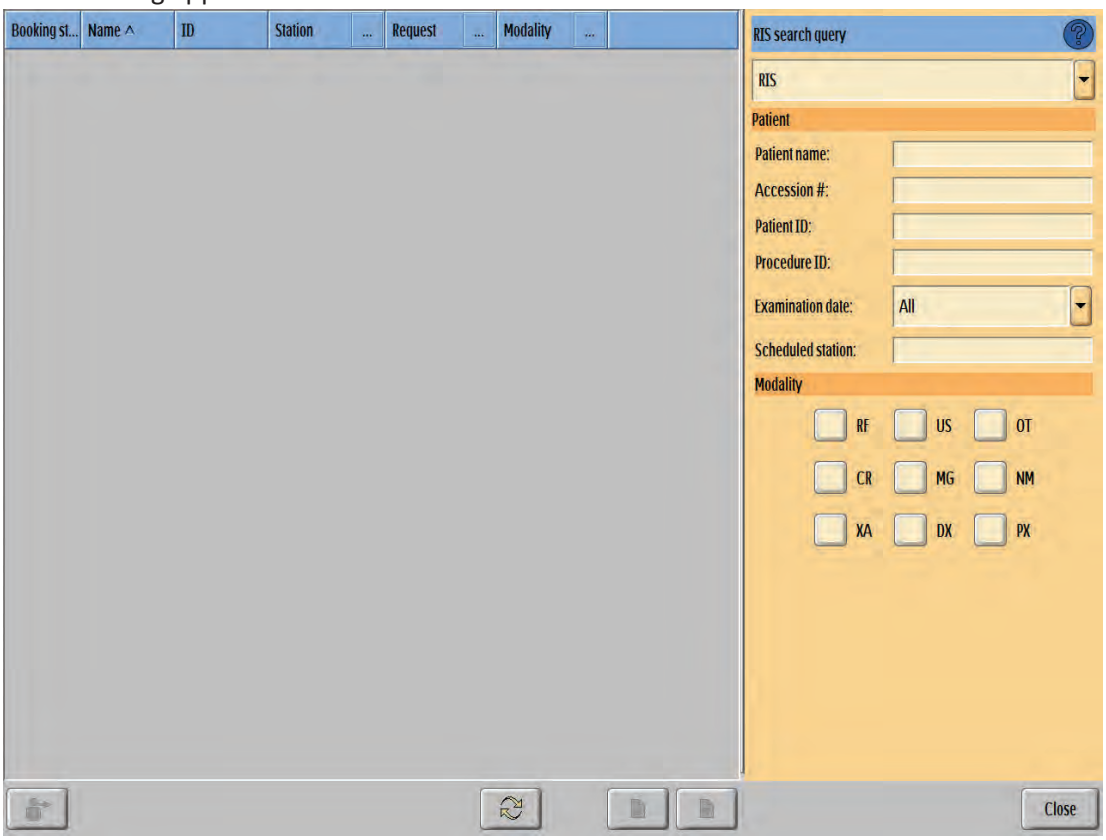
► To stop the query, if necessary: click the button again, while it is blue.

Getting Individual Examinations From RIS

You can search for a particular patient from the RIS and transfer the data to the system.

► Start search function.

⇨ The following appears:



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On the right you can do the following:

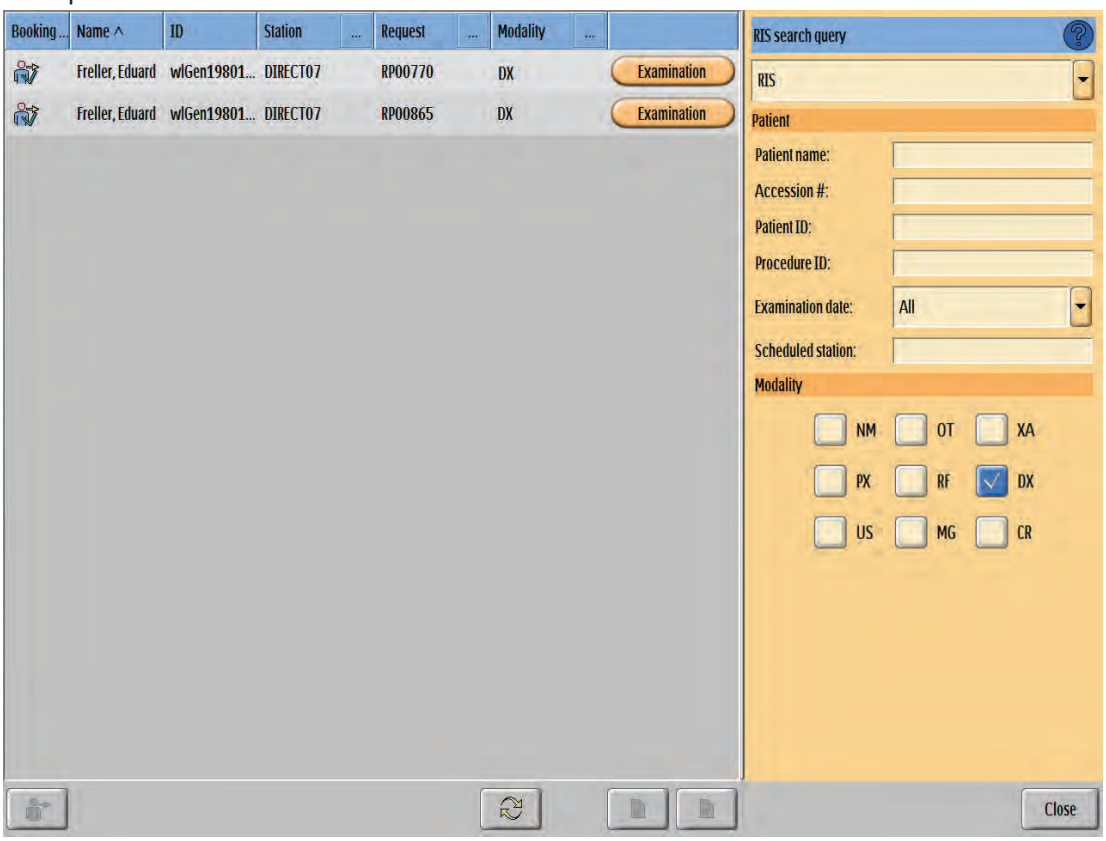
- Enter one or more criteria to precisely narrow down your search.
- Enter wild card criteria using “.....*” or “.....?...” to narrow down your search.
- Choose from a list of modalities:
  – CR + DX = Digital Radiography
  – OT = Other
  – US = Ultrasound
  – MG = Mammography
  – RF = Radio Fluoroscopy
  – XA = X-Ray Angiography
  – PX + NM = Nuclear Medicine

► Start the RIS query.

NOTICE

If necessary, you can stop the query: Click the button again while it is blue.

⇨ The button is blue for as long as the query is in progress. During that time, all examinations matching your criteria appear.
Example:



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⇨ Patient is already in the patient list

Patient is not yet in the patient list

► Select the patients you want.

► Add patients to the patient list.

► If you have selected one patient only, you can add the patient to the patient list and automatically open the examination section for this patient at the same time:

For this, click the **Examination** button for the patient in the query list.

Close ► End RIS query.

Getting Individual Images from PACS (Optional)

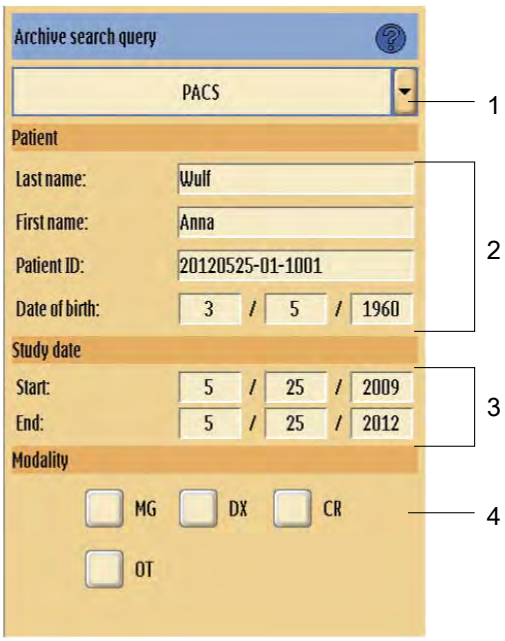
The Search function enables you to retrieve a patient's images from the PACS archive to the local system.

▷ In the **Patient list**, a patient is selected.

► Start the **Search** function.

► On the right hand side, select your PACS archive from the drop-down list.

⇨ The patient data of the selected patient is shown.



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No.	Description
1	Selected archive
2	Patient data: Patient name, patient ID, and date of birth
3	A time range of 3 years is automatically selected. You can change the time range to your needs.
4	You can select one or more modalities. The selection of the latest query is shown.

► Start the query.

⇨ The button is blue as long as the query is in progress.

⇨ During that time, all examinations that match your criteria appear.

NOTICE

To stop the query, click the button again, while it is blue.

► Select the examinations that you want to retrieve.

► Retrieve the examinations.

Status	
	Examination is not retrieved yet.
	Examination is retrieved successfully.
	PACS sends images to the system.
	Retrieval has failed.

Close

► End the PACS query.

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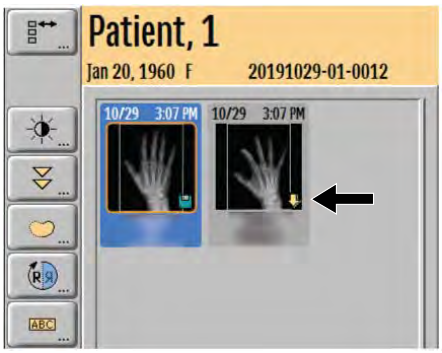
⇨ In the **Review** section, you will find all images. The retrieved images are marked with an arrow.



You can use the following image manipulation tools on retrieved images:

- Setting contrast and brightness
- Scaling
- Measurements, but no calibration
- Rotation

Previously made annotations are always shown.

For some secondary capture (SC) images the measurement tool might not be available.

Depending on the configuration of your system, you can search the PACS archive for examinations of other patients as well. In this case, the **Last name**, **First name** and **Patient ID** fields are editable.

To search the PACS archive for examinations of other patients, do one of the following:

- Change the data in the search query.
- Enter wild-card criteria to narrow down your search (for example, “*” or “?”).

To reduce the query time, be as precise as possible. Enter at least the patient ID, the first name or the last name.

Starting an Examination

When you have entered all the data, you may immediately begin the examination entered or plan further examinations.

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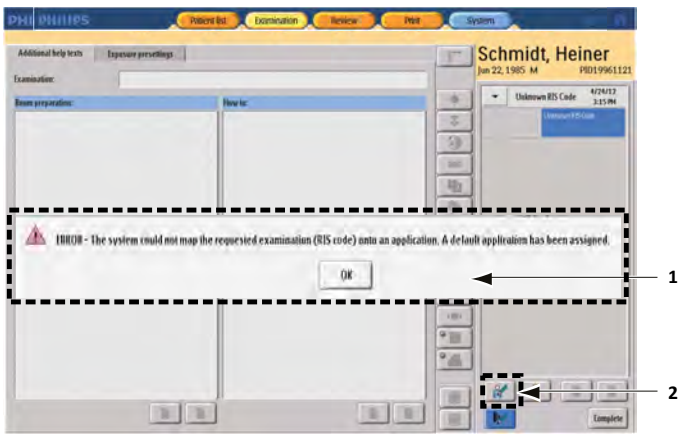
- Select a worklist entry (patient) (**1**).
- Press the task button “Examination” (**2**).

⇨ The examination page appears.

Unknown RIS Code Mapping

The system automatically assigns the examination type and patient data according to the data received from the RIS. If no examination type can be assigned to the RIS code received from the RIS, the examination is scheduled as “unknown RIS code” and the following window appears:



- Press the **OK** (1) button.

- Select “Edit data” (2).

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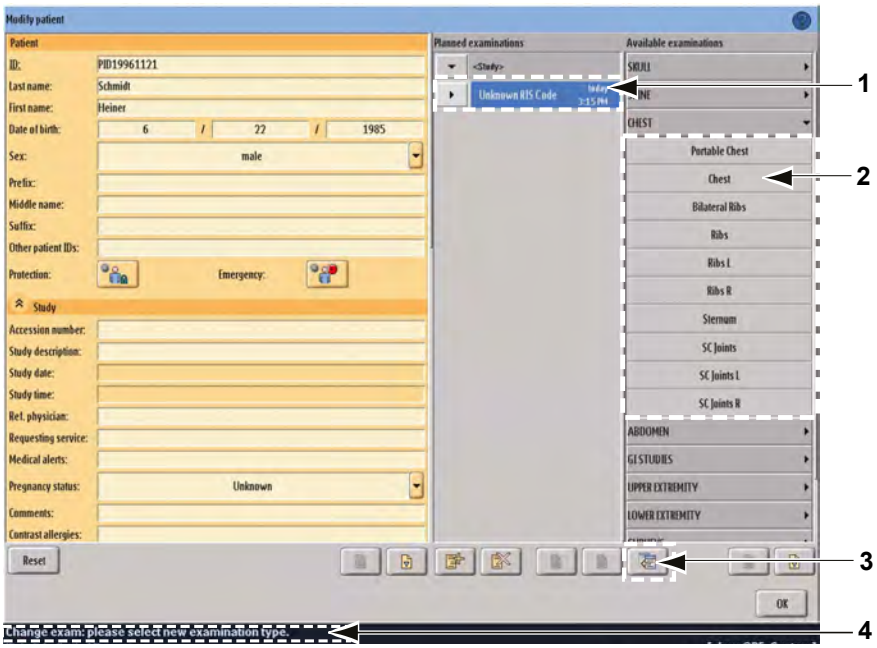
⇨ Patient and Examination Scheduling appears:



► Click the examination type (1) you want to replace.

► Select “Change examination type” (3).

⇨ The button turns blue.

⇨ The following message (4) appears: “Change exam: please select new examination type ”.

► Select new examination type (2).

⇨ The examination type is exchanged.

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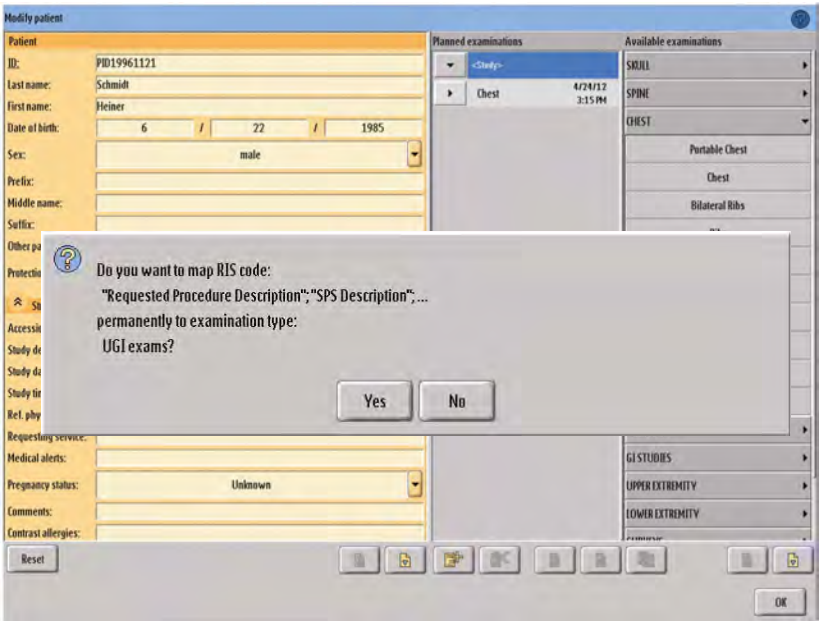
⇨ Depending on your system configuration, the following message may appear:



⇨ If you confirm with **Yes**, the examination type will be permanently assigned to this RIS code for this examination.

⇨ If you click **No**, the examination type is assigned only to this patient. The examination type will not be permanently assigned to this RIS code.

NOTICE

When you return to the patient list, perform a refresh of the work list to apply the modified RIS code to the existing examinations in the work list.

Starting a Default Examination Without Planning

If you plan to make exposures with the **Free cassettes** registration device only, it is not necessary to enter patient data into the system.

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- ► Press the “Shortcut” button (**1**), default examination with no patient selection.
- ⇨ A request for the configured default examinations without a patient name is added in the system and immediately selected.
- ► Select the desired exposure program.
- ⇨ The examination can begin immediately.

NOTICE

In this mode, exposures with the digital flat detector cannot be made.

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9 Performing the Examination

General aspects

NOTICE

The following aspects refer to the quality of radiographic imaging in general.

► To achieve appropriate image quality and radiation dose, confirm the following:

- The detector has been properly calibrated in the recommended time range.
- The correct EPX program setting is used.
- The correct view and therefore the correct image processing is used.
- The correct SID is used.
- The collimated field of view is as small as possible for the anatomical region to be imaged.
- If necessary: The correct filter and grid are used.
- The target exposure index EI_T is in the recommended range.

NOTICE

Image processing is an integral part of digital X-ray systems. It serves to optimize the display of the digital image on a laser film hard copy or a reading station monitor. The Eleva Workspot encompasses UNIQUE2 image-processing software, a multifrequency processing that enhances structural details while limiting noise.

Examination Section

The Examination section contains all displays and tools for a radiography and fluoroscopy examination.

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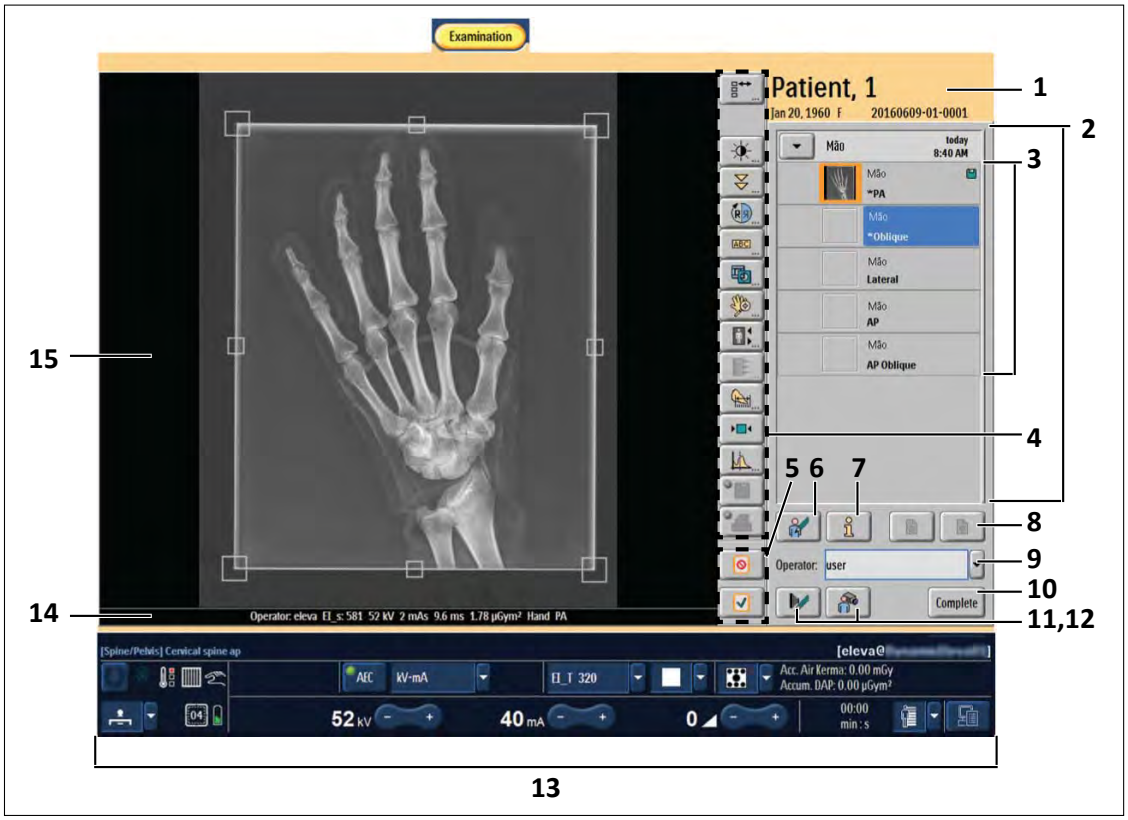
Overview Examination on Eleva Workspot



No.	Symbol	Meaning
1		Information on the selected patient.
2		Display of examination folder.
3		Examination work list with an examination folder displayed.
4		Toolbar for image manipulation. For further information, see “Image Manipulation Tool Functions”.
5		Accept or reject the selected image.
6		Edit patient data.

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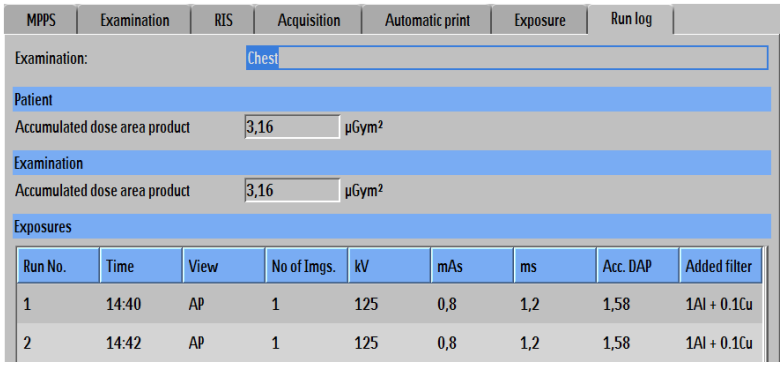
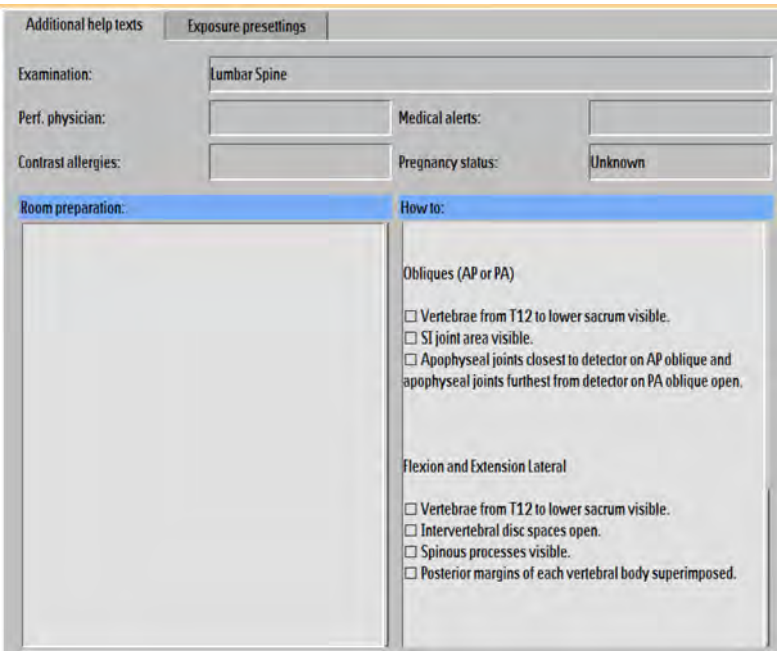
No.	Symbol	Meaning
7		Display information on the selected examination or view, for example the Run log. 
8		Scroll through the examination list.
9		Change the operator's name.
10		Complete the examination.
11		Display additional help texts or exposure presettings. 

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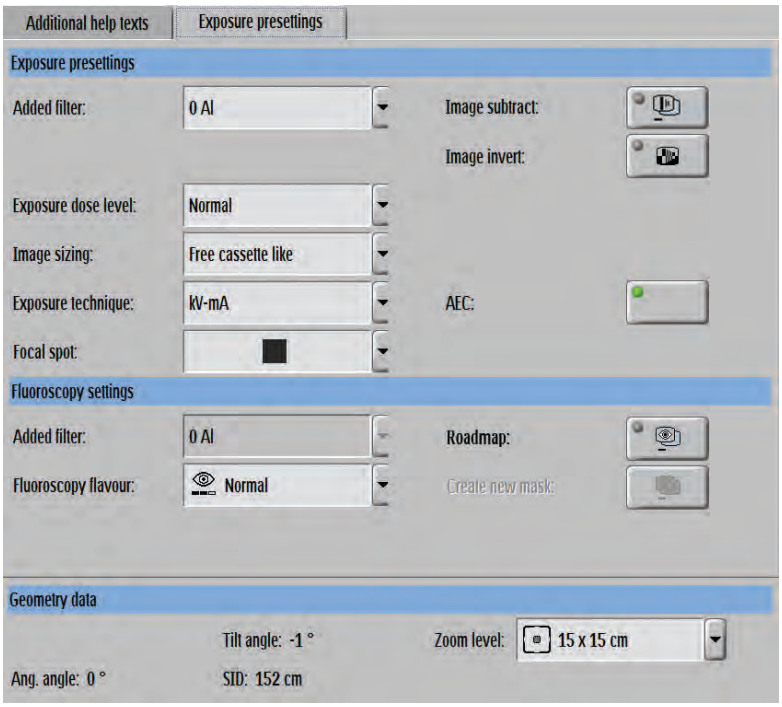
No.	Symbol	Meaning
		
12		Display the image from the live camera (optional)
13		Set exposure data.
14		Exposure and examination information.
15		Display of the selected image/view.

Preview Image at the Eleva Tube Head

The preview image appears at the Eleva Tube Head for 30 seconds (default setting).

Customer service or the application specialists can set a different time interval (5 seconds to 1 minute) or disable the preview image permanently.

When the preview image is enabled, the toggle button for the preview image is available. The advanced user or application specialist can add the button to your toolbar.

Function of the button:

	LED is green: The preview image appears at the Eleva Tube Head
	LED is gray: For the current patient, the preview image does not appear at the Eleva Tube Head.

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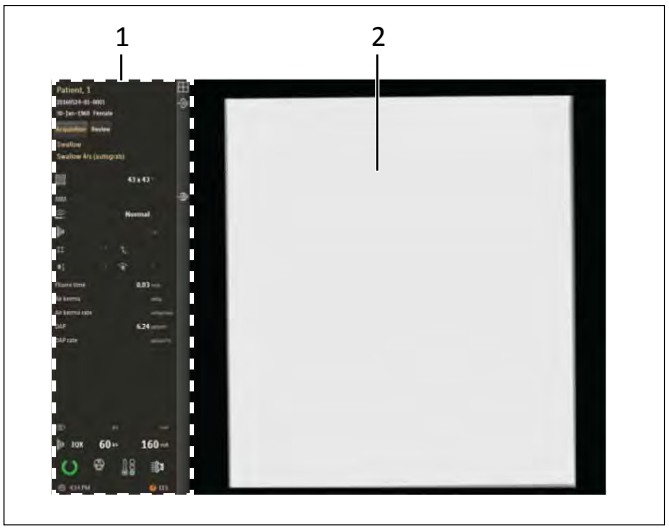
NOTICE

If you wish to switch off the preview image, press the toggle button before releasing the exposure. The preview image will be switched off until you change the patient or press the button again.

Overview Acquisition on RF Viewer



No.	Meaning
1	Acquisition information
2	View live fluoroscopy and live spot images

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Acquisition Information on RF Viewer

No.	Meaning
1	Information on the selected patient.
2	Select **Acquisition** or **Review**
Displayed Information	
3	Examination and view name
4	Acquisition parameters
5	Appears when dynamic fluoroscopy grab (auto grab) is active
6	Appears when the grabbed image is saved
7	Appears with the last image hold

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Generator Control Area

Fig. 9: Generator control area on the operator's console (example A: radiography examination, example B: fluoroscopy examination)

No.	Icon	Explanation	
1		Radiation ON	
2		Tube temperature	
		Color	**Meaning**
		Green	Heat units <5%
		Yellow	Heat units between 5% and 70%
		Yellow + Red	Heat units between 70% and 100%
		Red	Heat units 100% The thermo safety switch in the tube assembly is active: No exposure is possible.
3		Grid inserted	
		No grid inserted	
		Grid inserted but not required	

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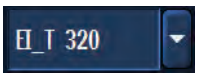
No.	Icon	Explanation
		This is only displayed when the registration device wall stand or free detector is used.
		Grid not inserted but required This is only displayed when the registration device wall stand or free detector is used.
4		Icon appears when exposure program has been changed manually.
5		Turn on/off Automatic Exposure Control (AEC)
6		Select exposure technique: kV-mA, kV-mAs, kV-mAs-ms, kV-mA-ms
7		Target exposure index EI_T. For further information, see “Exposure Index”.
8		Select focal spot: large, small, or variofocus (optional)
9		Table: Select AEC measuring fields from the drop down menu
		Wall stand: Select patient rotation and AEC measuring fields
10		Display • In ready mode: – Display of accumulated air kerma (upper line) – Display of accumulated dose area product (lower line) • When X-ray is on: – Display of actual air kerma rate (upper line) – Display of actual dose area product rate (lower line) If an air-kerma limit is set and the accumulated air kerma exceeds this limit, the following will be shown: • A message appears on the operator’s console.
11		System status display

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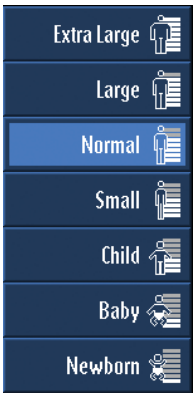
No.	Icon	Explanation
12		Select patient type. You can manually select a different patient type.  Each patient type provides an appropriate image processing as well as generator settings, for example, kV, mAs, focal spot.
13		Adjustment keys for setting kV, mAs, ms (dependent of technique)
		Adjustment key for exposure correction One exposure point = 25%
14		Battery status of portable detector
15		Designation of the last detector shared in the system:
		Large detector. This example shows a large detector with the identifying number “04”.
		Small detector. This example shows a small detector with the identifying number “01”.
16		Drop-down button with display of selected registration device. You can select from the following registration devices:
		Fluoroscopy and spot images
		Table
		Wall stand
		Free cassette with X-ray tube of table

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No.	Icon	Explanation
		Free cassette with X-ray tube of CSM
		Free detector with X-ray tube of table
		Free detector with X-ray tube of CSM
		Radiation disabled (no registration device selected)
17		Ready for exposure release
18		Display of current examination or user guidance
19		Lock-in (fluoroscopy control data locked)
20		Fluoroscopy speed
21		Select AEC measuring fields
22		Accumulated fluoroscopy time for current examination
23		Select exposure frame

CAUTION

If no registration device is selected, radiation is disabled.

NOTICE

Most of the functions are programmed in the EPX by default and can be manually selected according to your needs.

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Battery Status of the Detector on the Eleva Workspot

Symbol	Color	Charging level	LED at detector	System status
	Green	80%–100%	Green	Exposure possible
		60%–80%		
		40%–60%		
		20%–40%		
	Yellow	10%–20%	Red	Exposure possible for approx. 5 more images/10 min
	Red	5%–10%	Red	If the ready symbol appears, exposure is possible.
		<5%	Flashing red	No exposure possible. A message appears, that the battery is empty.
	Gray			No battery information No exposure possible.

Exposure Presettings

Assume that you have scheduled a fluoroscopy examination for a patient. As soon as you first go to the Examination section the additional help texts shows up.

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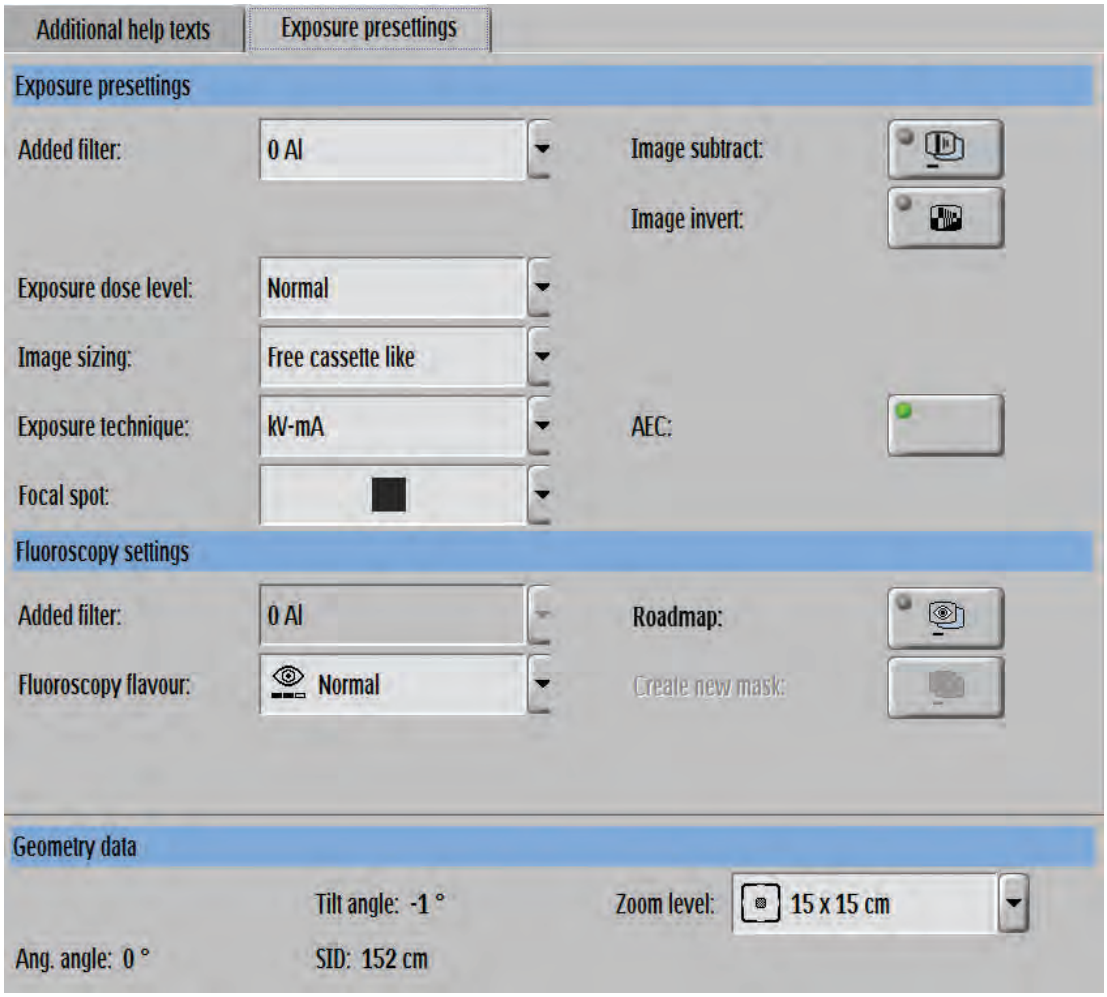
► Go to **Exposure presettings**.



► You can change the following data to your needs:

- Exposure presettings
- Fluoroscopy settings
- Geometry data: zoom level.

► Click this to call up the exposure presettings whenever needed.

► Make your desired changes.

► Click this to return to previous screen.

Exposure Parameters

Depending on the registration device selected, there are various exposure parameters to choose from. Only those parameters are displayed at the operator's console that are available for the selected registration device.

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Radiography parameters can be changed in the generator area of the operator's console.

Fluoroscopy settings can be changed here:

- in the generator area of the operator's console
- on the exposure presetting screen of the operator's console
- at the control console.

The following table shows the parameters/functions that can be changed for each registration device:

Parameter/Function	Fluoroscopy	Table	Free Cassette	Free Detector	Wall Stand
Automatic exposure control ON/OFF	x	x			x
Exposure technique	x	x	x	x	x
Amplimat measurement field combination	x	x			x
Film-screen combination			x		
Target exposure index (EI_T)		x		x	x
Focal spot	x	x	x	x	x
Added filter	x	x	x	x	x
Patient type	x	x	x	x	x
Image frequency	x				
Image dose reduction	x				
Image polarity	x				
Series exposure	x				
Fluoroscopy flavors	x				
Fluoroscopy frame speed	x				
Fluoroscopy lock-in	x				

Automatic Exposure Control (AEC)

	Automatic exposure control ON	Automatic exposure control OFF *
Exposures with minimal exposure time	kV	kV-mAs
Exposures with constant current	kV-mA	kV-mA-ms or kV-mAs-ms
Exposures with preset exposure time	kV-ms	kV-mAs-ms

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	Automatic exposure control ON	Automatic exposure control OFF *
IQX	Automatic kV	kV-mA-ms or kV-mAs-ms

* The exposure technique selected when you switch from automatic ON to automatic OFF is defined in the system. This is the default from the system and can be changed manually in the drop down menu on the generator area.

IQX

AEC must be on. IQX is possible for spot exposures only.

For an optimal image quality, the dose is adapted to the thickness of the object within the first milliseconds. This is done by correcting the relevant X-ray parameters during the examination, if necessary.

IQX must be set in the parameters by customer service.

Switching AEC On/Off

► Click this on the Eleva Workspot to switch AEC on.

⇨ The LED lights up green.
Or

► Touch this on the control console.

⇨ The button is framed yellow.

Selecting the Amplimat (AEC) Measuring Field

NOTICE

The measuring field combination can only be selected when the registration device “Table” or “Fluoroscopy” is selected.

Make sure that the anatomy covers the selected measuring fields.

► Choose the desired measuring field.

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Symbol	Meaning	Recommended use
	Small centre field	Used when a smaller measuring field is needed, for example, arthrograms, skull, shoulder, hip.
	Large centre field	Used when a larger center measuring field is needed, for example, stomach. Used for standard fluoroscopy and spot image exposures.
	Upper side fields	Used when the outer two cell are needed, for example, chest, bilateral knees.
	Upper side and centre fields	Used when all three cells are needed, for example, abdomen.
	Middle vertical fields	Used when a vertical slit is needed, for example venograms of a single leg, esophagus examinations.
	Upper and lower side fields	Used when two vertical slits are needed, for example bilateral knees.
	All measuring fields	Used when a large measuring field is needed, for example, barium enema, stomach. Used for standard fluoroscopy and spot image exposures.

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Radiography

Examination with Detector

WARNING

For exposures on the portable detector, make sure that the free detector registration device is selected at the Eleva Workspot.

NOTICE

To avoid data loss, save (PACS) or print images as soon as possible.

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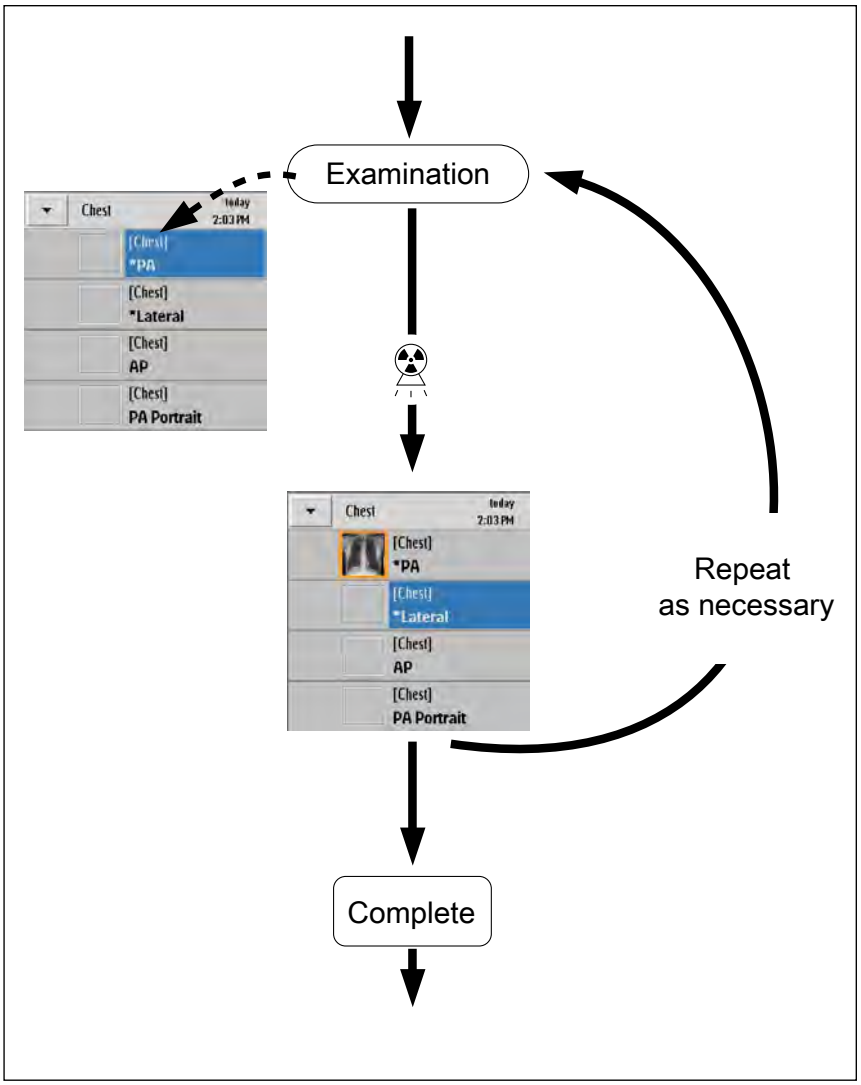
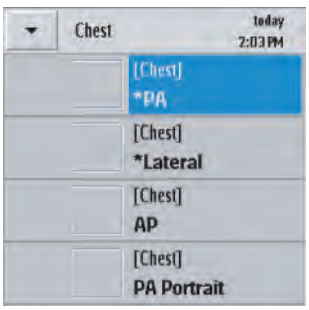


Fig. 10: Working with detector

Assuming you have selected a patient and you are in the Examination section:

▷ The first view of the examination type is selected (background is blue):



► Select the appropriate registration device.

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NOTICE

When you are using the wireless portable detector with the wall stand bucky unit, select the wall stand registration device. Nevertheless, ensure that you follow all safety and usage instructions for the wireless portable detector.

NOTICE

When you are taking a radiography image using the geometry, select the table registration device.

- ► When using the wireless portable detector, check the following:
  - WiFi connectivity
  - Correct detector is connected (identifying number in generator area)
  - Battery status of the wireless portable detector (green LEDs on the detector)
- ► Move the grid into or out of the beam path at the table.
  or
- ► Attach or remove the grid at the portable detector.
  The dose is automatically adapted.
- ► Position the detector and the X-ray tube assembly - manually or automatically, depending on your system.
  For details on moving the X-ray tube assembly, see the Instructions for Use for the X-ray system.

NOTICE

Make sure that the central X-ray beam meets the center of the detector – both at perpendicular and oblique exposures – depending on the examination.

- ► Position the patient.
- ► Adjust the collimation field to the patient.
  Make sure that no part of the collimation field is outside the detector area.
- ► Check if the green "ready indicator" in the lower left corner of the screen is lit. Exposures can only be released, if the detector and workstation are ready.

  Ready:  "ready indicator" is lit (green)
  Not ready: "ready indicator" is not lit (gray)
- ► When the CSM is available, make sure to select the correct exposure switch.
- ► Release the exposure.

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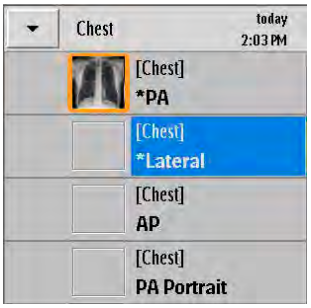
⇨ The image appears after a short moment on the Eleva Workspot screen. Image processing has two steps with an interval of several seconds. After the second step, a fully processed image is displayed in the viewport.

⇨ The next standard view is automatically selected. (Standard views are marked with *.)



► To select a different view than the next standard view, click on the view you want.

⇨ The background of the selected view turns blue.

► Repeat these steps until all the necessary patient exposures have been made.

NOTICE

You can simultaneously view an image and release exposure into a different view.

► Verify the image post processing.

► Complete the examination.

⇨ If AutoExport/AutoPrint is active, images are exported/printed.

Making More Than One Exposure with the Same View

The procedure is the same as for two or more separate views, the only difference being that you first must open the view. You can reassign a view that has already been done or assigned; this then results in two views.

► Select view again.

► Release exposure.

- View is split up into two.

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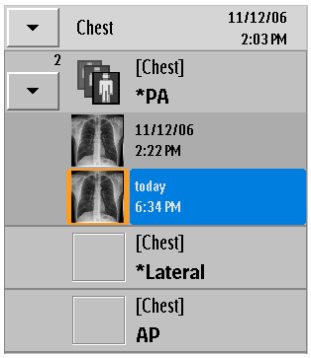
- Result:



Moving Images Between Examinations

This function is active in the Examination section only.

The system supports moving an image from one view to another if you have either released an exposure for the wrong projection or patient folder and did not realize your mistake until later.

In principle, this tool works in the same way as cut, copy and paste in other software programs.

The following applies:

- The destination may be in the same examination or in another examination or even in another patient's examination.
- The original image will be cut and stored in the destination.
- For safety reasons, when you move an image, all user changes will be deleted from the image, and the destination view settings will be applied, for example, rotation, flip, electronic shutter. Be aware, that also all automatic annotation that are configured for the view will be removed.

Moving an Image from One Examination to Another on the Same Patient

Examination

► Select Examination section.

► Select the image to be moved; it will be given an orange frame.

► Select the destination, which may be another view or another examination on the patient. It will be highlighted in blue.

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► Select “Move image.”

Select ► Click this.

Move ► Click this;
if you select **No** in the following confirmation prompt, you cancel the procedure.

Yes ► Confirm image movement.

Close ► Exit the operation.

Moving an Image from One Patient's Examination to That of Another Patient

Examination ► Select **Examination** section.

► Select the image to be moved; it will be given an orange frame.

► Select “Move image.”

Select ► Click this.

Patient list ► Select **Patient List** section.

► Select the patient to whom the image is to be moved.

Examination ► Select **Examination** section.

► Select the destination, which may be another view or another examination on the patient.
It will be highlighted in blue.

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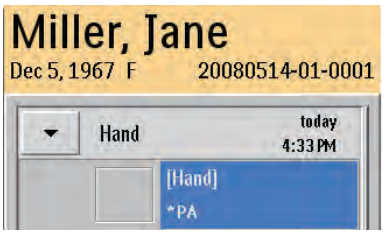


► Select “Move image.”

⇨ A warning message appears.

► Confirm with **OK**.

Move ► Click on this;
if you select **No** in the following confirmation prompt, you cancel the procedure.

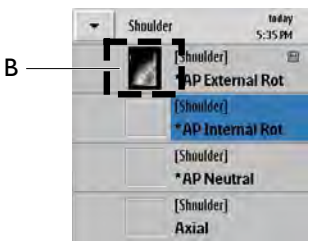
Yes ► Confirm image movement.

Close ► Exit the operation.

Checking the Image Quality on the Operator's Console

The patient has been X-rayed and images have been read out from detector. This section tells you how you can check the image quality and how you can improve it.

As soon as the images are read out, they appear as thumbnails (B). An orange frame indicates that this image is displayed in the viewport.



► Check whether the image matches your expectations. For example:

- Correct positioning?
- Correct technique?

To improve the image quality, you can use several image manipulation tools either in the Examination section or the Review section. For example:

- Correct view?
- Rotation or flipping necessary?

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- Should the image be annotated?
- Does the image have to be re-shuttered?
- Contrast and brightness

If the image quality is suitable for diagnosis, you may confirm the image:

► Click this to confirm the image.

⇨ A small green tick appears.

NOTICE

If you turn AutoExport on, you do not have to confirm every single image. As soon as you click **Complete**, all radiography images are exported automatically unless they are rejected.

If the image quality is not suitable for diagnosis and cannot be improved, you should reject the image:

► Click this to reject the image.

► Repeat the exposure.

NOTICE

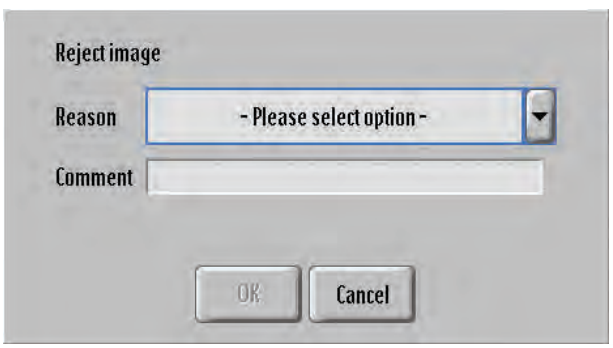
Sending Rejected Images to the PACS

You can send the rejected images automatically or manually to the PACS (see chapter “Reject Reasons” on page 258).

Workflow with Enabled Reject Reason

You can give a reason, if this is enabled in the system. How to enable/disable the reject reason is described in chapter “Reject Reasons” on page 258.

When rejecting an image, the following screen appears:



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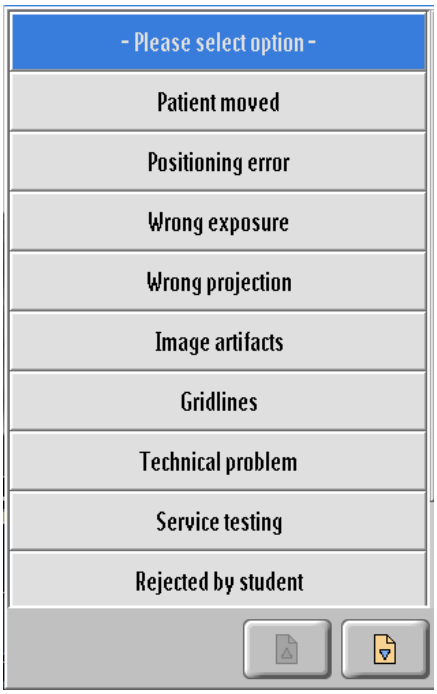
► Click the arrow. A pull down menu appears (example):



► Select the reject reason.

► Type a comment if requested.

OK ► Confirm.

Or

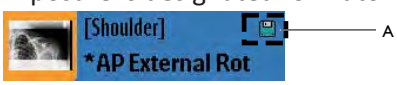
Cancel ► Cancel.

Exporting Images, Printing, and Completing the Examination

Customer Service can program the function “AutoExport” and “AutoPrint” . AutoExport sends the images to a connected PACS system for storage.

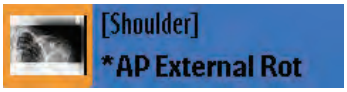
► Check whether images are designated for AutoExport.

⇨ Exposure is designated for AutoExport: symbol (A) appears



⇨ or

⇨ Exposure is not designated for AutoExport: no symbol.



⇨ To activate AutoExport:

► Turn on AutoExport function.

- LED lights up green.

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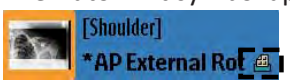
- The AutoExport symbol appears:

or

To activate AutoPrint:

► Turn on AutoPrint function.

- LED lights up green.
- The AutoPrint symbol appears:



NOTICE

If you turn AutoExport on, you do not have to confirm every single image. As soon as you click **Complete**, all radiography images are exported automatically unless they are rejected.

Complete

► Finish the examination.

⇨ Images are exported if AutoExport is activated and printed if AutoPrint is activated.

⇨ The Patient list appears.

⇨ In the Patient List, the patient is given the symbol  to indicate completion.

NOTICE

Always activate AutoExport if you are not printing all exposures to films for permanent archiving.

AutoExport will automatically export images to PACS. If AutoExport is not activated, the images are not exported automatically and you may lose data. If you archive all images to film, you do not need to activate the AutoExport function.

NOTICE

Always activate AutoPrint if you do not archive all images in PACS.

If AutoPrint is not activated, the images are not printed automatically and you may lose data. If you archive all images in PACS, you need not activate the AutoPrint function.

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NOTICE

AutoPrint

Parts of the image may be cut off if all of the following conditions apply:

- The image is larger than the film.
- AutoPrint is active.
- In **System/Settings/Print settings/General Items** the **Illegal scale behaviour** is set to **Cut**.

Make sure you are using AutoPrint in such a way that you meet your legal obligations for documentation.

NOTICE

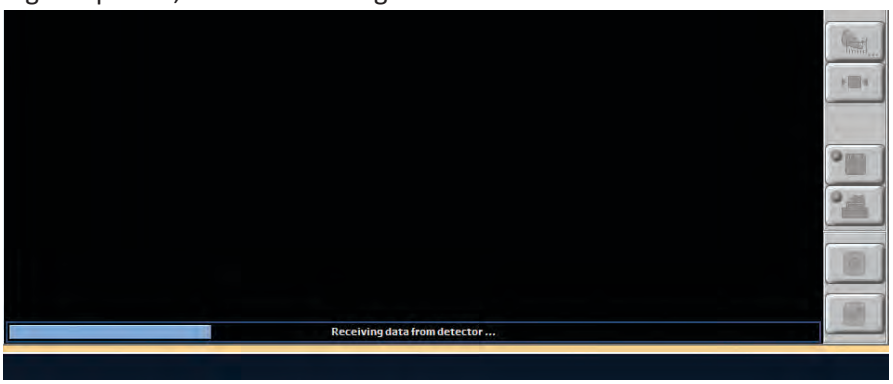
Confirmed examinations and the associated images will be deleted automatically by the system at any time if necessary (for example, no disk space).
Service can install default protections, but there is always a compromise between free capacity and images that have to be protected against deleting.

Deactivating Automatic Confirmation

Your system can be set to automatically confirm exposures. In this case, every exposure is automatically confirmed after readout.

If you would like to retain the possibility of editing images before saving or printing them, proceed as follows:

► While reading out, a blue increasing bar appears at the bottom of the expected image. During this period, click on the image.



⇨ Automatic confirmation is switched off.

⇨ A corresponding message appears.

► After editing, you can confirm the image with  .

⇨ The image is automatically printed and exported as normal.

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Using AutoPrint

The image is designated for AutoPrint with or without a user check (can be configured per examination). You can see this here and, if you wish, you can stop the print job, as long as it has not yet been printed.
There are several printing options (configurable):

- AutoPrint without user check
  All images are printed automatically.
- AutoPrint without user check and scale conflict set to “Ask what to do”
  All images are printed automatically if no scale conflicts are detected. Images with scale conflict (for example, image does not fit on the film) are presented to the user before printing.

Exposure Index

What are Target Exposure Index (EI_T), Exposure Index (EI_s) and Deviation Index (DI)?

With conventional X-ray one can tell an incorrect exposure straight away from the density of the film. With digital systems, there is no discernible direct connection between density and image receptor dose. For this reason, the Eleva Workspot has a dose indicator, which is proportional to the image receptor dose.

The dose indicator provides a reference to the relative image receptor dose of each exposure by means of the EI_s value (exposure index, signal-based). In accordance to the IEC 62494 it is determined in the relevant image area or region of interest (ROI).

In addition to the EI_s, the system provides a target exposure index (EI_T) and a deviation index (DI). The target exposure index (EI_T) enables the user to define a target exposure index for the planned exposure. The deviation index (DI) quantifies the deviation between the EI_s and the EI_T.

In the **Examination** and **Review** section the EI_s, EI_T and DI values appear below the image along with the exposure and examination data. The deviation index is visualized by a color indicator (green/yellow/red):

Workflow

Before the image acquisition:

► Check the EI_T in the generator area. It shows the predefined dose level for the exposure.

If required, select a different EI_T value.

After the image acquisition:

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- Check the DI below the image. It shows the deviation between the EI_T and the EI_s.
- If necessary, additionally check the EI_s below the image.

Target Exposure Index (EI_T)

The target exposure index (EI_T) is selected prior to image acquisition to determine which dose level is appropriate for the image. For AEC this value also controls the switch off dose.

Sensitivity Class (S)	Target Exposure Index (EI_T)	Switch Off Dose [µGy]
800	125	1.25
400	250	2.5
200	500	5.0

For free exposure this value determines which dose level should be used for the image.

Signal-based Exposure Index (EI_s)

The EI_s is proportional to the image receptor dose. This means that for two similar exposures of the same organ with the same radiation quality, you get the ratio between the two dose values directly from the two EI_s values.

The EI_s is calculated by an internal software (Ranger) determining the image area of interest (ROI, region of interest). This process is triggered automatically, after the X-ray exposure, or whenever the shutter tool is used. Typically, the success rate of this algorithm can be expected to be >95%. Should the Ranger have failed, the Simple Ranger Tool can be used to manually correct this. Examples for such a case could be large metal objects in the image.

Example:
Patient 1: Pelvis AP, 77 kV, AEC, **EI_s = 320**
Patient 2: Pelvis AP, 77 kV, AEC, **EI_s = 480**
480/320 = 1.5; the detector dose for patient 2 is **1.5 times higher than** for patient 1.

Typical Values for EI_T and EI_s

Body area	Adults (Small, Normal, Large, Extra large)	Pediatric (Newborn, Baby, Child)
Extremities	320	250
Body trunk	250	160
Chest	400	250
CR stitching	400	250

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NOTICE

These values apply to the default exposure settings in the anatomical database at system delivery. If you have changed the exposure settings in the anatomical database afterwards, you will receive other EI_s values.

Deviation Index (DI)

The deviation index (DI) quantifies how far the exposure index (EI_s) deviates from the target exposure index (EI_T).
This is calculated according to the following formula:
$DI = 10 \times \log_{10} (EI\_s/EI\_T)$

The deviation index can be translated to exposure points.

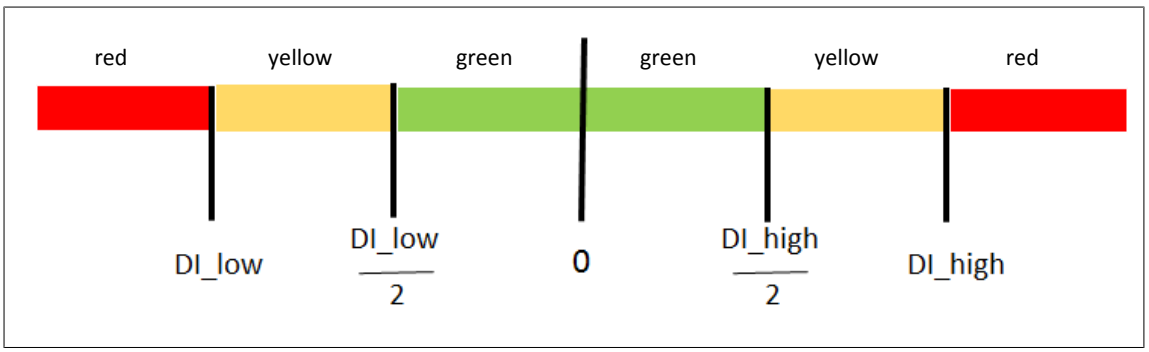
Example:
EI_T = 250,
EI_s = 400
$DI = 10 \times \log_{10} (400/250) = 2.04$
In this example you need to lower the mAs by two steps on the R10 scale. (One step on the R10 scale corresponds with one exposure point.)

The deviation index is visualized by a color indicator below the image (green/yellow/red).

The EI_s, EI_T and DI values may also appear for each image in the following cases:

- When you print the image on a print medium (only if the print template is configured to include the EI_s).
- When you save the image to an archive.
  This only applies if the archive can show the following attributes:
  - Relative X-Ray Exposure (0018, 1405)
  - Exposure Index (0018, 1411)
  - Target Exposure Index (0018, 1412)
  - Deviation Index (0018, 1413)

Color Coding for Deviation Index (DI)



The color coding helps you to assess whether the detector was exposed correctly.

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Default values:

- DI_low = –6
- DI_high= +6

Customer service can configure the DI_low and DI_high according to your needs.
The following range is possible:

- –6 to –3 for DI_low
- +3 to +6 for DI_high

NOTICE

Exposure index and dose area product

The system displays the EI_s below the image and the DAP of the examination in the generator area. There is no direct correlation between the EI_s (exposure index = detector entrance dose) and the DAP (dose area product = patient entrance dose × area).

What to Do if the EI_s Value is Not in the Expected Range

The EI_s values depend mainly on the quality of the detected ranger value and the applied dose.

If an EI_s value is not in the expected range, check the following conditions:

- Is the region of interest shuttered correctly?
- Is the “green snow” that defines the ranger value in the region of interest? Check this with the Simple Ranger Tool.
- Is an implant in the measure field? This leads to lower EI_s values. Change the region of interest with the ranger tool.
- Was AEC used for the exposure? Examinations without AEC have a wider mean variation of the EI_s values.

If you often get unexpected EI_s values with AEC (even if the patient is positioned correctly and if the measures above do not help), check with customer service if the adjustment of the AEC chambers is correct.

Image Scaling

Reference Planes

For the calculation of the magnification factor two reference planes can be configured:

- “Table plane” used for exposures which are conventionally performed with a cassette or a detector on the table top exposure.
- “Detector plane” used for exposures which are conventionally performed with the detector in the table.

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- In the Examination section press this button to display the exposure presettings.
- Under “Image sizing” you can toggle between “Free cassette like” (“Table plane”) and “Bucky equivalent” (“Detector plane”).

Image Scaling with Geometry

Free Cassette Reference

With the table the magnification for “Free cassette” is defined as 100% of the exposed object.

NOTICE

This is true only for flat objects lying directly on the table top.

The effective pixelsize is related to the table top:

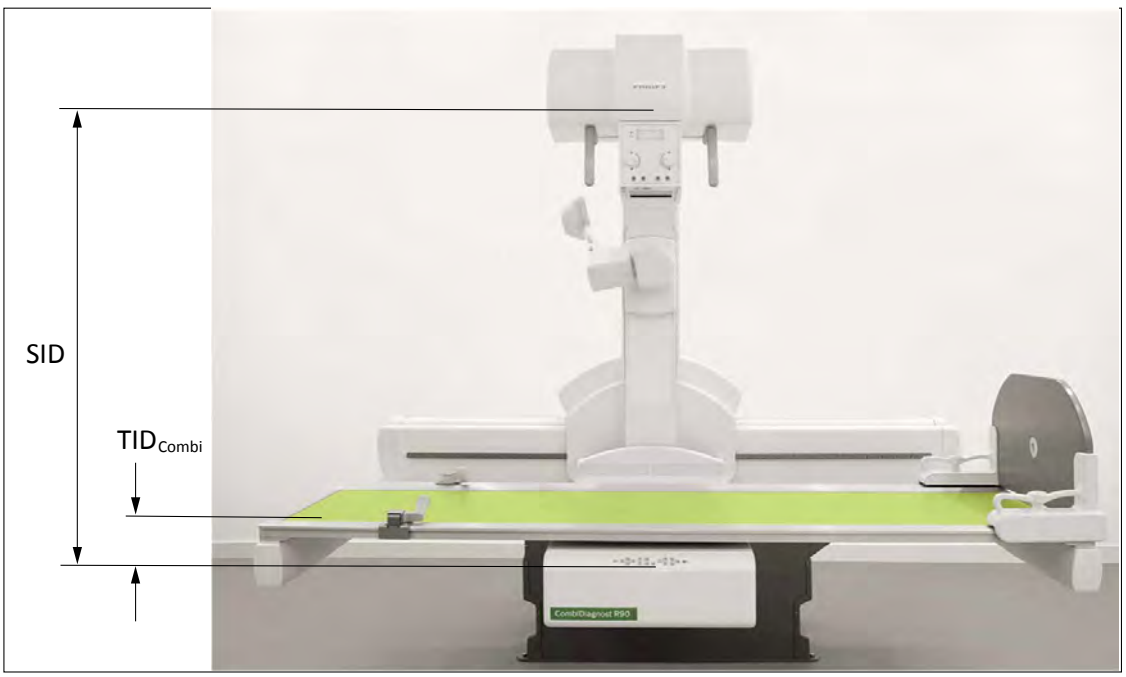
$$pixelsize_{eff} = pixelsize_{det} \cdot \frac{SID - TID_{Combi}}{SID}$$

(SID = Source Image Distance, TID = Table Image Distance)

The effective pixelsize is stored in the DICOM header of each image. It is the reference for all connected systems and is used for the calibration of distance measurements and for the size of the image on the film print out.

The pixelsize of the Trixell Pixium detector is defined as $pixelsize_{eff}$ = 148 µm.

The distance “TID” between the “Table plane” and the “Detector plane” is 110 mm (4.3 in).



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Bucky Equivalent Reference

To get a magnification comparable with images from a film-based system or a system with DigitalDiagnost TH2[1], the magnification scale in “Bucky equivalent” is:

$$scale = 100\% \cdot \frac{SID - TID_{Combi} + TID_{TH2}}{SID - TID_{Combi}}$$

(SID = Source Image Distance, TID = Table Image Distance)

Practically this means that the magnification factor is always related to the same plane, for example, the plane of the Bucky unit as in a classical Bucky system. The effective pixelsize is related to the same reference plane.

$$pixelsize_{eff} = pixelsize_{det} \cdot \frac{SID - TID_{Combi} + TID_{TH2}}{SID}$$

Within this relation, TID_{TH2} is set to fixed value of 65 mm (2.6 in). The TID_{Combi} is set to fixed value of 110 mm (4.3 in).

[1] The object size on images from systems with DigitalDiagnost TH2 is 106% of the true object.

Image Scaling with Ceiling Suspension and Wall Stand

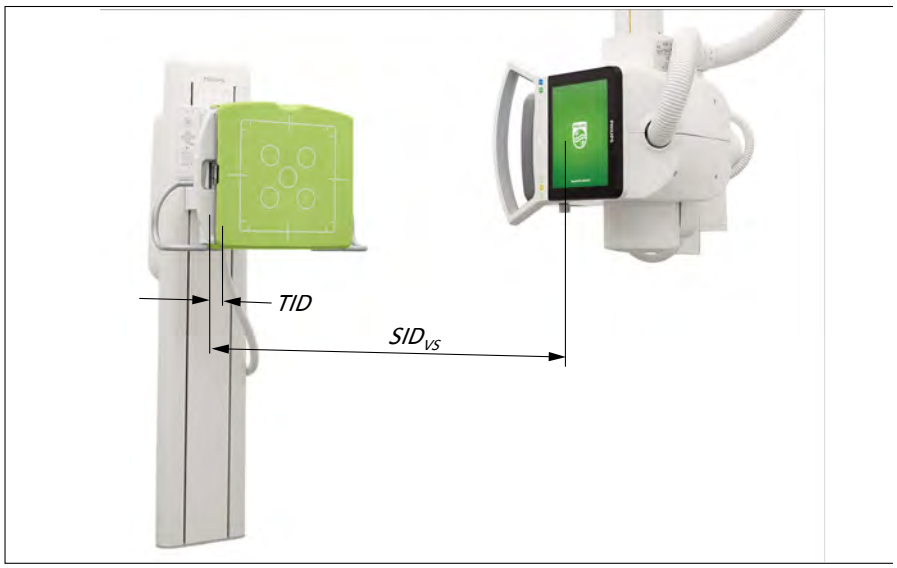
Free Cassette Reference

The magnification for “Free cassette” is defined as 100%.

The effective pixelsize is calculated according to the formula:

$$pixelsize_{eff} = pixelsize_{det} \cdot \frac{SID - TID_{VS}}{SID}$$

(SID = Source Image Distance, TID = Table Image Distance)



Bucky Equivalent Reference

To get a magnification comparable with images from a film-based system or a system with DigitalDiagnost TH2[1], the magnification scale in “Bucky equivalent” is:

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$$scale = 100\% \cdot \frac{SID - TID_{VS} + TID_{TH2}}{SID - TID_{VS}}$$

(SID = Source Image Distance, TID = Table Image Distance)

Within this relation, TID_{TH2} is set to fixed value of 65 mm (2.6 in). The TID_{VS} is set to fixed value of 45 mm (1.8 in).

The effective pixelsize is calculated according to the formula:

$$pixelsize_{eff} = pixelsize_{det} \cdot \frac{SID - TID_{VS} + TID_{TH2}}{SID}$$

[1] The object size on images from systems with DigitalDiagnost TH2 is 106% of the true object.

Stitching (Optional)

What is Stitching?

Stitching of X-ray images is of interest in case of disease patterns like scoliosis or asymmetries in the structure of leg bones. Under circumstances like these, a measurement of the leg or spine as a whole is necessary.
The system optionally supports automatic and manual joining of several images to produce one large image (for example for long leg or full spine examinations).
The stitching option is available for radiography images only.

WARNING

Always check the composite stitched image results against the single images. Automatic stitching does not mean a success rate of 100%. Successful automatic stitching depends on several prerequisites. In certain cases, some manual interventions are necessary. Therefore, check each image carefully.

Stitching can be performed at the wall stand. Stitching of spot images can be performed on the table, see chapter “Parallel Stitching”.

Stitching Workflow

General

Two or three images of one anatomical area are taken one after the other.

The provided long stitching ruler covering the overlapping areas must be used to get a proper result of the automatic stitching algorithm.

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CAUTION

Use only the Philips stitching ruler for stitching procedures. It can be ordered in the catalog. By using other stitching rulers, the failure rate of the automatic stitching may increase. Manual correction may be required then.

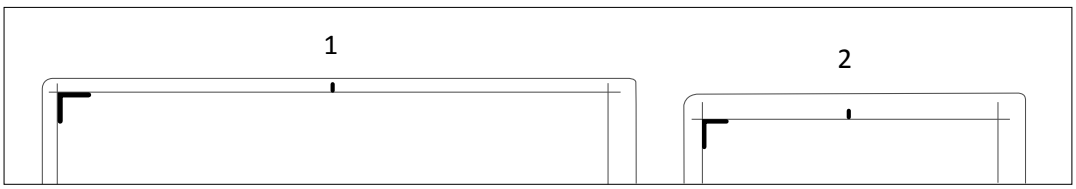
WARNING

Do not use the stitching operations until you have read and understood the instructions and safety messages contained in this section.

Notes on Stitching Exposures with the SkyPlate Detector

NOTICE

- Only the large portable detector can be used for stitching exposures, not the small detector.
- For stitching exposures, the portable detector must be inserted in the Bucky tray.
- Stitching runs can be carried out with the large portable detector in landscape or portrait format, depending on the required lateral and longitudinal coverage.
- Some stitching runs require three exposures, some require only two. This depends on the area covered and also on whether the portable detector is used in landscape or portrait format.
- The exposure time is
  - typ. 12 s for spine exposures (two exposures)
  - typ. 20 s for leg exposures (three exposures).
- As with any exposure on the portable detector, you must ensure that the Top-of-Image indicator is orientated to the patient's head.



Preparation at the Eleva Workspot

► Select the patient and start the examination.

► Select the required stitching view.

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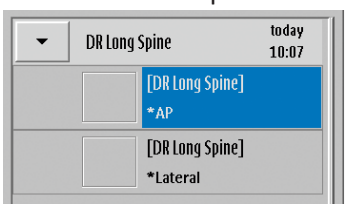
⇨ The collimation opens to the view default. Example:



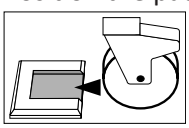
⇨ The Eleva Workspot is now ready.

NOTICE

The maximum coverage is 120 cm (47 in) at the detector plane at an SID of 260 cm (102 in). If no stitching view is selected, the collimation is limited to 43 cm × 43 cm (17 in × 17 in).

Wall Stand Acquisitions

- ► Make sure the detector is at 0°.
- ► Insert the correct grid (f_0= 180 cm) or remove the grid, depending on the application performed and on the patient.
- ► Position the patient support into the metal fasteners.



- ► Lock the front wheels.
- ► Move the ceiling suspension to the programmed SID for stitching (tube assembly must be at 90°).

NOTICE

Make sure that the patient support cannot tip over when the patient gets on or off.

- ► Position the patient on the patient support.
  For examining legs, position the patient standing on the step.
  For examining spines, position the patient standing on the step or fold up the step and position the patient standing on the floor or sitting on a stool.

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NOTICE

Ensure that the patient completely covers the measuring fields, especially in the lateral view. If the measuring fields are not covered throughout the entire acquisition, this causes underexposure. If the measuring fields cannot be covered, for example, due to the extent of the patient's scoliosis, do not use the AEC mode. Change to a manual technique.

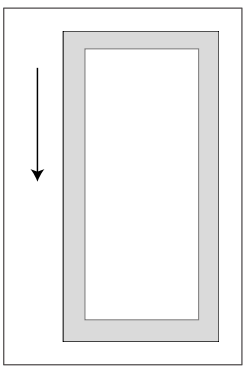
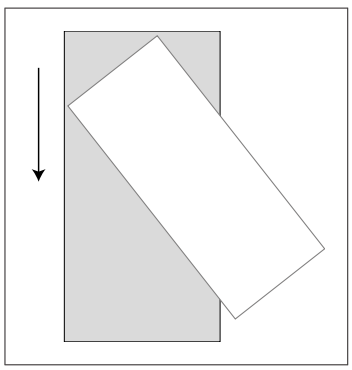
- ► Adjust the patient grips and the straps to secure the patient (if straps are required).
- ► Adjust the tube assembly height so that the light field covers the entire region of interest (C1 to sacrum for spine or ilium to ankle joint for legs).
- ► Collimate if necessary in the X- and Y-axes.

NOTICE

When you change the tube assembly height, the collimation in the Y-axes automatically decreases if the tube assembly height gets too low. The system still shows a green ready light.

WARNING

Ensure that the collimator is not rotated. Otherwise, automatic stitching may fail and manual stitching may not be possible.

Correct collimation	Wrong collimation
	

CAUTION

Always use the smallest possible X-ray field collimation to prevent too much direct radiation onto the detector. Otherwise, so called "ghost images" may appear.

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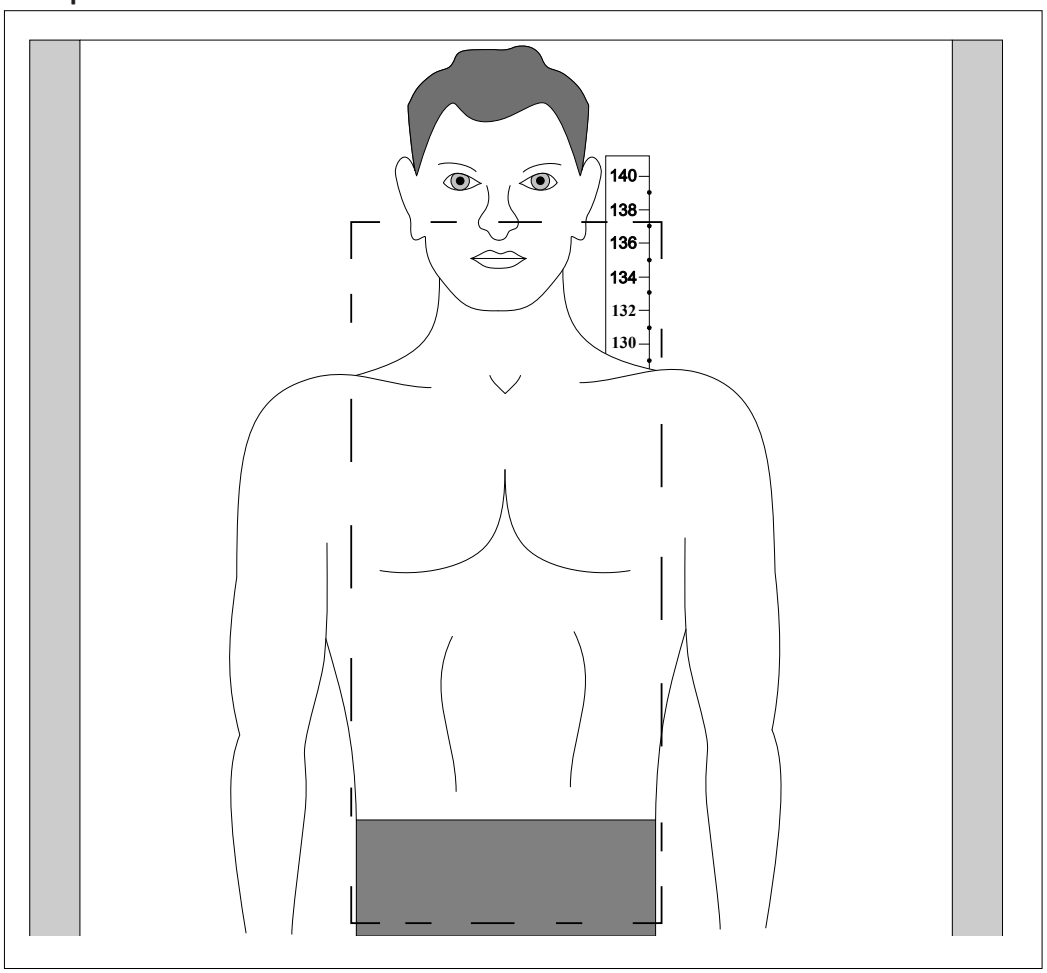
► Adjust the stitching ruler so that it is at least 1 cm within the collimated area. The numbers of the ruler must point inwards. This applies for both AP and PA examinations.

WARNING

- **The stitching ruler must be completely within the collimated area. Otherwise, the failure rate of the automatic stitching may increase.**
- **X-ray absorbing objects (for example, protectors or implants) should not cover the stitching ruler. Otherwise, the failure rate of the automatic stitching may increase.**
- **Ensure that the numbers of the stitching ruler face inwards:**
  - **For AP spine examinations, place the stitching ruler to the left of the patient. Example:**



  - **For PA spine examinations, position the stitching ruler to the right of the patient.**
  - **For left lateral spine examinations, place the stitching ruler anterior to the patient.**
  - **For examinations of one leg, place the stitching ruler to the left of the patient.**
  - **For examinations of both legs, place the stitching ruler in between the legs.**

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WARNING

Risk of Misusage!

- **Do not use the stitching ruler for calibration. The stitching ruler and the anatomy are not on the same plane. Therefore, they have different magnification factors on the detector. This means that absolute values cannot be measured. The values are suited only for orientation. For the calculation of the magnification factor, see the chapter “Image Scaling”.**

  Calibrate each image (including the composite image) by using a calibration object in the plane of interest. After calibration, all measurements are related to the dimensions defined with this calibration.

NOTICE

- The X-ray acquisitions are taken from the head toward the direction of the feet.
- Depending on the collimation, 1 to 3 exposures will be performed, based on the coverage of the field of view. The number of images is displayed on the tube display.

Test Run

CAUTION

Prevent unnecessary radiation

Perform a test run (without radiation) to make sure that no obstacles block the movements of the X-ray system. Otherwise, the exposure may be interrupted, and you may have to retake it.

► During the test run, verify the following:
  - The collimation is accurate and the light field is parallel to the detector movements.
  - No obstacles block the movements of the X-ray system.
  - The stitching ruler is positioned accurately:
    - The stitching ruler must be at least 1 cm within the collimated area.
    - The numbers of the stitching ruler must point inwards.

► Press the following button in the display of the Eleva Tube Head:

⇨ The system performs the test run.

⇨ After the test run, the tube assembly and the detector return to the start position of the stitching run.

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NOTICE

Pressing any button on the tube assembly during the test run aborts the test. You must manually move the tube assembly back to the 0° or 90° position.

Exposure

CAUTION

Prevent unnecessary radiation

Perform a test run (without radiation) to make sure that no obstacles block the movements of the X-ray system. Otherwise, the exposure may be interrupted, and you may have to retake it.

- ► Perform a test run (see the previous section).
- ► Check and modify generator settings, if necessary.

WARNING

For the whole duration of the exposure, the patient must not move.
The exposure time is

- **Typ. 9 s for spine exposures (two exposures)**
- **Typ. 14 s for leg exposures (three exposures).**

CAUTION

Prevent unnecessary radiation

Releasing the exposure button cancels the entire process. Only images taken up to then can be stitched together. The view cannot be stopped and resumed.
Therefore, press and hold the exposure button until the exposure is finished. The X-ray exposure icon disappears and an audible signal occurs.

- ► Press the exposure button and keep it pressed for the whole duration of the stitching run (2 or 3 exposures).
  This controls the system movement and the X-ray release.

⇨ During the exposure, this icon appears and the images appear on the screen.
If you are not happy with an image or if the patient moves during the exposure, you can interrupt the exposure by releasing the exposure button.

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Underexposed Images with Automatic Exposure Control (AEC)

▷ You have selected a stitching view with automatic exposure control (AEC).

► If the system detects an under exposure during the exposure of the single images, a non-confirmable user guidance appears after the affected image.

► Do one of the following:

- To abort the stitching run, release the exposure button.
- To continue the stitching run, keep the exposure button pressed.

► Additionally, a confirmable user guidance appears after the last image.

- To continue the stitching of the images at the Eleva Workspot, confirm the user guidance with **OK**.

Automatic Stitching

When all images for a view have been read out, the system tries to stitch them automatically. For this, the view is closed.

NOTICE

The stitching of the images takes approximately 6 s to 10 s for two and three images respectively, depending upon the area of exposure. The maximum time for the full coverage of 120 cm × 43 cm (47 in × 17 in) is 18 s.

NOTICE

Automatic stitching may fail if the system cannot find enough reference points in the overlap area of the individual images.
If the autostitching fails, a message appears and this icon appears:


.

If this happens, stitch the images manually (see section “Manual Stitching”).

NOTICE

Automatic stitching fails if the patient or the SkyPlate detector have been placed upside down. Then you should rotate the images at the Eleva Workspot (see section “Rotating the Individual Images”).

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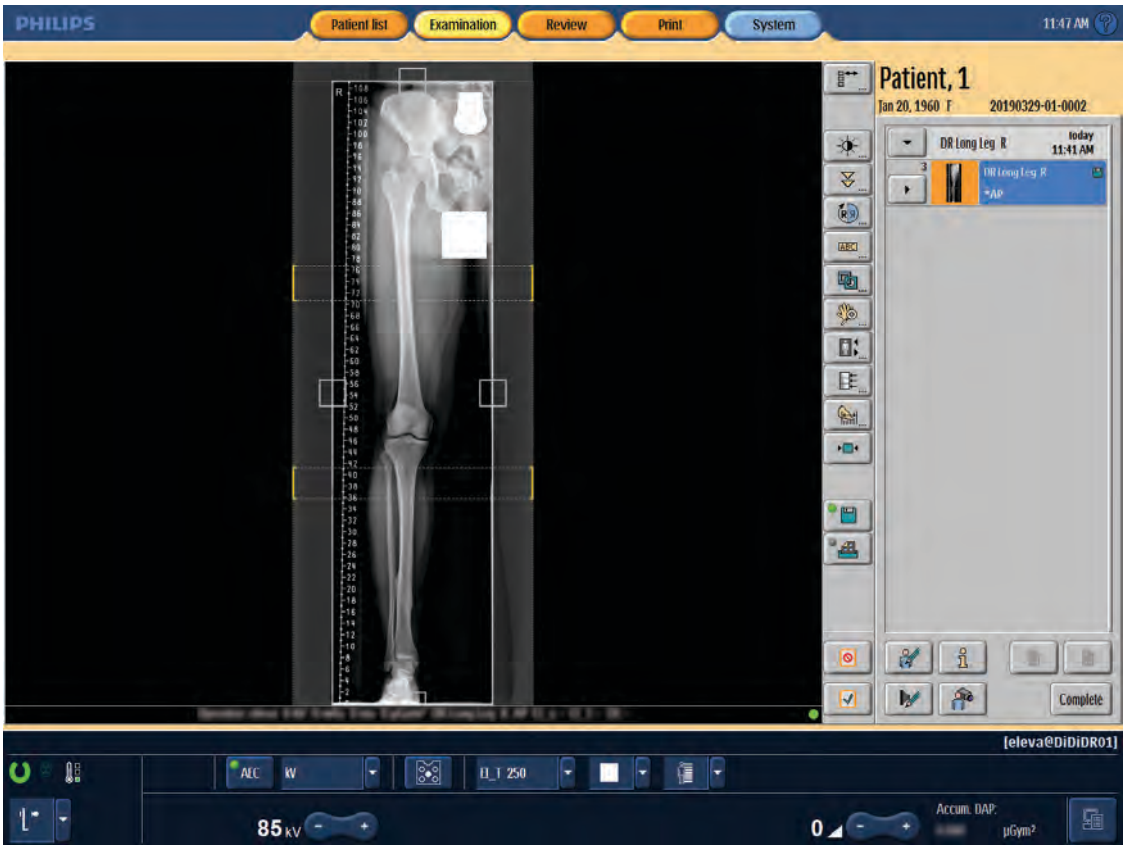
After successful automatic stitching, a new view with the composite image is generated. Example:



NOTICE

You can use the image manipulation tools for the individual images as well as for the stitched image.

WARNING

You must always verify the overlapped area of the stitching ruler and the anatomy. In a few cases, the images are not automatically stitched correctly. As a result you must manually stitch them. Therefore, Philips places lines on the composite image to assist in the visualization of the overlapped areas.

- **Check the overlaps in the stitching tool (see section “Image Analysis”).**
- **Correct if necessary (see section “Manual Stitching”).**
- **Remove the lines if necessary with**

  .

  If you remove the lines, the overlapped areas may not be recognized in the PACS anymore.

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CAUTION

No overlap between stitched images

If the overlap between the images is too small for automatic or manual stitching or if there is no overlap at all, call Service.

NOTICE

No automatic image confirmation

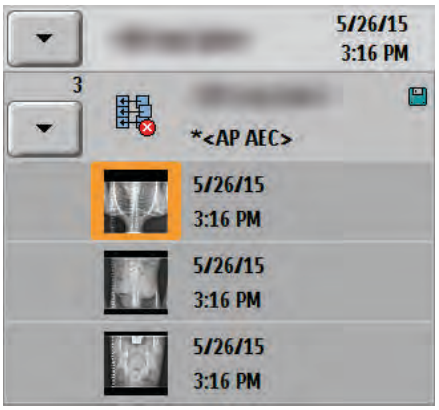
Even if automatic image confirmation is programmed, it is not activated for stitched images. In order to complete the exam, you must confirm or reject each composite image.

Rotating the Individual Images

When the single stitched images are upside down you can rotate them manually.

- ► Select the single image that you want to rotate.

⇨ The selected image is marked with an orange frame.



- ► Click the **Rotation tool**.

- ► Click this to rotate the image 180°.

- ► Click this to confirm and to exit the tool.

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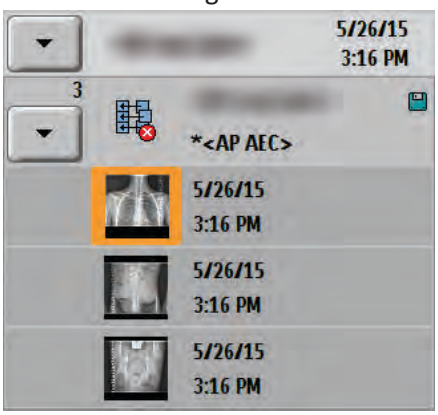
⇨ The selected image is rotated 180°.



► Rotate the other single images as well.

► Click the **Stitching tool**.

► Click this to stitch the images automatically.

If the automatic stitching fails, stitch the images manually (see chapter “Manual Stitching” on page 132).

Manual Stitching

NOTICE

Automatic stitching may fail if the system cannot find enough reference points in the overlap area of the individual images. If this happens, the individual images must be stitched manually.

► Select the original composite image.
The functions for manual stitching are available only when the original composite image is selected.

► Call up the stitching tool.

⇨ The following appears:

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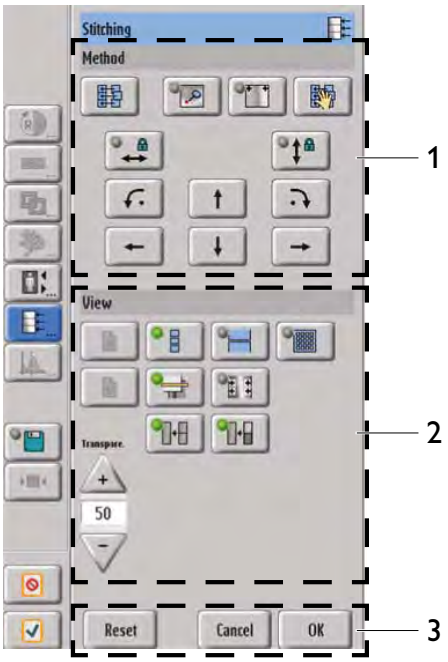

The stitching tool provides two sets of controls. The upper set (“Method”) is for arranging the images to a suitable composite image. The lower set (“View”) helps you to adapt the display of the images on the left hand side for better operation in the view port.

Legend	Button	Meaning
1		Stitch the images automatically.
		Fix two partial images at a point (“pin”). With this, you define the rotation point (only for cassettes).
		Mark the partial images with orientation points.
		Join the partial images using the two orientation points.
		Lock the horizontal movement.
		Lock the vertical movement.
		Rotate the image clockwise around the “pin” (only for cassettes).
		Rotate the image counterclockwise around the “pin” (only for cassettes).
		Move the image upward.
		Move the image to the left.

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Legend	Button	Meaning
		Move the image downward.
		Move the image to the right.
2		Navigate between the overlap areas (only if you have three images).
		
		Show the entire composite during the stitching manipulation.
		Show the overlapped area over the full size of the images.
		Show the overlapped area “pixel to pixel”.
		Mark the overlap.
		Interpolate the gap between both images after they have been stitched together (for administrator only).
		Compensate the gray levels of both images (for the administrator only).
		Enhance the crosses in scatter radiation (only for cassettes).
		Define the transparency in the overlap area between the front and the back image.
3		Reset the images to default position.
		Cancel.
		Confirm the changes and exit the tool.

Basic Workflow for Manual Stitching

- Call up the stitching tool.

- Click this to magnify the overlapped area to full size
  or

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► click this to magnify the overlapped area to “pixel to pixel”.

► Check for shutter failure on the individual images. If there is a visible image transition on the composite, correct the shutter failure as described in chapter “Analyzing the Images”.

► Select and move the middle or lower image directly within the view port or use the arrows for fine adjustments.

NOTICE

When stitching, you always move the bottom image. When you work with three images and “grab” the top cut edge, you always move the bottom two images as a unit.

► If necessary, use the transparency mode to “see through” the images. This helps to align the stitching ruler or the anatomy.

NOTICE

Always align the stitching images along the anatomy, regardless of the stitching ruler. If the patient has breathed or moved during the acquisition, the ruler can be misleading.

► If necessary, remove the overlapped lines.

NOTICE

If you remove the lines, the PACS may not recognize the overlapped areas anymore.

► If necessary, press reset to get the images into default position.

OK

► To confirm the composite image, click OK or leave the tool.

NOTICE

- The individual images are assembled to form a final image. This new image is added to the examination as a new view.
- You can use the image manipulation tools for the individual images as well as for the stitched image.

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Additional Tools

With the marker tool you may place the orientation points at the same characteristic place in both images.

This tool joins the partial images using the two orientation points.

Manual Corrections with the Stitching Tool

- Select the composite image.

- Call up the stitching tool.
- Make all necessary corrections.
- Click **OK** to confirm the corrections.

Workflow for Minor Corrections

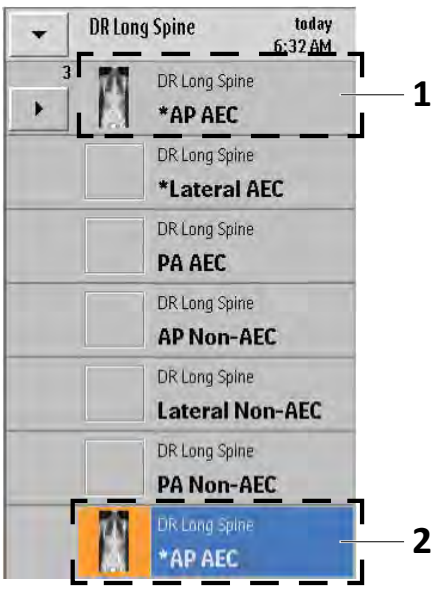
After clicking **OK** the system applies all minor corrections without any further confirmation. A minor correction is, for example, to unmark the overlap.

Workflow for Major Corrections

After clicking **OK** a user guidance asks whether you want to proceed with the stitching of the images. A major correction is, for example, to move the individual images within the composite image.

- Confirm with **Yes** to apply the corrections to the composite image. Click **No** if you want to discard your changes.

⇨ When you confirm with **Yes**, the system saves your changes as a new composite image (2).



- Select the first composite image (1).

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► Click this to reject the image. (The image is not sent to PACS then.)

⇨ A user guidance asks you for confirmation.

► Confirm with **OK**.

⇨ If the function **Ask for reject reason** is activated, a window appears.

► Select the following reject reason:

► Select the new composite image (2).

► Click this to confirm the image. (The image is sent to PACS then.)

Complete

► Click this to complete the examination

NOTICE

For Systems with QA Tool (Optional)

The system documents all rejected images in the QA tool. Select **Stitching re-adjustment** as reject reason to document that the reject reason was a manual correction of the composite and not a retake.

Analyzing the Images

WARNING

Always check the final composite for correct positioning.
The failure rate of the automatic stitching may increase due to incorrect collimation or incorrect exposure.
Always check the following:

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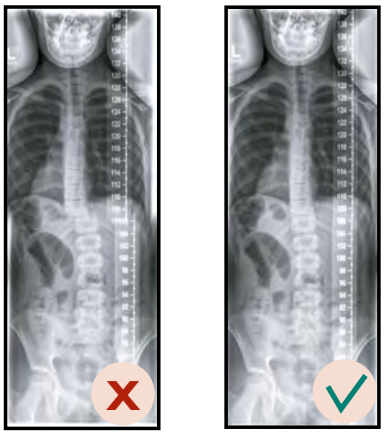
- Check the accuracy of the automatic stitching. Example:



- The stitching ruler must be covered completely by the collimated area.
  The stitching ruler must be at least 1 cm within the collimated area.
  The numbers of the stitching ruler must point inwards.
  The stitching ruler must be parallel to the collimated area and to the detector movement.
  Examples:

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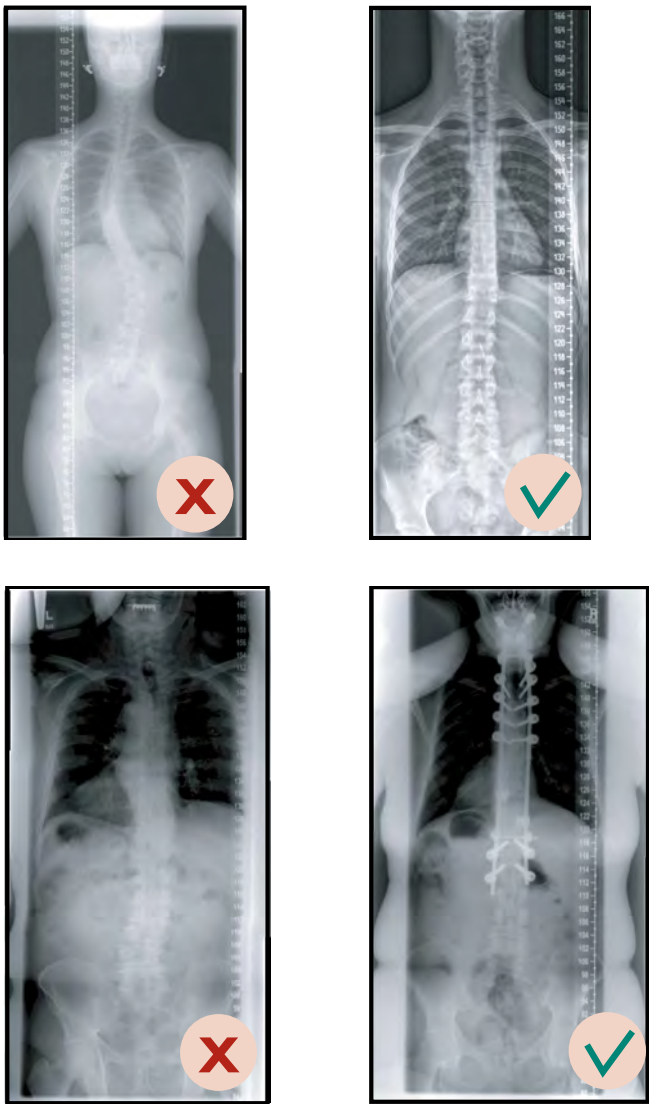

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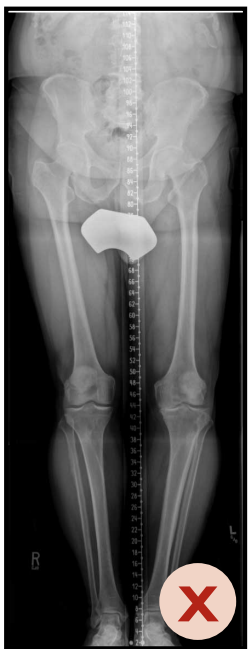
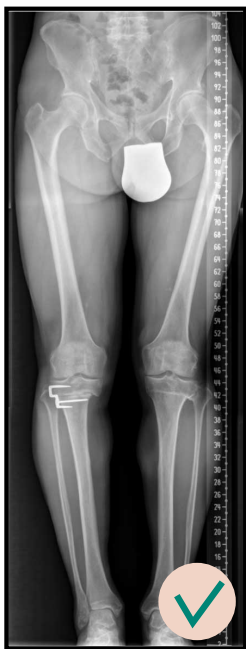
- X-ray absorbing objects (for example, protectors or implants) should not cover the stitching ruler. Example:





- Check the patient positioning over the measuring fields – especially in the lateral view. If the measuring fields are not covered, this may cause underexposure.
- Verify that the image does not have any “ghosting”.
- Ensure a tight collimation to prevent too much direct radiation onto the detector.
- Always check the overlap. If the patient has breathed or moved during the acquisition, this may result in a horizontal displacement of the patient. In this case, you may have to re-stitch the images manually. Always align the anatomy, even if the stitching ruler is displaced.
- Check for shutter failure on the individual images. Examples:

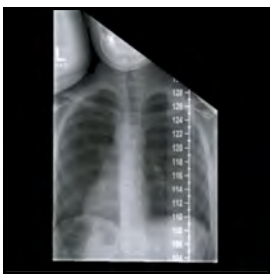


Fig. 11: Shutter in the anatomy

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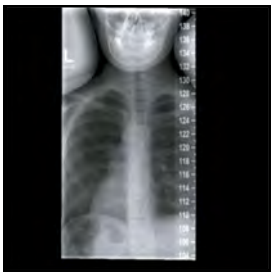

Fig. 12: Shutter on the stitching ruler

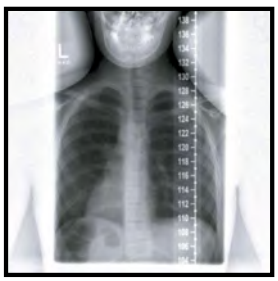

Fig. 13: Shutter not found

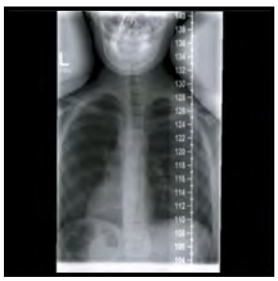

Fig. 14: Shutter partially not found

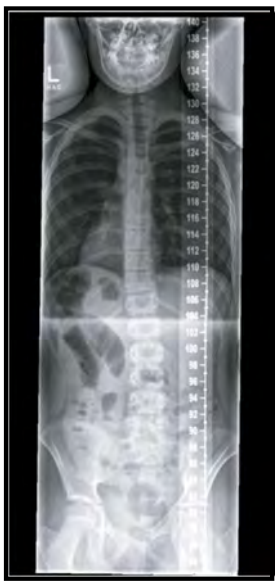

Fig. 15: Image transition caused by partial shutter failure

If there is a visible image transition or a shutter failure on the composite, correct the shutter failure as follows:

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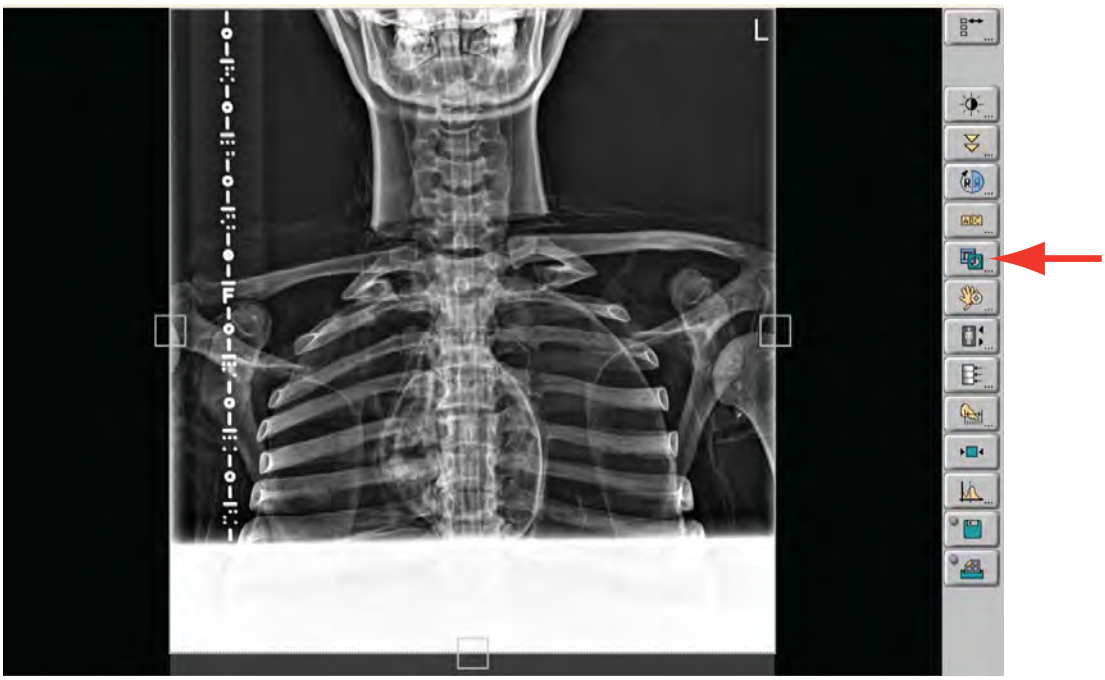
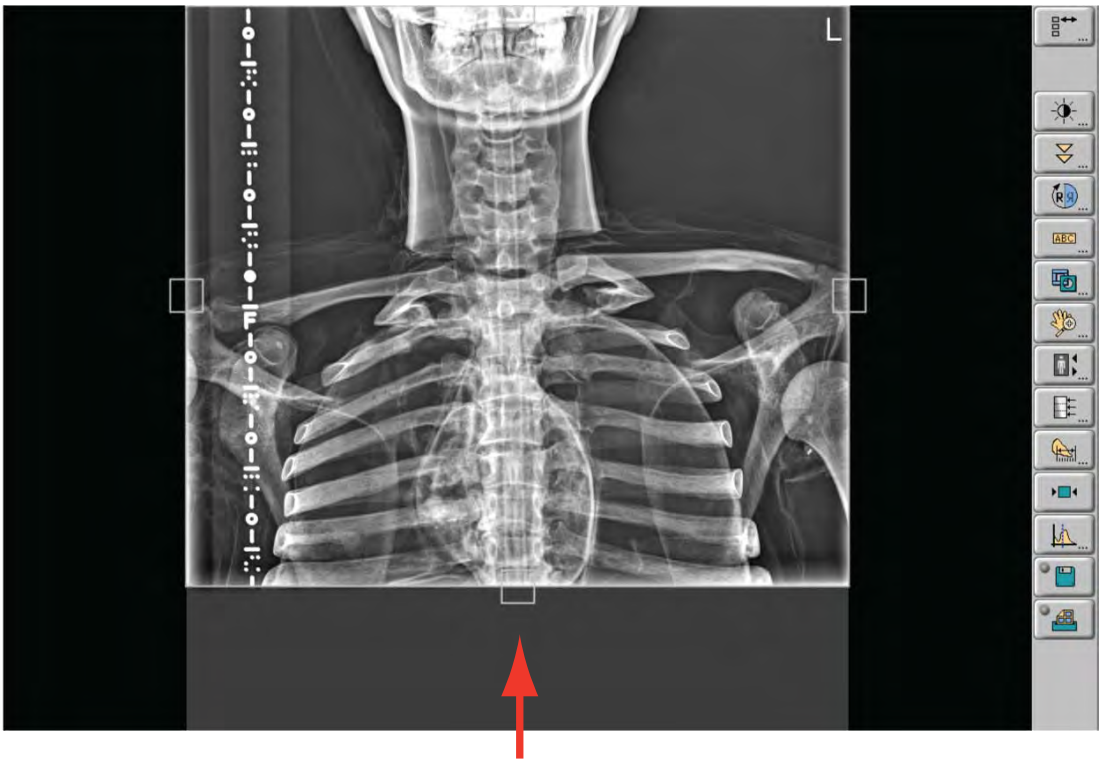
- Select the shutter tool.



- Move the adjustment handle to the desired position.



- Confirm with **OK**.

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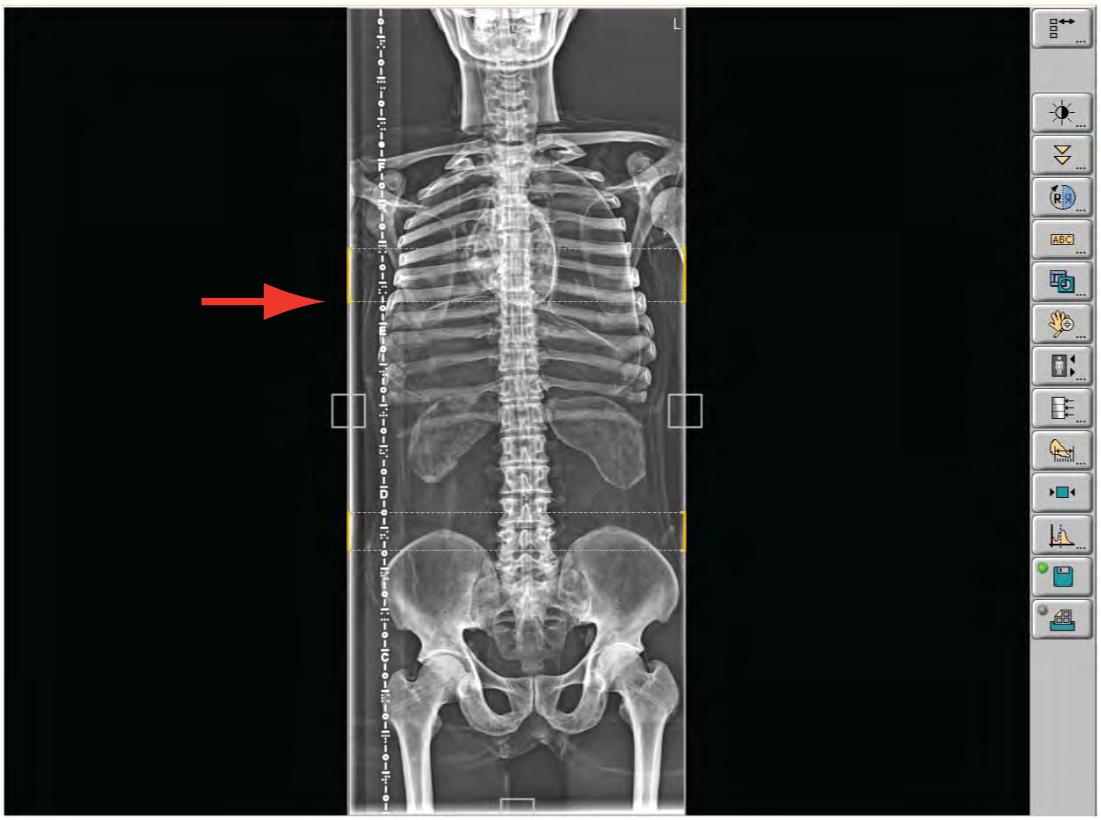
⇨ You have corrected the shutter failure.



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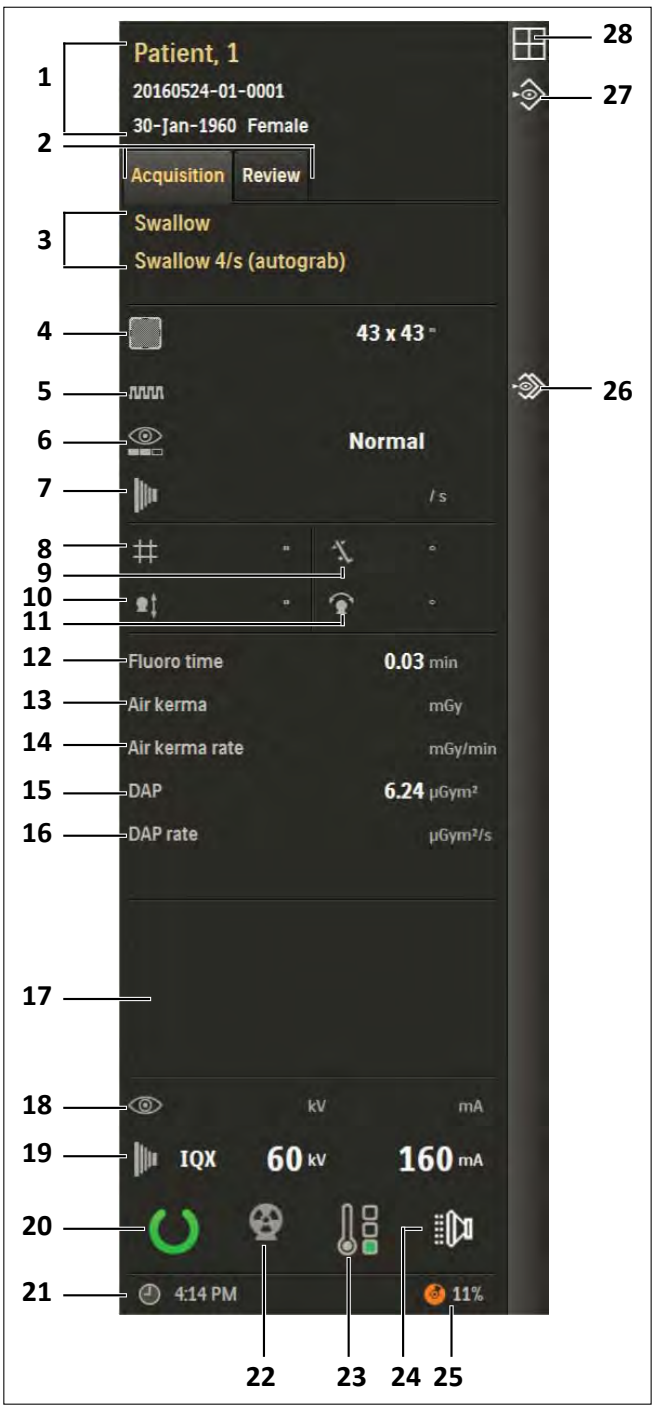
Fluoroscopy

Acquisition on RF Viewer



No.	Meaning
1	Information on the selected patient.
2	Select **Acquisition** or **Review**
Displayed Information	
3	Examination and view name
4	Selected detector field size
5	Selected fluoroscopy speed
6	Selected fluoroscopy flavor
7	Selected exposure frame rate
8	Collimation size
9	Table tilting
10	SID
11	Column angulation
12	Fluoroscopy time
13	Air kerma
14	Air-kerma rate (only during image acquisition)
15	Dose area product (DAP)
16	Dose-area-product rate (only during image acquisition)
17	User messages
18	Fluoroscopy settings: kV and mAs
19	Exposure setting: kV and mA/mAs
20	“Ready for exposure”
21	System time
22	Radiation ON
23	X-ray tube assembly temperature
24	Selected registration device
25	Free memory

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	No.	Meaning
	26	Appears when dynamic fluoroscopy grab (auto grab) active
	27	Appears when the grabbed image is saved.
	28	Appears with the last image hold

Fluoroscopy Modes

Setting the Fluoroscopy Frame Speed

	Meaning	Recommended Use
	Pulsed fluoroscopy, slow	Large dose savings, for slow movement and/or for examinations of a relatively long duration, for example, stomach, small intestine, myelogram, venogram, arthrogram examinations
	Pulsed fluoroscopy, medium	Medium dose savings, for less dynamic examinations
	Pulsed fluoroscopy, fast	Small dose savings, for dynamic examinations (rapid movement), for example, swallow examinations
	Continuous fluoroscopy	For dynamic examinations (rapid movement), for example, swallow examinations

NOTICE

The frame speed and dose levels depends on the fluoroscopy flavor, the application, and the patient thickness setting. These settings can be individually adjusted by customer service.

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Setting Fluoroscopy Flavor

	Meaning	Recommended Use
	Reduced dose	When an additional reduction of dose is desired and a corresponding decrease in image quality is diagnostically acceptable.
	Normal	For normal fluoroscopy flavor.
	High quality	To decrease image noise, for example, for improved recognition of catheters or if grabbed fluoroscopy images are intended to replace spot images.

For reference air kerma values, see section “Radiation Dose Management” in the Instructions for Use CombiDiagnost R90.

Grid Controlled Fluoroscopy (Optional)

Grid controlled fluoroscopy (GCF) is an option that improved image quality while simultaneously reducing radiation dose. GCF allows you to choose among three preselected frame speeds. The frame speeds and dose levels depend on the fluoroscopy flavor, the application and the patient thickness setting. These settings can be individually adjusted by customer service. High frequency with small dose saving is generally used for dynamic studies and low frequency with large dose saving is generally used for less dynamic studies.

For some examinations with a need for high penetration, the high quality flavor can be set to a high dose mode. In this mode, the typical entrance dose rate limits can be exceeded.
When high dose is selected, fluoroscopy is accompanied by a special high dose sound. Dependent on the settings, high dose is switched back to normal when a certain fluoroscopy time is exceeded.

NOTICE

The doses for the high dose fluoroscopy flavor can be set in the EPX database according to your needs. Contact customer services. Make sure that the maximum doses set, comply with the national standards.

Exposure Frame Rate

The exposure frame rate selection is dependent on the selected detector format and exposure settings based on the application and the patient thickness setting. It is in relation to the exposure time (ms) and the resolution needed. These settings can be individually adjusted by customer service.

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Detector Field Size (Zoom Level)

	Detector Field Size
	43 cm x 43 cm (17 in x 17 in)
	30 cm x 30 cm (11.8 in x 11.8 in)
	20 cm x 20 cm (7.9 in x 7.9 in)
	15 cm x 15 cm (5.9 in x 5.9 in)

Select a larger format for larger objects.
Select a smaller format when a higher resolution is required during series exposures or fluoroscopy.

Other Settings

	Meaning	Recommended Use
	Auto grab	To save every fluoroscopy image. Customer service can program auto grab to be active according to the examination that is selected.
	kV/mA lock	To retain current kV and mA values, even if the object thickness changes.
	Fluoroscopy buzzer	When fluoroscopy lasts more than 5 minutes, an audible signal occurs. If you do not switch off the signal, fluoroscopy will be switched off automatically after another 5 minutes. Also, after another 5 minutes of fluoroscopy the buzzer will sound again.

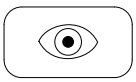
Fluoroscopy Examination

▷ Assuming you have selected a patient and you are in the Examination section:

► Select the appropriate registration device.

► Verify the parameters on the generator area.

► Verify the parameters on the control console.



► For fluoroscopy: Press fluoroscopy pedal on the foot switch.

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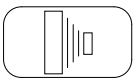
⇨ You can view live images on the monitor.

⇨ You can save images with the grab and auto grab button on the control console.

► For spot exposures: Select single spot exposure or series spot exposure.



► Press the spot exposure pedal on the foot switch.
Or

► Press the hand switch down completely.

⇨ All spot exposures are automatically saved.

► Go to the Review section.

► Verify the image post processing.

► Flag images, if needed.

► Export RF images.

► Complete the examination.

Parallel Stitching (Optional)

General Safety

WARNING

Do not use the parallel stitching functions until you have read and understood the instructions and safety messages.

Workflow

▷ A stitching examination is selected.

▷ The table is in horizontal position.

► Position the patient on the table.

► If you have positioned the patient with the head at the foot end of the table, make sure that the patient orientation “Head at foot end” is selected.

► If necessary, tilt the table to any angle.

► For stitching examination in standing position, tilt the table into vertical position (±90°).

► Adjust the X-ray tube assembly to an SID of approximately 150 cm (59.1 in).

► Place the stitching ruler on the table. Use the stitching ruler only for examinations of legs.

► Check whether the **Fluoroscopy and spot images** registration device is selected.

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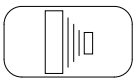
- ► Define the starting point of the stitching run by using the X-ray light field.

- ► Collimate the width. The height of the stitching part image is set by default.
- ► The stitching ruler must be at least 1 cm within the collimated area.



- ► Press the left pedal of the foot switch.

  Or

- ► Press the hand switch down completely.

- ► To end the stitching run, release the pedal of the foot switch.

  Or

- ► Release the hand switch.

NOTICE

You can perform stitching only within a defined range. When the possible stitching range is reached, the stitching run is stopped automatically.

- ⇨ The area scan and the composite image are shown on the RF viewer.
- ► At the end of the examination, move the table back into horizontal position.

WARNING

Do not use the images if artifacts are visible in the composite image due to strong patient movement. Patient movements are visible as image distortions of the anatomy or the ruler if used.

Examining Legs

As the table can be tilted in both directions (±90°), the table is equipped with two markers on both ends of the table. These markers show the lowest mounting position of the footrest to cover the patient's anatomy completely during a run.

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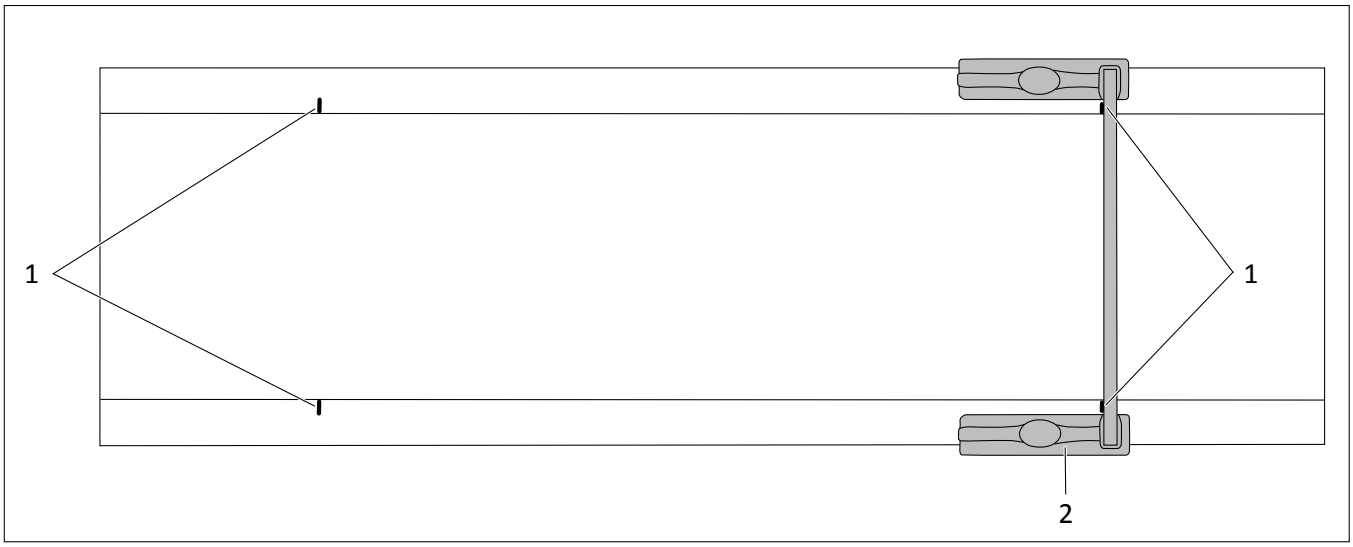


- ► For examining legs, place the footrest (2) so that the upper surface is in line with the lower edge of both markers (1). The markers must still be visible.
- ► Make sure that the footrest securely locks into place.

Manual Corrections on the Composite Image

You find further information on how to modify, delete or create a composite image in the Review and Image Manipulation section.

Digital Subtraction Angiography (Optional)

General

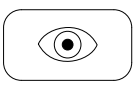
Subtraction assists you to orientate yourself in the anatomy when reviewing fluoroscopy runs. Subtraction visualizes blood vessels in soft tissue by removing details that do not relate to the contrast-filled vessels.

Creating a Roadmap for Fluoroscopy

You can produce a vessel map to use with live fluoroscopy.

- ▷ An examination that is suitable for subtraction is selected.

- ▷ Make sure that **Roadmap** in the **Exposure presettings** menu is selected.



- ► Press and hold the right pedal of the foot switch.
  The following phases are carried out:
  - ⇨ Pre-stabilization phase

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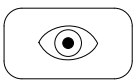
⇨ Tracing phase
During this phase injected contrast agent is traced.

► Release the pedal of the foot switch to end the fluoroscopy run.

⇨ The trace image is completed.

⇨ A mask has been created.



► For orientation, for example, when placing a catheter, perform a fluoroscopy run. The generated mask is automatically subtracted from the live fluoroscopy images.

The mask remains, when you switch **Roadmap** on or off.

Creating a New Mask

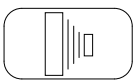
If required, you can create a new mask:

► Select **Create new mask** in the **Exposure presettings** menu.

⇨ A new mask will be created in the next sequence.

Using Subtraction for Spot Images

▻ Make sure that **Image subtract** in the **Exposure presettings** menu is selected.



► Press and hold the left pedal of the foot switch.
Or

► Press the hand switch down completely.

► The exposure series has started.

⇨ During the series a mask image is subtracted from all images.

► Release the hand switch or the pedal of the foot switch as soon as your desired images have been captured.

Manual Corrections on the Subtracted Images

You find further information on how to change the subtraction mask, how to use landmarking, and how to perform pixel shift, in the Review and Image Manipulation section.

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Pediatric Examinations

General

The following instructions especially apply for fluoroscopy and radiography examinations of pediatric patients.
The system provides special pediatric programs in the generator area.

Pediatric Patient Types

There are three special patient type settings for pediatric patients: “Newborn”, “Baby”, and “Child”.

As a high-level guideline see the following table:

Patient Type	Age of the Patient	Height of the Patient[1]	Weight of the Patient[1]
“Child”	24–72 months*	89 cm – 122 cm (35 in – 48 in)	13 kg – 25 kg (28.7 lb – 55.2 lb)
“Baby”	6–24 months*	65.5 cm – 92.5 cm (25.8 in – 36.4 in)	8.3 kg – 14.6 kg (18.3 lb – 32.2 lb)
“Newborn”	0–6 months*	up to 72.5 cm (up to 28.5 in)	up to 9.2 kg (up to 20.3 lb)

* These values can be programmed according to your needs.

[1] The used pediatric patient grouping is based on typical patient type ranges using the maximum range from all stated guidelines for each pediatric patient group.

- Within the 10th and 90th percentile for weight and height of US and German children populations, following, amongst others, the guidelines of the *National Center for Health Statistics/National Center for Chronic Disease Prevention and Health Promotion*.
- Within the 15th and 85th percentile for weight and height following *WHO’s Child Growth Standard*.

Selecting the Patient at the Eleva Workspot

► Select the patient.

⇨ The patient type setting corresponding to the patient age is automatically set in the generator area.

Fig. 16: Example: The pediatric patient is 12 months old. The patient type setting “Baby” is automatically set.

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NOTICE

The three patient type settings for pediatric patients are automatically set according to the age of the patient. For patients older than 72 months, the patient type setting “Normal” is automatically set.
For mainly pediatric examinations, customer service can set the “small” patient type as default.

► Verify the patient type.

You can, at any time, select a different patient type setting (see the following figure).

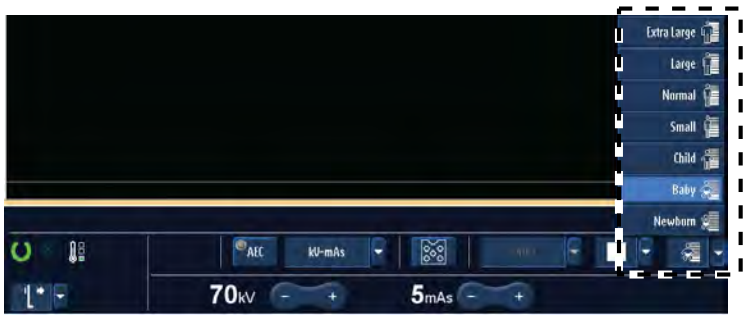

Fig. 17: Selecting a patient type setting manually

The corresponding exposure data (for example kV and mAs) are displayed in the generator area (see the following figure). You can manually change these exposure data.

Fig. 18: Exposure data (kV, mAs) in the generator area (example)

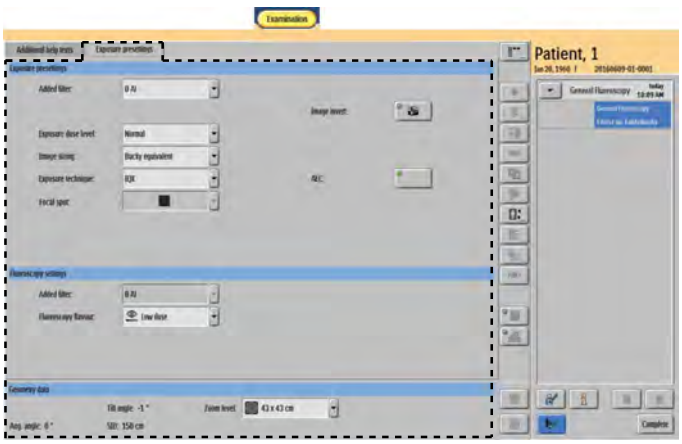

Fig. 19: Parameter setting screen for fluoroscopy (example)

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NOTICE

You can adapt the provided views to the clinical protocols used at your site. Contact customer service for support, if needed.

General Checks

At the Eleva Workspot

- Check that the correct patient is selected.
- Check that the correct view is selected, for example, “AP Chest” or “Barium Swallow”.
- Check that the correct patient type is selected. The patient type depends on the physiology of the child. For example, a baby requires the use of the patient type “Baby”.
- Check that the correct registration device is selected.
- Check that the correct filter (for example, 1 mm Al + 0.1 mm Cu) is set in the parameter setting screen.

NOTICE

Additional filtration in the X-ray beam removes the low-energy part of the X-ray tube spectrum. Without the additional filtration, the entire low-energy part would be absorbed in the patient and would therefore increase the effective dose without contributing to image quality. For pediatric radiography, additional filters of 1 mm Al plus 0.1 mm copper or 0.2 mm copper are recommended. This is common practice in many countries and it is, for example, recommended in the European Guidelines on quality criteria for diagnostic radiographic images in pediatrics.

- Check if a grid is necessary for the examination.
  In the following example a grid is inserted, but not programmed for this view.

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NOTICE

Anti-scatter grids are generally used when the level of scattered radiation is high enough to deteriorate the image quality in terms of contrast and signal-to-noise ratio. The level of scatter depends mainly on the volume being irradiated during the exposure. Pediatric patients vary considerably in size depending on age and individual build. For younger children and generally for the distal extremities, the use of anti-scatter grids is ill-advised. For adolescent and overweight pediatric patients, such a grid may be necessary. The grid can be easily moved in out out of the X-ray field.

Checks at the Geometry

- ► Check that the correct SID is set.
- ► Check that the radiation field is collimated to the necessary minimum.

Radiography

To improve image quality, special attention was given to pediatric extremities on digital X-ray systems. It was found that for pediatric extremities the tube voltage should be as low as possible.

You should use

- 40 kV
- No pre-filtration
- No grid.
- If no portable detector is available or applicable, the utilized registration device should be the vertical stand.

The system database contains generator settings for newborn, baby and child patient type based on 50 kV. Optimized image quality with respect to maximum Contrast-to-Noise Ratio (CNR) at a given constant patient dose is achieved at generator settings based on 40 kV. An application CD delivered with the system contains the pediatric extremities EPX database with the generator settings for pediatric extremities based on 40 kV. For further information or to activate these settings, contact your application specialist.

Installing the pediatric extremities EPX database (based on 40 kV) to the system should always be in reconciliation with the customer. Each generator setting provided by Philips is a recommendation.

For an overview of typical patient entry doses for examinations of pediatric extremities, see “Radiation Dose Management”. For further information, refer to the Philips Application Guide “Pediatric Extremities”.

After Exposure

- ► Confirm the following:
  - The image is acceptable in terms of image quality and positioning.

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- The exposure index EI_s and the deviation index (DI) are in the recommended range. The deviation index is visualized by a color indicator (green/yellow/red).

For more information on the exposure index, refer to the section “Exposure Index”.

Fluoroscopy

When one of the three pediatric patient types is selected, the system selects automatically dedicated pediatric fluoroscopy curves for continuous fluoroscopy and GCF. In addition, filters of 1 mm Al + 0.1 mm Cu are automatically selected.

NOTICE

Pediatric dose rate regulation curves use lower mA compared to adult fluoroscopy curves. The goal is to keep the kV as close as possible to 70 kV or higher even for the smallest infant at significantly reduced average mA. This results in considerable dose savings especially for small patients.

► Keep the fluoroscopy time as short as possible.

The system also provides three different fluoroscopy frame speeds: “Fast”, “Medium” and “Slow”.

► Always select the lowest appropriate frame speed for fluoroscopy.

NOTICE

The GCF pulse rate can be adjusted from 0.5 pulses per second up to 30 pulses per second. Many pediatric radiologists are comfortable using per default 2 pulses per second. In-pulse control automatically adapts the brightness of each pulse even at lowest frame rates.

The system provides up to three different fluoroscopy flavors: “Low dose”, “Normal” and “High quality”.

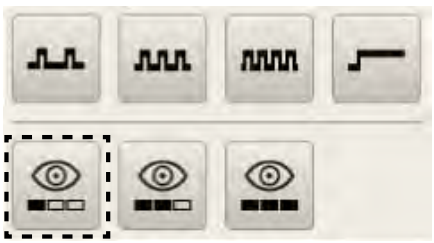

Fig. 20: Fluoroscopy Frame Speed and Fluoroscopy Flavor

► Select the “Low dose” mode, whenever possible. When the images become too noisy for a certain examination, you can at any time increase the dose level to “Normal” or “High quality” if needed.

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NOTICE

The lower the detector dose, the higher the level of quantum noise in the image. Philips sets up the system such that for every taste and examination a dose level can be selected that provides reasonable image quality at the lowest dose according to the ALARA principle (As Low As Reasonably Achievable).

NOTICE

The default fluoroscopy frame speed and the dose level can be adapted to the clinical protocols used at your site. This can differ per examination type. Contact customer service for support.

- Select the largest zoom whenever possible.

- Collimate as small as possible.

NOTICE

Collimate to the area of interest as tight as possible to protect the patient from unnecessary radiation, for example, on the gonads or the long bones. A smaller field size provides better image sharpness and allows the user to visualize smaller details.

Due to the function Automatic measuring fields (AMF), the collimator can be closed to a minimum opening without an increase in image brightness and dose. The system automatically takes the shutters into account and adapts the dose measuring fields such that image brightness and dose remain stable.

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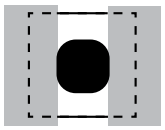
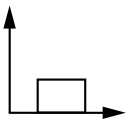
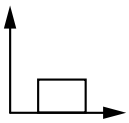
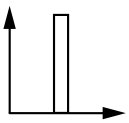
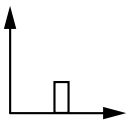
Measuring Field Adaptation	Without AMF	With AMF
		
		
Black area: measuring field	X-axis: measuring field area	
White area: imaging area	Y-axis: radiation intensity	
Gray area: shutters		

- ► Always position the patient correctly relative to detector and the X-ray tube assembly.
- ► If appropriate, use the function “Grab fluoroscopy image” to store images and document findings.

NOTICE

The function “Grab fluoroscopy image” stores the images at no extra dose. Stored fluoroscopy images appear noisier than exposures. However, if this level of image quality is adequate, you can avoid digital exposures with their relatively high dose. The function “Grab fluoroscopy image” stores the images without time delay. This is especially useful for documenting fast dynamic processes or for examinations with children that cannot cooperate.

Quality Control

NOTICE

The following aspects refer to the quality of radiographic imaging in general. However, they are especially important for pediatric work, because of the fine detail to be imaged and the need to apply doses as low as reasonably achievable.

- ► To achieve the optimal image quality, confirm the following
  - The detector has been properly calibrated in the recommended time range.
  - The correct view and therefore the correct image processing is used.
  - The correct patient type is used.
  - If necessary: the correct filter and grid are used.
  - The correct SID is used.

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- The collimated field of view is as small as possible for the anatomical region to be imaged.
- The EI_T is in the recommended range (for radiography only).

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10 Review and Image Manipulation

Review Section

Here you have easy direct access to all the images in the image memory for the selected patient. As in the examination section, the Review section offers advanced image manipulation tools for checking image quality and for exporting images to an archive.

For radiography images, use the Eleva Workspot. For fluoroscopy and spot images, use the RF Viewer.

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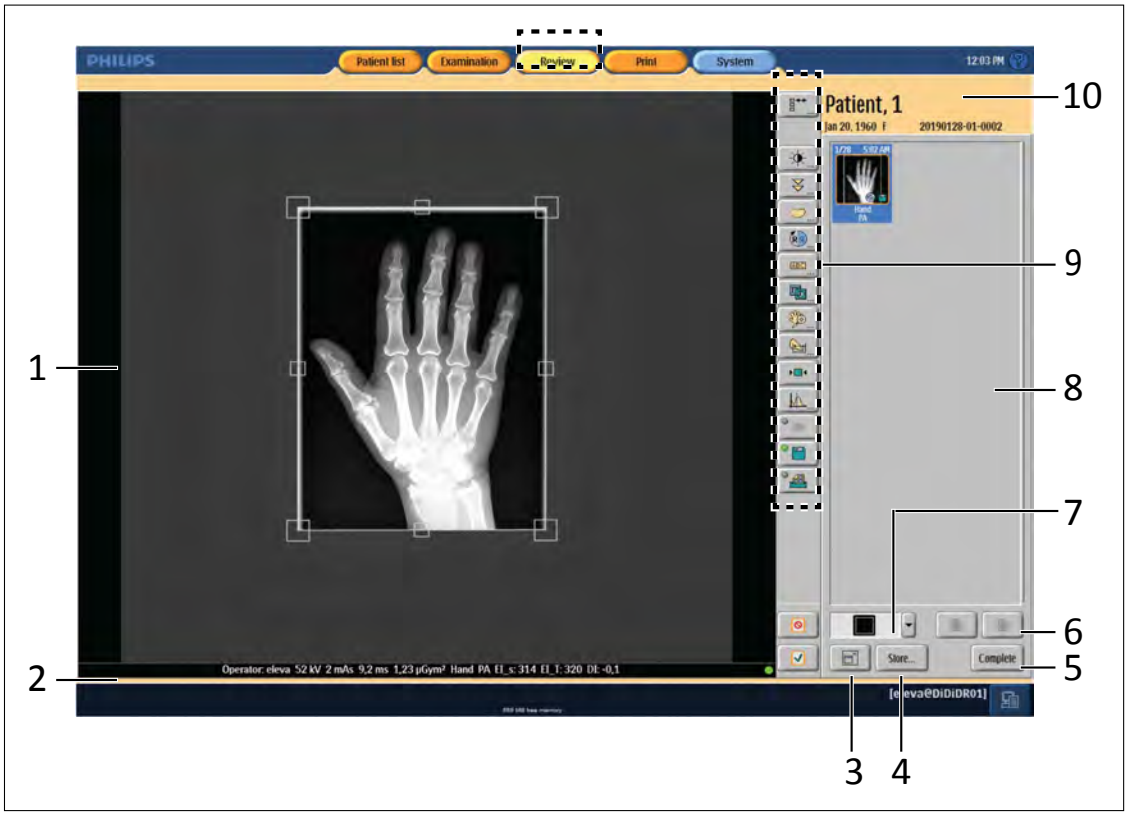
Overview Review on Eleva Workspot



No.	Meaning
1	Display of the selected image/view
2	Exposure and examination information
3	Display selected image at full screen
4	Store selected images in an archive
5	Complete all views and types of examination
6	Scroll through the image memory
7	Select a viewport. You can display up to four images at the same time.
8	Image memory; contains all the acquired images of the patient
9	Tools for image manipulation
10	Information on the selected patient

You use the image manipulation tools when you have already made images and want to modify them.

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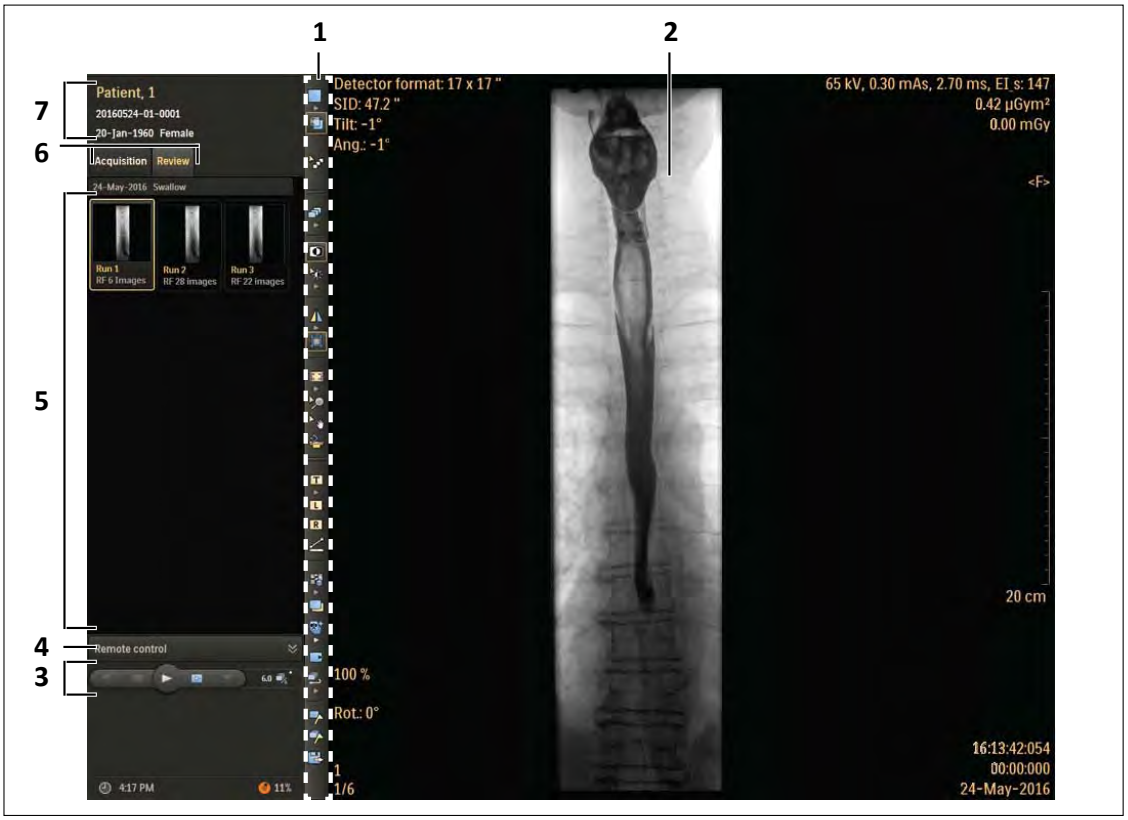
Overview Review on RF Viewer



No.	Meaning
1	Tools for image manipulation on RF Viewer
2	Display of the selected fluoroscopy images and spot exposures Display of exposure data
3	Navigation bar
4	Display functions when the remote control is used
5	Display of all saved fluoroscopy images and spot exposures
6	Select **Acquisition** or **Review**
7	Information on the selected patient

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Radiography

Display Image at Full Screen

- Click this.

⇨ The image is displayed at full screen.

⇨ At the right side of the screen all tools for scaling and contrast/brightness appear (see chapter “Scaling” on page 179 and chapter “Setting Contrast and Brightness” on page 178).

- Toggle between the scaling tools and the contrast/brightness tools.

- Return to normal view.

NOTICE

When you close the full screen tool, the changes to the image will not be saved.

Selecting a View Area Layout

- Click the arrow and change the view area layout as required.

Placing an Image in a Viewport

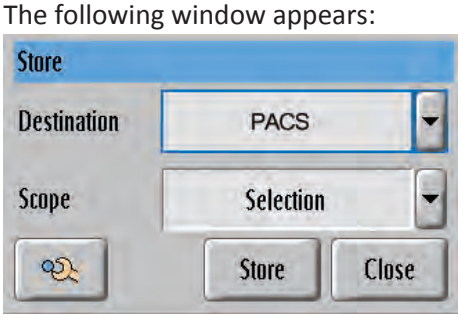
All images of an examination appear in the image memory.

- Click an image in the image memory.
- Click the desired field of the viewport.

⇨ If the viewport is empty, the image is placed there.
If there is already an image in the viewport, it is replaced by the new one.

Exporting Images to an External DICOM Destination

The following window appears:



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Button/Text	Meaning
Destination	Export destination – All configured DICOM nodes
Scope	Scope of the images to be exported: – All – Selection
	Save selected images for Service in “service area.” If required, you can also save the raw image with it.
	Export now.
	Close export function.

Image Manipulation Tools

The functioning of each tool is explained in the following sections.

Symbol	Meaning
	Access all image manipulation tools, also those not configured in the normal toolbar.
	Annotating an image
	Rotating and flipping an image
	Shutter function
	Simple Ranger Tool
	Setting contrast and brightness
	Scaling
	Image calibration and measurements
	Moving images between examinations (only available in the **Examination** section)
	Resetting an image

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Symbol	Meaning
	Stitching (only available in the **Examination** section)
	Setting image processing protocols
	Setting image processing parameters and Advanced Ranger Tool

You can customize the toolbar to your requirements.

Individual Image Manipulation Tools

Calling Up the Image Manipulation Tools

Depending on the configuration, this function may be available to the administrator only.

- Call up all image manipulation tools.

- Select the tool to use.
- Press **Customize** to add the tool to your toolbar.

Annotating an Image

Here you can find the following tools:

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Button	Meaning
	Position L
	Position R
Enter free text	Enter text. The text appears in the center of the image while typing. Or Click the predefined text. The text appears in the center of the image. You can move the text anywhere in the image using the mouse. (The administrator can predefine texts.)
Font size	Change the font size
	Remove the selected annotation
	Delete all annotations
	Write all image processing parameters on image (for the administrator only).
	For customer service only.

You can select and move existing annotations without opening the tool.

Rotating and Flipping an Image

NOTICE

For fine detail image information it is recommended to keep the image in the original orientation or to use 90-degree or 180-degree rotation.

Image information of relevance to diagnosis may be suppressed or mis-represented when you rotate the image with the following tools:
 .

Here you can find the following tools:

Button/display	Meaning
	Exit tool (accept changes).
	Rotation angle
	Rotate image 90° clockwise.
	Rotate image 90° counterclockwise.
	Rotate image 180°.
	Rotate image 0.5° clockwise.
	Rotate image 0.5° counterclockwise.
	Set two orientation points and rotate image so that they are vertically adjusted. The first orientation point will be on top after rotation.
	Flip image on the vertical axis. This warning symbol appears in the bottom line: 
	Reset changes to original state.
	Cancel changes and exit tool.

► Confirm or reset the changes using the function buttons.

Shutter Function

Polygonal and Rectangular Shutter

There are adjustment handles for polygonal shutter and for rectangular shutter:

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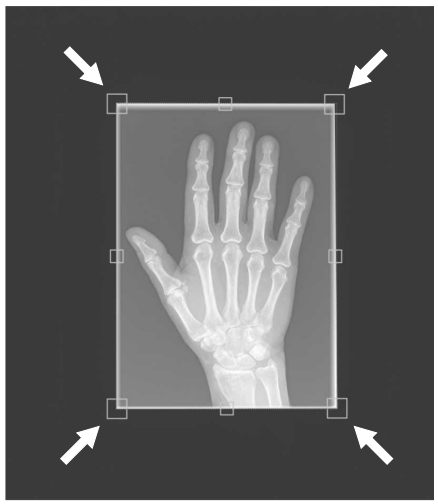
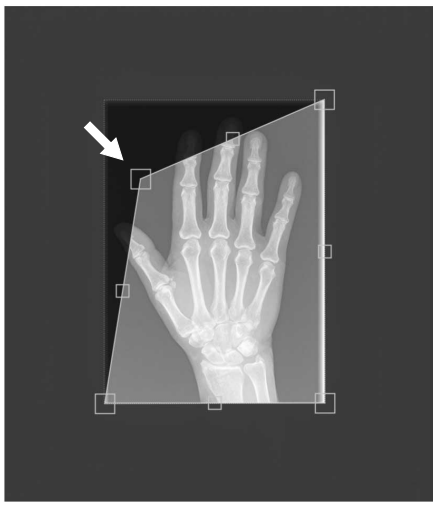
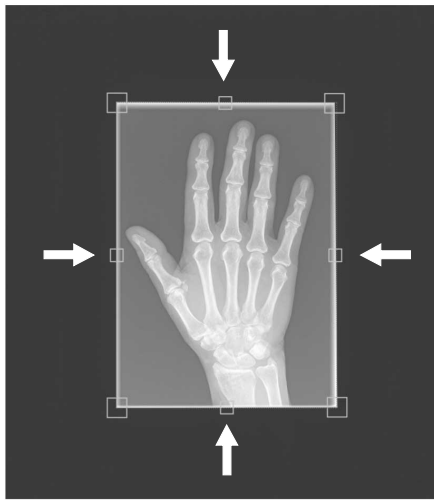
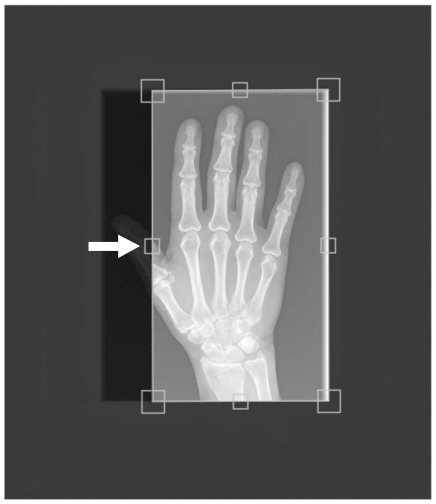
Polygonal shutter		
Rectangular shutter		

Changing the Shutter Directly

In the **Examination** and **Review** section you can change the shutter directly (without opening the tool).

There are three ways to change the shutter:

1. Using the adjustment handles
2. Using the cursor
3. Using the boundary lines

1. Using the Adjustment Handles

► Move the adjustment handle to the desired position.

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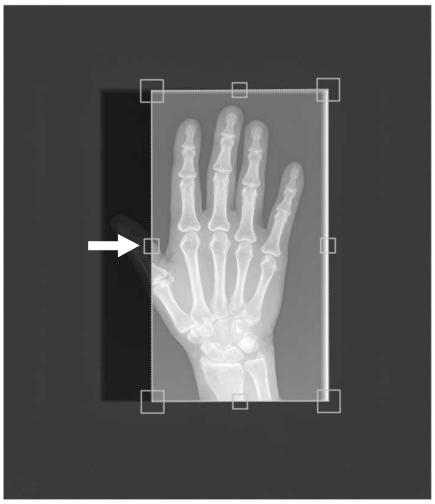

2. Using the Cursor

- ► Move the cursor towards an adjustment handle or a boundary line.

⇨ The cursor shows the following symbol:

- ► Move the adjustment handle or boundary line to the desired position.

3. Using the Boundary Lines

- ► Click the boundary line that you want to move.

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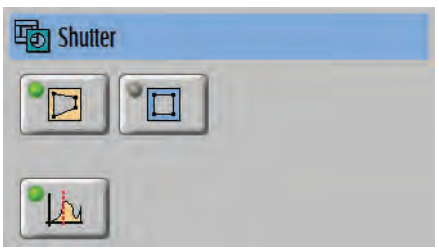
⇨ The boundary line appears red.

► Drag the boundary line to the desired position or click the desired position.

Using the Shutter Tool

Click this to open the shutter tool.



You can change the following:

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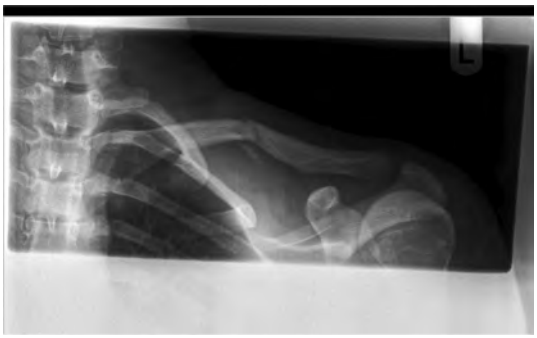
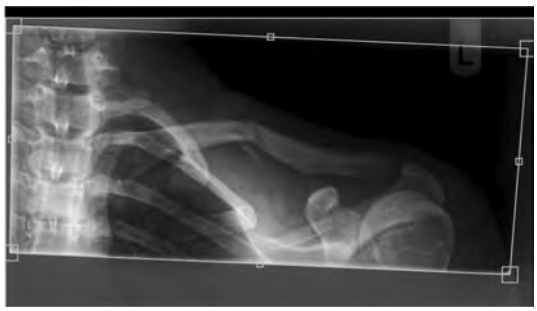
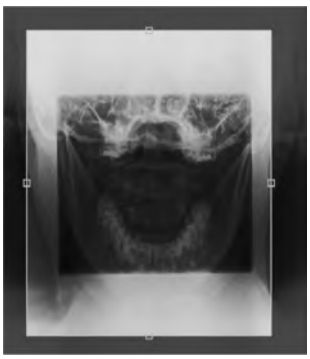
Button	Meaning
	**Automatic polygonal shutter** When started, there is an automatic suggestion on shutter positions, which you may change then. Areas of the image are automatically cropped. The shutter automatically detects blank areas caused by the lead. In most cases, you do not need to postprocess manually. The automatic shutter has a polygonal format. As such, it detects both oblique and irregular collimations with more than 4 sides. **Before the automatic shutter is switched on**  **After the automatic shutter is switched on** 
	**Automatic rectangular shutter** There is an automatic suggestion on rectangular shutter positions. 

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Button	Meaning
	**Define the region of interest by shuttering** The system can use the electronic shutters to identify the region of interest. This region is the basis for successful ranging. Ranging optimally displays the gray shades, which are important for diagnosis. • Function active: A change to the electronic shutters affects the ranging in such a way that only the visible region is optimally displayed. • Function not active: A change to the electronic shutters does not affect ranging. Philips recommends to have this function active at all times. Then it will make sure that changes in shuttering automatically result in a corrected working point (region of interest) for the image processing,
	Confirm.
	Reset.
	Cancel.

Simple Ranger Tool

In the Simple Ranger Tool you can manually set the position of the ROI (region of interest).

The position of the ROI determines two aspects:

- At the ROI, the image processing sets the brightness and maximum contrast.
- The exposure index (EI_s) is always measured at the position of the ROI.
  When you change the ROI with the Simple Ranger Tool, this will consequently change the value of the exposure index (EI_s) and the deviation index (DI) and its color code (green/yellow/red).

Normally, the UNIQUE2 working point is automatically determined based on the EPX settings (image processing protocols) and the image contents.
However, there are rare cases where this automatism does not give satisfactory results. Examples:

- Complicated anatomy (example patella)
- A large object with high absorption (for example, metal implant) in the image

This can result in far too dark or too bright images and not typical EI_s values. In these rare cases, you can use the Simple Ranger Tool to set the correct working point, and with this the image brightness.

Assuming you are in the **Examination** or **Review** section:

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► Select the Simple Ranger Tool.

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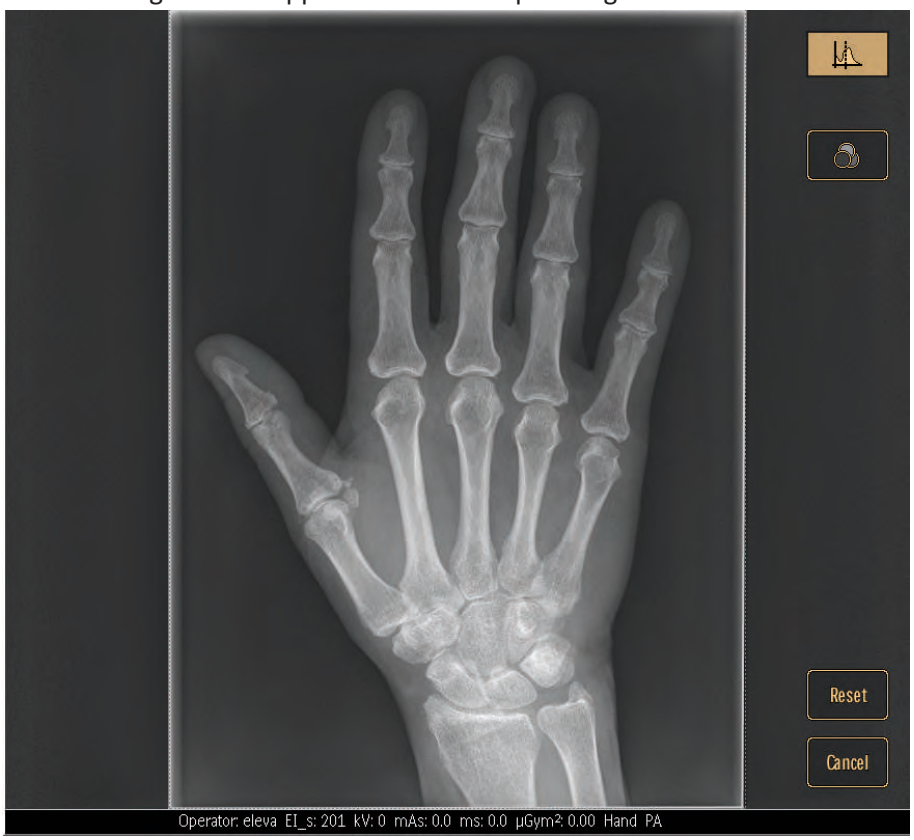
⇨ The following window appears and the Simple Ranger Tool is active:



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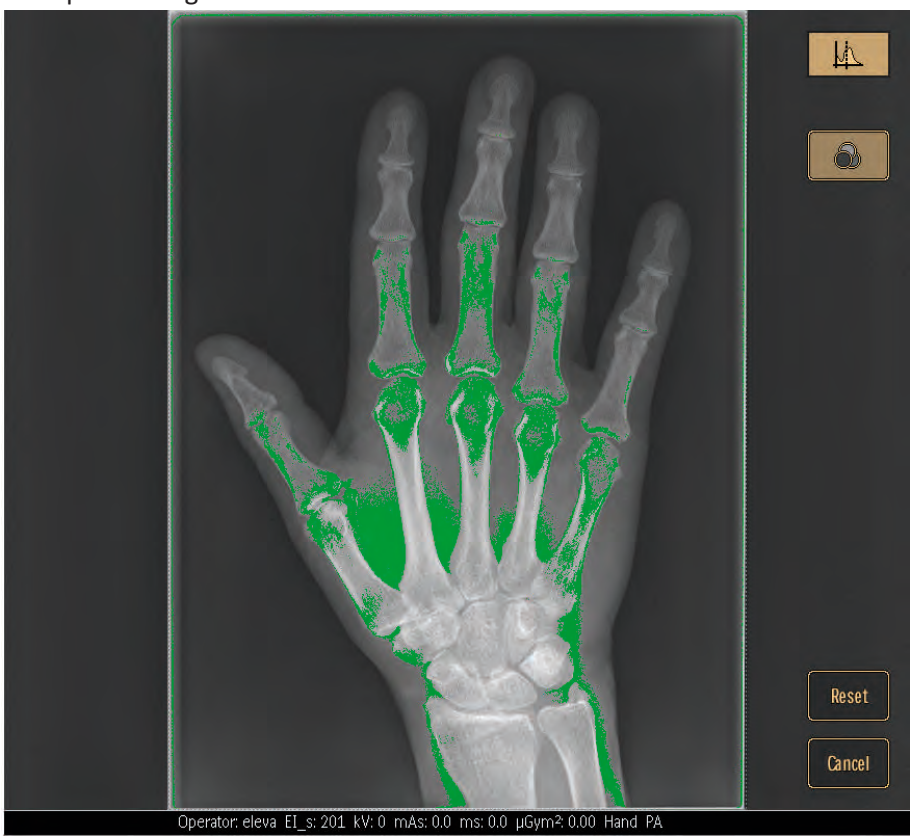
- Select or deselect the color mode. In this mode the ROI (Region of Interest) is shown in green color. The ROI is all the points in the image that have the same dose value as the UNIQUE2 ranger working point.
  Example of image in color mode:



- Click a representative point in a diagnostically important image area (ROI).

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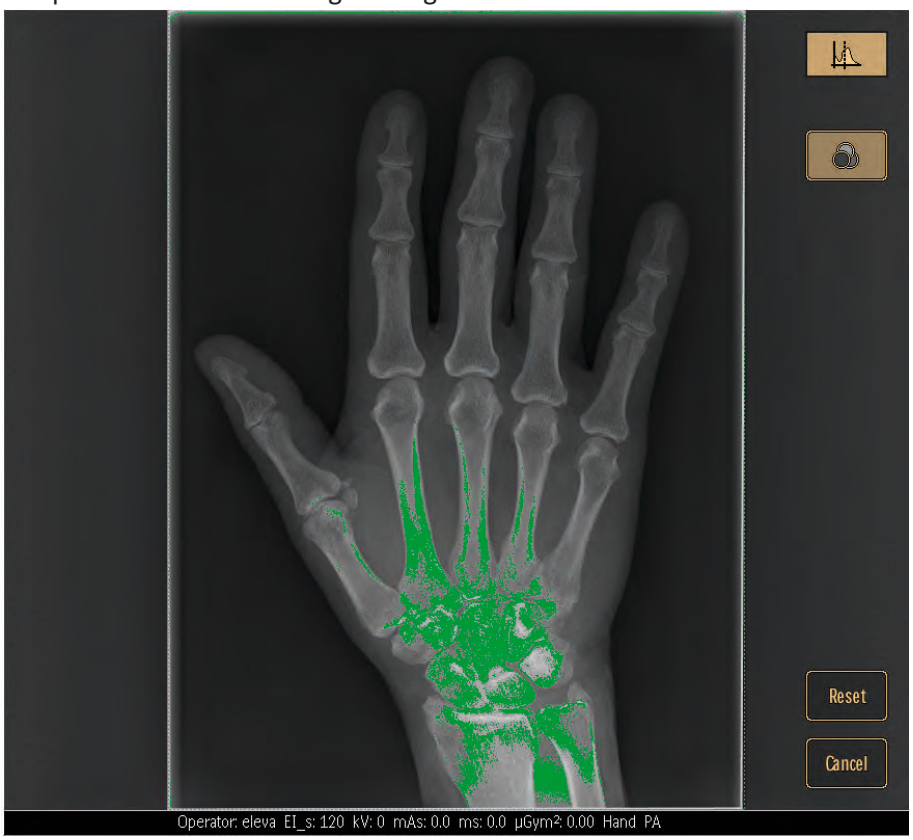
⇨ This point becomes the new working point for UNIQUE2 image processing and EI_s calculation. This can be done in color mode or normal mode.
The picture shows the changed image in color mode:



NOTICE

If the green marks are not within the region of interest, place the green markings there manually. Only after this action the EI_s and DI will show proper results.

NOTICE

This change only applies to the present image and has no impact on other images.

► Accept.

or

► Reset.

or

► Cancel.

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Setting Contrast and Brightness

Here you can find the following tools:

Button/display	Meaning
	Exit tool (accept changes).
	Brightness of displayed image.
	Contrast of displayed image.
	Brighter; Also possible on the touch screen, using your finger (move upward).
	Darker; Also possible on the touch screen, using your finger (move downward).
	Increase contrast; Also possible on the touch screen, using your finger (move to right).
	Reduce contrast; Also possible on the touch screen, using your finger (move to left).
	Invert image.
	Reset changes to original state.
	Cancel changes and exit tool.

You can change contrast and brightness in the image itself on the monitor using your finger or using the mouse.

Using the Mouse

- Click the image and keep mouse button pressed.
- Change contrast: Move mouse horizontally.
  Change brightness: Move mouse vertically.
- Confirm or reset the changes using the function buttons.

Using Your Finger

- Touch screen.
- Change contrast: Move finger horizontally.
  Change brightness: Move finger vertically.
- Confirm or reset the changes using the function buttons.

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If contrast/brightness adjustments do not result in the expected image presentation, you may try to improve it by selecting a different image processing protocol or by changing the image processing working point using the Simple Ranger Tool.

Scaling

This function does not affect the exported or printed image.

Here you can find the following tools:

Button/display	Meaning
	Exit tool (accept changes).
	Size of the displayed image in relation to its size on the detector or image plate.
	Scale image to the shutters. The collimated area is scaled to screen size. Note: If there are elements (e.g. annotations) outside the collimated area, a bounding box is set. This bounding box contains the collimated area and all elements outside the collimated area. So if you change the shutters, all elements will still be visible.
	Display entire image. Any image bigger than “Full image” can be moved within the window using the mouse or using your finger on-screen.
	Magnify image.
	Reduce image.
	Display image approx. 100%.
	Display image in 100% pixel size (1 image pixel corresponds to 1 screen pixel).
	Region of interest: Click the region of interest in the image; the image will be displayed in 100% pixel size. The region of interest will be displayed in the center.
	Reset changes to original state.
	Cancel changes and exit tool.

You can move the image using the mouse or using your finger directly on the screen (not in full screen mode).

Using Your Finger

- Touch screen and move image.

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Using the Mouse

- ► Click the image with the left mouse button, keeping it pressed.
- ► Move image.

Calibration and Measurements

The images are calibrated to the known pixel size. Recalibrate the image to the known size of a calibration object in the plane of interest. Perform this to increase the accuracy of the measurements.

WARNING

Especially for orthopedic length measurements, calibrate only if you know the proportions in the image (for example, using a calibration object in the plane of interest). Otherwise you get false measurements. After calibration, all measurements are related to the dimension defined with this calibration.

WARNING

Risk of Misusage!

- **Do not use the stitching ruler for calibration. The stitching ruler and the anatomy are not on the same plane. Therefore, they have different magnification factors on the detector. This means that absolute values cannot be measured. The values are suited only for orientation. For the calculation of the magnification factor, see the chapter “Image Scaling”.**

  Calibrate each image (including the composite image) by using a calibration object in the plane of interest. After calibration, all measurements are related to the dimensions defined with this calibration.

Here you will find the tools for calibration and measurements.

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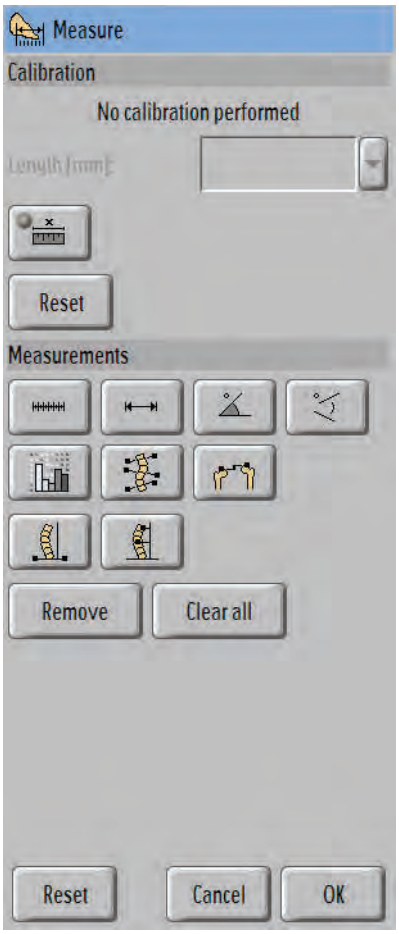

Button	Meaning
Calibration	
	Activate or deactivate the calibration.
	Reset the entered value and deactivate the calibration.
Measurements	
	Create a ruler.
	Measure the distance.
	Create an angle.
	Create an open angle.

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Button	Meaning
	Calculate the raw pixel values inside a square: md = median av = average sd = standard deviation size = edge length in pixels
	Cobbs angle II (optional, coupled to stitching license)
	Measure the height difference of femoral heads (optional, coupled to stitching license). Place a point on each femur within the hip joint. The height difference of the femurs is automatically calculated.
	Set a vertical reference line. Activate the line to move it or to set measurement points (see below).
	Set measurement points to measure distances from a vertical reference line. First set a vertical reference line (see above) and activate it, then use this tool to add measurement points. Activate a measurement point to move it.
	Delete the selected elements.
	Delete all elements.

Calibration

NOTICE

To calibrate a composite, you must exit the stitching tool before you can select the tool for calibration and measurements.

- Select the scaling tool.

- Select the “pixel to pixel” display. This gives a more accurate calibration value.

- Select the calibration tool.

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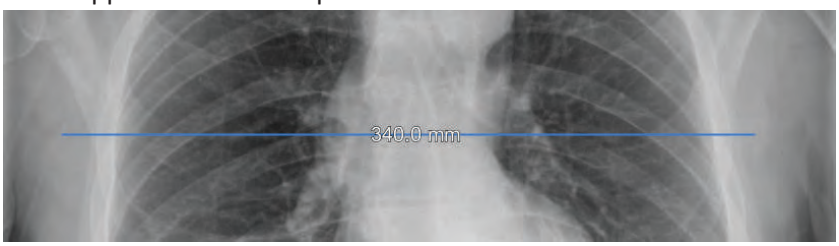
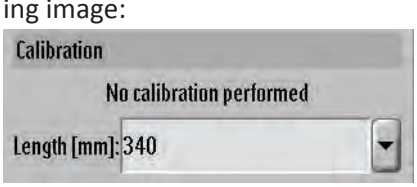
⇨ A line appears in the view port.

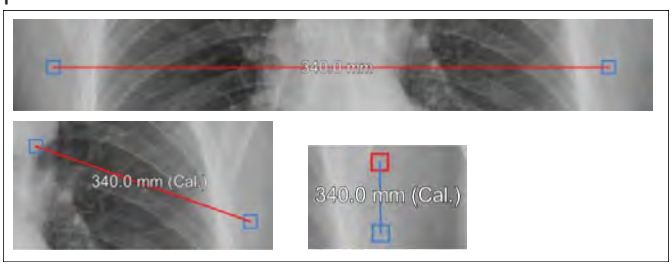


⇨ The line has a set value, for example 340 mm. This value is displayed as shown in the following image:



⇨

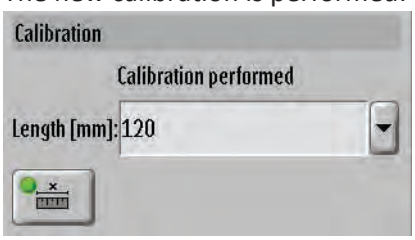
⇨ You can move, rotate and change the length of the line with help of the blue ends. Examples:



► Position the line on the calibration object.

► Enter the actual size of the calibration object (in mm) and press Enter.

⇨ The new calibration is performed:



NOTICE

Once the image is calibrated, you can show or hide the calibration line on the image (for export or print) by toggling the calibration button:

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► If necessary, press this to remove the calibration and return to the default pixel size.

CAUTION

Each calibration is applied to the current image.
If you create a new composite image by manual stitching, you must also calibrate this new composite.

Measurements

You can add measurements, angles, cob angles and femoral height differences.

► Select the required tool and activate it by clicking points in the image.

For more precise positioning, use the life size or pixel-to-pixel scale (see section “Scaling”).

You can modify all graphics that you have placed on the image:

► Reselect the graphic and select **Remove**

or

► select **Clear all** to remove all graphics at once.

NOTICE

The calibration and measurements are available in mm only.

Moving Images Between Examinations

With this function you can move an image from one view to another, if you have either released an exposure for the wrong projection or patient folder and did not realize your mistake until later. This function is available in the examination section only.

Resetting an Image

Reset the image manipulations to default:

- Scale to original size
- Rotate to predefined rotation
- Delete all annotations (with the exception of automatic markers and automatic annotations)
- Delete all measuring marks
- Cancel all brightness and contrast changes
- Cancel all shutter changes
- Delete calibration
- Reset to predefined image manipulation

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Stitching (Optional)

The system supports joining of several images to produce one large image. The stitching function is available in the examination section only.

Selecting The Image Processing Protocols

WARNING

For the administrator only!

The incorrect use of image processing functions can give rise to artifacts in the image. Image information of relevance to diagnosis may be suppressed or misrepresented. You must have expert knowledge of digital image processing to change preset processing protocol parameters.

Image processing protocols are parameter sets for processing raw image data into images with diagnostic capability. Each protocol is optimized for a specific part of the body. To make protocols easier to find, they are sorted by body region.

During installation or user-specific system configuration it is defined with which technique the views are processed.

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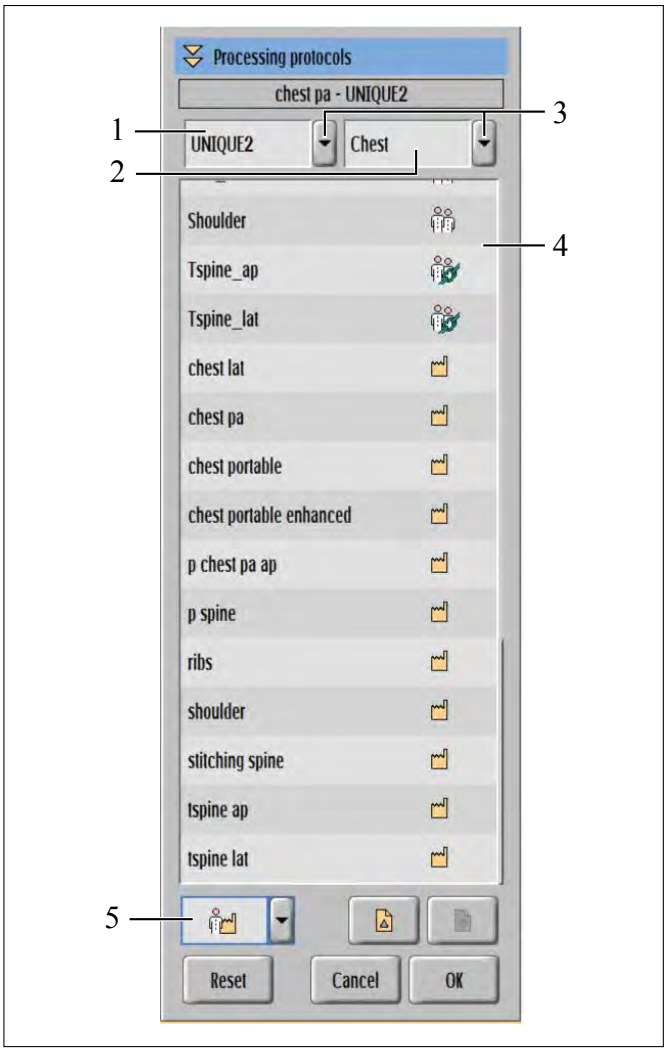

No.	Meaning
1	Display of the selected processing protocols
2	Display of the selected body region

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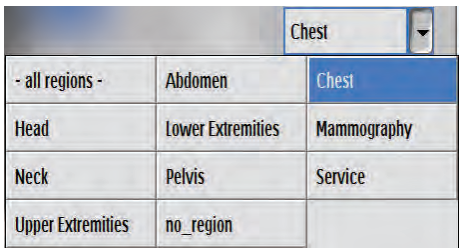
No.	Meaning
3	Using the arrows, open the menu to select the processing parameters and the body regions. You can select the following processing protocols:  You can select the following body regions: 
4	Available image processing protocols. The background of the selected image processing protocol turns blue.  Preset image processing protocol that is linked to at least one view in the anatomical database  User defined image processing protocol that is linked to at least one view in the anatomical database You cannot delete or modify the following image processing protocols: • Preset image processing protocols • User defined image processing protocols that are linked
5	Filters:  Preset image processing protocols  User defined image processing protocols  Preset and user defined image processing protocols

► Confirm or reset the changes using the function buttons.

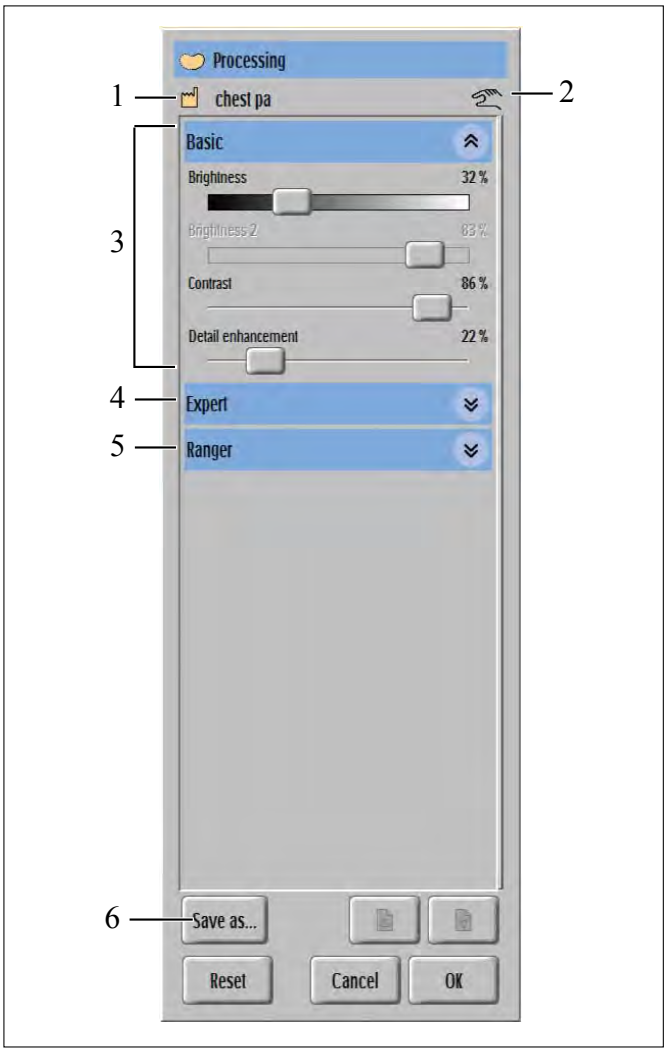
Setting The Image Processing Parameters

WARNING

For the administrator only!

The incorrect use of image processing functions can give rise to artifacts in the image. Image information of relevance to diagnosis may be suppressed or misrepresented. You must have expert knowledge of digital image processing to change preset processing protocol parameters.

Using the image processing parameters, you can generate image processing protocols or customize them to your needs.



No.	Meaning
1	Current image processing protocol.
2	The original image processing protocol has been modified and the modification has not been saved yet.
3	Basic image processing parameters.

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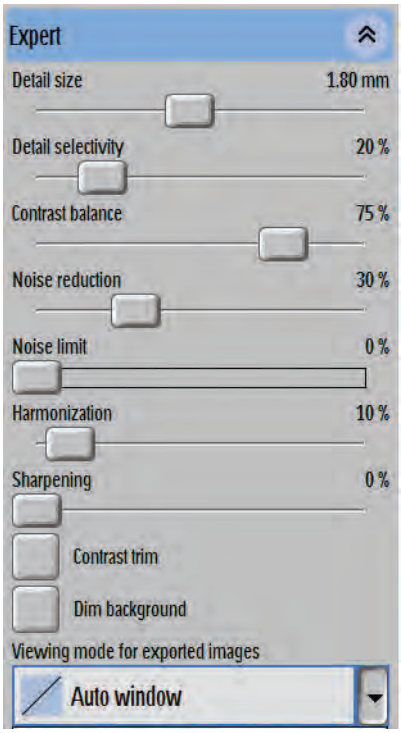
No.	Meaning	
	Brightness	Sets the brightness at the ROI (region of interest, marked in green in the **Ranger** tool). At this point the image will have the highest contrast.
	Brightness 2 (only in mode **Auto (lungs)**)	Sets the brightness of the abdomen in a lung image (marked in red in the **Ranger** tool).
	Contrast	Sets the contrast in the image. This is only available in semi mode.
	Detail enhancement	Sets the amount of additional detail enhancement.
4	Open the **Expert** image processing parameters. The following appears:	



Detail size	Sets the size for detail enhancement (in mm)
Detail selectivity	Sets the width of detail sizes
Contrast balance	Increases the contrast in very white areas (low dose) and very black areas(high dose)
Noise reduction	Reduces the noise in the entire image independent of the local density.
Noise limit	On top of noise reduction this reduces noise in high density areas only.
Harmonisation	Reduces the overall contrast without changing the detail contrast
Sharpening	Additional sharpening, if finest details should be enhanced when noise is not an issue.
Contrast trim	Reduces black edge artifacts
Dim background	Creates a black background
Viewing mode for exported images: **Auto window** **Interactive sigmoid** **Interactive linear**	In **Auto window** mode the initial image impression is optimal. All processing settings are “burnt into” the exported image. Black and white areas in the export image cannot be retrieved. In the two interactive modes the initial image impression may not be optimal. The processing settings are not “burnt into” the exported image. Black and white areas in the export image can be retrieved.

5	Open the **Ranger** parameters. The following appears:	

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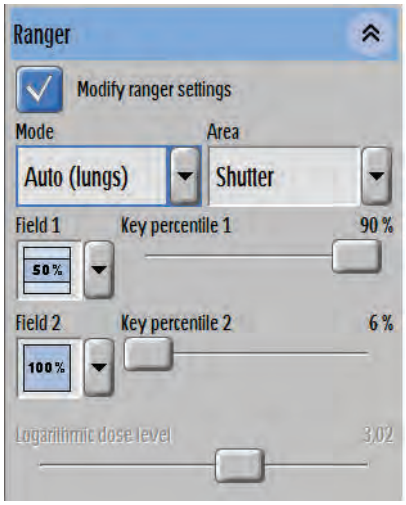
No.	Meaning	
	**Modify ranger settings**:	Activate or deactivate the ranger When the ranger is activated, you can change the parameters and the region of interest is marked (green or red).
	Mode:	Select the ranger mode: **Semi**, **Auto (lungs)**, or **Manual**. Chest examinations should be set to the ranger mode **Auto (lungs)**. **Semi** is the default for other examinations.
	Area:	Select **Shutter** or **Fullsize**. This defines the image area that is used by UNIQUE for ranging.
	Field 1:	Select the part of the “Ranger area” for UNIQUE to determine the ranger working point (relates to **Key percentile1**).
	Key percentile 1:	Number of pixels (in %) that are darker than the ranger working point. Adjust it to change the working point and ROI.
	Field 2:	Only available in the ranging mode **Auto (lungs)**. **Field 2** works like **Field 1** and relates to **Key percentile 2**.
	Key percentile 2:	Only available in the ranging mode **Auto (lungs)**. For chest views, **Key percentile 1** defines the working point for lung tissue (marked in green), **Key percentile 2** defines the working point for the mediastine (marked in red).

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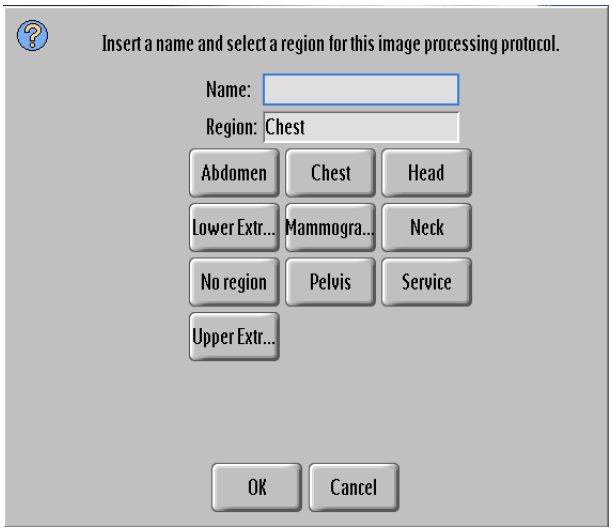
No.	Meaning		
		Logarithmic dose level:	Directly set the working point (only in the ranging mode **Manual**).
6	Save changes to image processing parameters (save as new parameter or override existing parameter). The following appears:  Enter new name of your choosing and select body region to which the new parameter (= preset) is to apply. Confirm with OK.		

► Confirm or reset the changes using **OK**, **Reset** or **Cancel**.

NOTICE

For further information on image processing, see the Application Guide “UNIQUE.”

SkyFlow (Optional)

SkyFlow is a software that provides grid-like image contrast for examinations that would require an anti-scatter grid.

With this license, the following settings are preset from the factory:

- SkyFlow works only for free exposures with the SkyPlate. It is not active when the SkyPlate is in the Bucky tray of the table or wall stand.
- If the grid is used, SkyFlow is automatically switched off for this image.

NOTICE

Use an anti-scatter grid in cases where it is clinically indicated.

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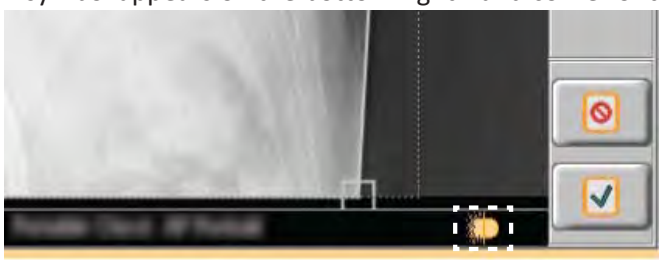
Working with SkyFlow

- ► Set the SID to approximately 130 cm (51.2 in) to receive optimal results.
- ► Do not use a grid.
- ► Make sure that the kV is set to ≥ 60 kV. (When the kV is set to < 60 kV, SkyFlow is not active.)
- ► Perform examinations with a portable detector with all further settings as usual.

⇨ A symbol appears on the bottom right-hand corner of the image.



In the **Review** section you can check the effect of SkyFlow on the image.

- ► Activate or deactivate the button to view the image with or without SkyFlow.

NOTICE

When the button is lit, the images are exported with SkyFlow. When the button is off, the images are exported without SkyFlow. Therefore, do not leave the button off by accident.

NOTICE

In order to use SkyFlow for a view, it has to be activated in the EPX database for this view.

Bone Suppression (Optional)

Bone Suppression is an image-processing algorithm that suppresses the bone structures in a chest image.

Bone Suppression is suitable only for the views “Chest PA” and “Chest AP” in erect position. In order to use this algorithm, Bone Suppression has to be selected in the EPX database for the views “Chest PA” and “Chest AP”. Bone Suppression is not intended to be used on pediatric patients.

The bone-suppressed image does not appear as an image on the Eleva Workspot. When the system sends the original image to the PACS or to the service partition, it automatically adds the bone-suppressed image.

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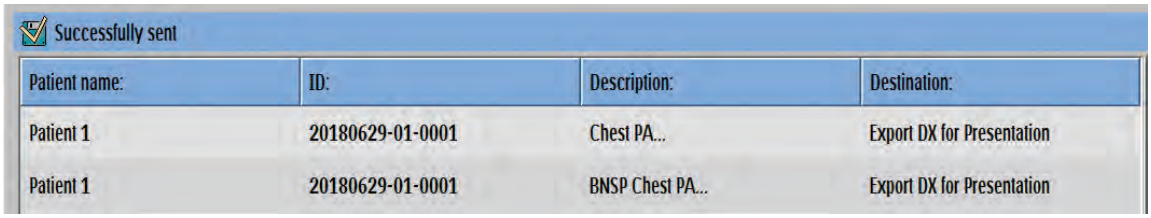
The export queue shows the original image and the bone-suppressed image. The bone-suppressed image receives the additional letters "BNSP" as shown in the following image:



The bone-suppressed image shows the following label:

For the bone-suppressed image, the system also adds the notation "BoneSuppression" in the public DICOM attribute "Image Comments" .

CAUTION

Risk of misdiagnosis

For diagnosis, the radiologist at the PACS must always use the bone-suppressed image and the original image.

Customizing the Image Manipulation Tools

The Customize function is available for the administrator only.

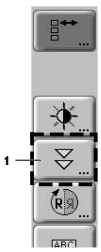
► Click this.

Customize

► Click **Customize**.
You can customize the image manipulation tools in the toolbar as you need them.

► Select tool or function you want.

⇨ The background of the button turns blue.



► Click the place in the toolbar where you want to put the tool or function (1).

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⇨ The selected tool appears in the toolbar (2) in the chosen place:

Removing an Image Manipulation Tool

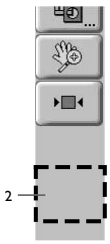
If you want to remove an image manipulation tool from the image manipulation toolbar, replace the tool with the blank button:

► Click the blank button.

⇨ The background of the button turns blue.

► Click the tool in the toolbar that you want to remove (1).

⇨ The selected tool is removed (2):



NOTICE

You can also restrict the availability of the function  to the administrator only:

► Click  to make this function available or not available for all users.

⇨ According to this, the function  will appear or will not appear in the toolbar for all users.

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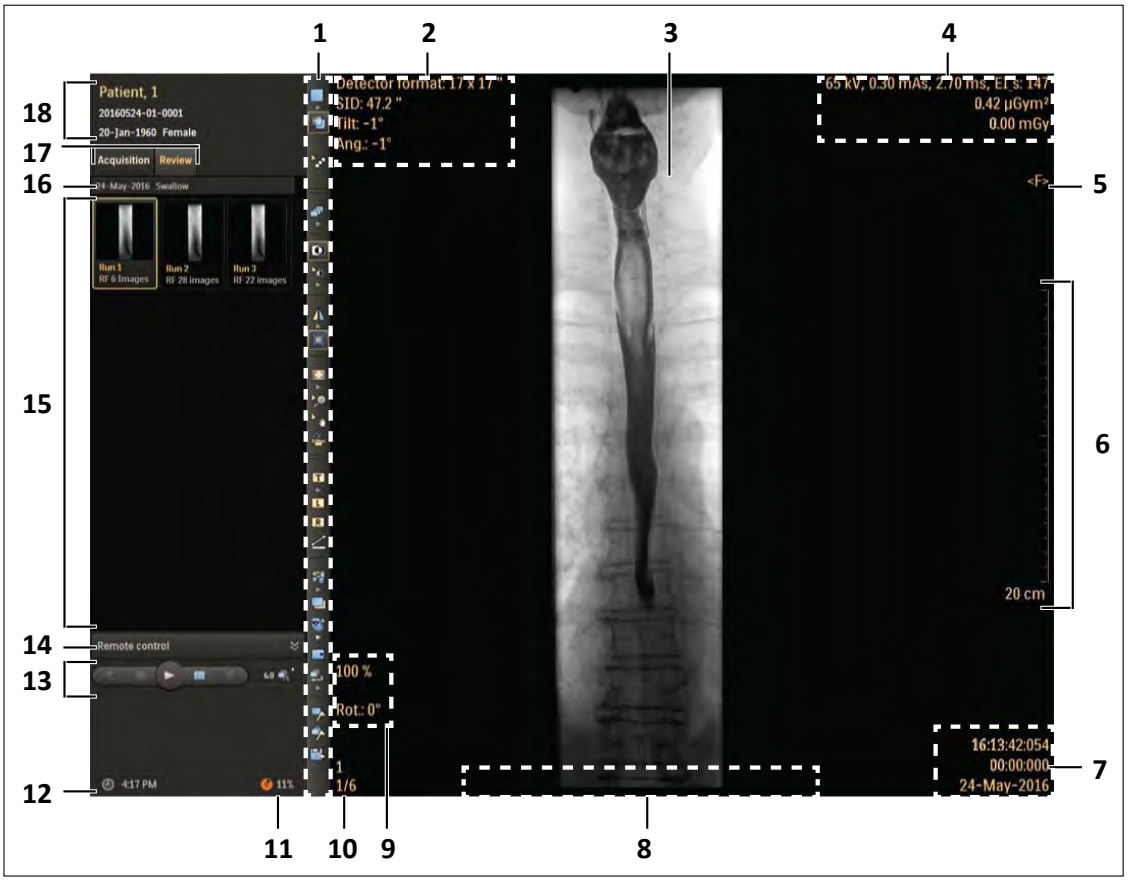
Fluoroscopy

Review on RF Viewer



No.	Meaning
1	Tools for image manipulation on RF Viewer
2	Display • Detector format The detector format displays the zoom level selected. • SID • Tilting of table • Angulation of column
3	Display of the selected fluoroscopy images and spot exposures
4	Display • Exposure data and exposure index • Dose area product per image

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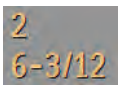
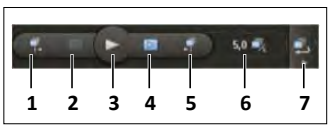
No.	Meaning	
	• Air kerma	
5	Shows up when saved fluoroscopy image is displayed.	
6	Display calibration line	
7	Display • Start time of the run • Time of the image within the run • Image date	
8	Display message that informs you not to use composite images for diagnosis of detailed structures.	
9	Display • Image scale • Image rotation	
10		Display • Run number • Image number/number of images in run
		Display (subtraction) • Run number • Image number, number of image used as mask image/number of images in run
		Display image numbers used for the trace image
11	Free memory	
12	System time	
13	Navigation bar 	
	1	Previous run
	2	Previous image
	3	Play/pause
	4	Next image
	5	Next run

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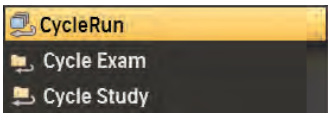
No.	Meaning
6	 Change the replay speed
7	Cycle run  Select whether one run, one exam, or one study is played.
14	Display functions when the remote control is used
15	Display of all saved fluoroscopy images and spot exposures
16	Date of examination and examination name
17	Select **Acquisition** or **Review**
18	Information on the selected patient

Image Manipulation on RF Viewer

A yellow frame indicates that you have selected the tool. Buttons with an arrow below provide additional image manipulation tools.

Button	Meaning		
	Tile viewing area		
		Select different tiling options	Auto tile layout determines the best option that is based on the number of images that have been saved to a maximum of 4 x 4 tiling.
		Display/hide image information overlay	
		Scroll through images	

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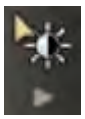
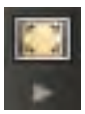
Button	Meaning		
	Propagation scope		
		Image	The propagation scope determines whether the processing will be applied to the image, the entire run, the entire examination or the entire study. Certain tools will not be available depending on the selected propagation scope.
		Run	
		Exam	
		Study	
		Invert image	
	Image manipulation		
		Contrast and brightness	
		Image processing parameters	See the following sections.
	Rotate and Flip		
		Flip images on the vertical axis	
		Flip images on the horizontal axis	
		Rotate image 90° clockwise	
		Rotate image 90° counter-clockwise	
		Reset	
		Shutter on/off	See the following sections.
		Display the entire image	

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Button	Meaning		
		Zoom pixel to pixel	
		Scaling (Magnification)	
		Pan image	
		Reset all attributes of the displayed (selected) image to the original values.	
	Annotation		
		Select text annotation	For text processing, see the following sections.
		Select arrow annotation	
		Select predefined annotations	
		Left marker	
		Right marker	
	Measurements		

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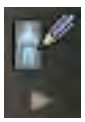
Button	Meaning		
			See the following sections.
	Stitching		
		Create a new composite image	See “Parallel Stitching”.
		Modify a composite image	
		Delete a composite image	
	Subtraction		See “Digital Subtraction Angiography”
	Tracing		
		Create a new trace image that shows the contrast media flow	
		Delete the selected trace image	
	Reference monitor	Send image to reference monitor	
		Cycle run	See “Review on RF Viewer”

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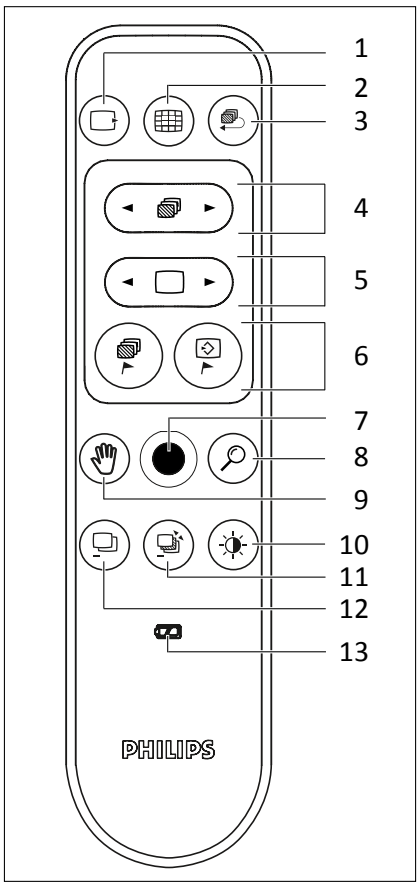
Button	Meaning	
	Flag image	
	Flag run	
	DICOM export of fluoroscopy and spot images	See “Exporting images on RF Viewer”

Working with the Remote Control



No.	Button	Meaning
1		Send image to reference monitor
2		Select tile viewing area. Displays 9 images (3x3 matrix) of the current run. Press the button again to restore full screen display.

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No.	Button	Meaning	
3		Replay of the current run	
4		◄	Select previous run
		►	Select next run
5		◄	Select previous image
		►	Select next image
6		Flag run	
		In Review mode: Flag image In Acquisition mode: Grab image	
7		Joystick:	
		Move the joystick (up, down, left or right) to navigate through the functions or images.	
8		Press and hold to reset zoom	
9		Press and hold to reset pan	
10		Select contrast and brightness	
11		Select remasking/landmarking	
		After remasking/landmarking:	
		Joystick left/right	Shift mask image
		Joystick up/ down	Increase/decrease landmarking gain
12		Switch subtraction on/off for the current run	
13		Charging indicator	
		When the LED lits, replace the batteries at your earliest convenience. See chapter “Replacing and Disposal of Batteries” on page 313.	

When you are in the examination room, you can navigate with the remote control through the review section on the RF viewer.

► Press any button on the remote control.

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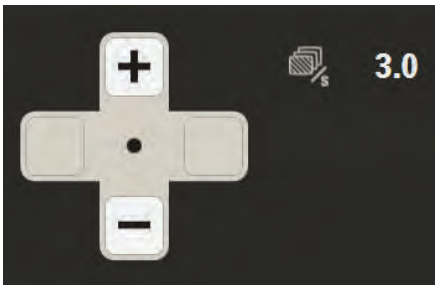
⇨ A cross-shaped group of buttons shows up on the RF viewer.

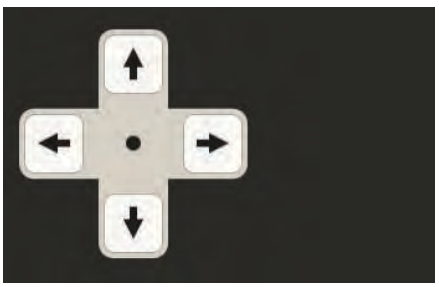
⇨ The button disappear automatically when the remote control has not been used for about 5 seconds.

Replay Speed



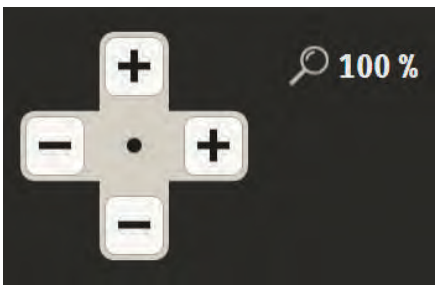
► Move the joystick to the top or button to increase or decrease the frame rate and therefore the speed.

Pan



► Move the joystick to the requested direction to move the image.

Zoom



► Move the joystick to the left or right to increase or decrease in big steps.

► Move the joystick to the top or bottom to increase or decrease in 1% steps.

⇨ The scaling value is displayed.

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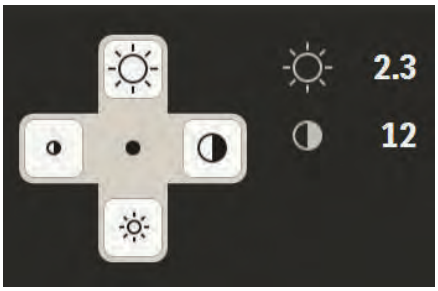
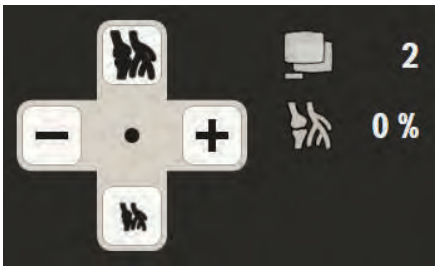
Contrast and Brightness



- ► Move the joystick to the left or right to decrease or increase the contrast.
- ► Move the joystick to the top or bottom to increase or decrease the brightness.

⇨ The contrast and brightness value is displayed.

Remasking/Landmarking



- ► Move the joystick to the left or right to shift the mask image.
- ► Move the joystick to the top or bottom to increase or decrease the landmarking gain.

Shutter Function

- ► Switch the shutters on/off.

⇨ When the shutters are on, they are active and adjustable.

Shutters are set automatically outside the collimated area. You will see collimator borders in the image. This is required by national standards.
The collimator borders might be disturbing, especially when the image polarity is reversed to “bones white”. You can change the shutter border width in the settings. Please check the applicable standards of your country.

- ► Select the System section.
- ► Go to “Settings/User interface/Image display/Shutter border width for fluoro and spot images”.
- ► Select the value as desired.

⇨ All four shutter borders are moved inwards by the chosen value.

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Annotations

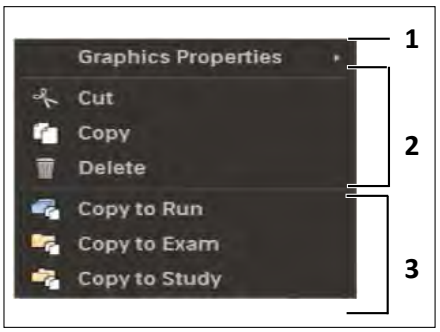
Annotations are always applied to a single image by default. You can copy them to other images.

- Select an annotation type.
- You can choose a predefined annotation or enter free text according to your needs.
- Place the annotation in the image.

Adjusting the Annotation

When you have annotated an image, you can adjust the annotation to your needs.

- Select the annotation.
- Right click.



No.	Description
1	Change the font size: Select **Graphics Properties** and **Font size**.
	Change the line width (arrow annotation only): Select **Graphics Properties** and **Line Width**.
2	Cut, copy or delete a measurement. When you have cut or copied a measurement, **Hide** shows up.
3	Copy the measurement to the run, examination, or study.

When you activate an annotation, you can delete it by pressing the delete key on the keyboard.

Cut and Copy an Annotation

- Select **Cut** or **Copy**.
- Right click in the image where you want to place the annotation.
- Click **Paste Graphic**.

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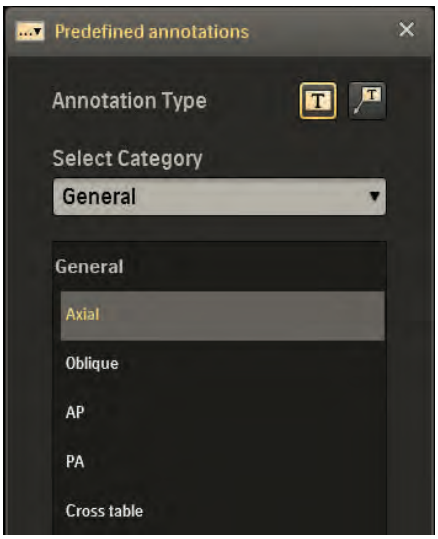
Create and Modify Predefined Annotations

► Click on the error to open the menu.

► Click this.



► Select **Annotation Type**.

► Drag an entry from the list and drop the entry in the image.

Adjusting Predefined Annotations

► **Select Category**.

⇨ The predefined entries of this category are displayed.

► Right click on an entry if you want to add, delete, or change the entry.

► You can add a new category if needed.

Measurements

Button	Meaning
	Enable calibration line and define the length in millimeter
	Measure the distance
	Create an angle by drawing three points

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Button	Meaning	
	Create an open angle by drawing two lines	
	Create cobb angle (optional, coupled to parallel stitching license)	
	Measure the height difference of femoral heads (optional, coupled to parallel stitching license) Place a point on each femur within the hip joint. The height difference of the femurs is automatically calculated.	
	Set a vertical reference line (optional, coupled to parallel stitching license) Activate the line to move it or to set measurement points (see below).	
	Set measurement points to measure distances from the vertical reference line (optional, coupled to parallel stitching license) First set a vertical reference line (see above) and activate it, then use this tool to add measurement points. Activate a measurement point to move it.	
	Create a rectangle	Pixel and dose values are calculated and displayed: • md = median • av = average • sd = standard deviation • size = edge length (rectangle only)
	Create a circle	
	Measure the length ratio between two lines	

When you have used the measurement function, you can adjust the measurements to your needs.

Measurements are always applied to a single image by default. You can copy them to other images.

► Select the measurement.

► Right click.

⇨ Depending on the measurement that has been made, the appropriate tools show up.

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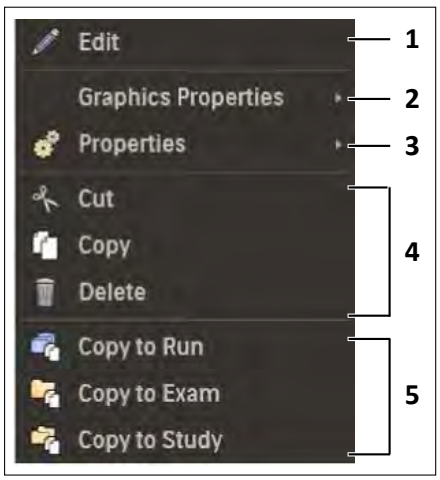

Fig. 21: Example: Tools for Adjusting Measurements

No.	Description
1	Add a text to the measurement and edit it.
2	Change the font size: Select **Graphics Properties** and **Font size**.
	Change the line width: Select **Graphics Properties** and **Line Width**.
3	Display or hide the length of the measurement lines.
4	Cut, copy or delete a measurement. When you have cut or copied a measurement, **Hide** shows up.
5	Copy a measurement to the run, examination, or study.
	Add a histogram to the dose and pixel values calculated. Select **Show Histogram**.
Not shown	Show a density profile along the measurement line

When you have activated the end points of a measurement, you can delete the measurement by pressing the delete key on the keyboard.

NOTICE

If you delete the pixel size calibration, the value will be reset to default.

Cut and Copy a Measurement

- Select **Cut** or **Copy**.
- Right click on the image where you want to place the measurement.

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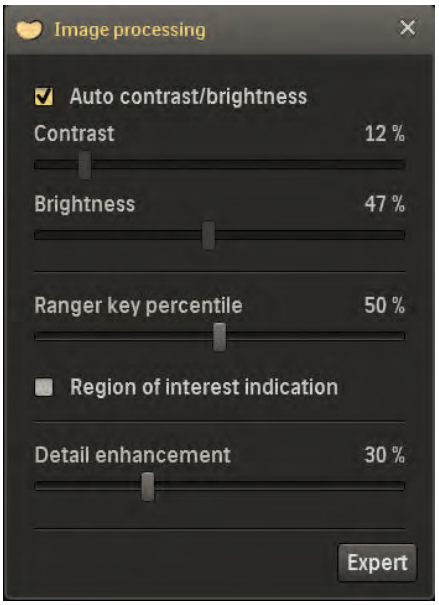
► Click **Paste Graphic**.

Setting Image Processing Parameters on RF Viewer

► Click this.



► Click **Expert** to open more image processing parameters.

► Change the image processing to your needs.

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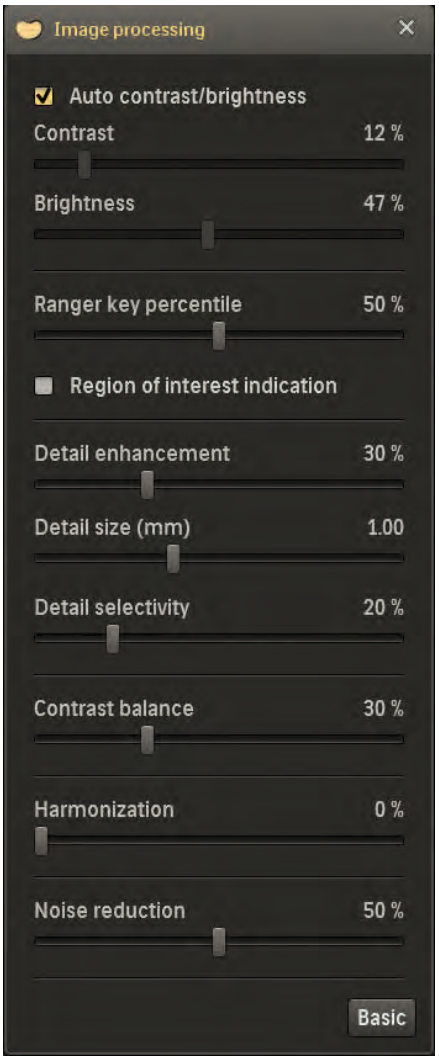

Image Processing	Meaning
Auto contrast/brightness	Adapts contrast and brightness to the image area within the electronic shutters automatically.
Contrast	Controls the contrast for the image.
Brightness	Controls the brightness for the image.
Ranger key percentile	Number of pixels (in %) that have lower dose than the ranger working point. Adjust this to change the working point and ROI.
Region of interest indication	If this is selected, all the pixels are colored green that have the same dose as determined for the ranger working point (ROI).
Detail enhancement	Enhances the contrast of details relative to their environment.
Detail size (mm)	Defines the size of details in mm that are enhanced.
Detail selectivity	Defines whether only details of the specified detail size are enhanced or details of all sizes. If detail selectivity = 0%, details of all detail sizes are enhanced equally. If detail selectivity = 100%, only details of the specified detail size are enhanced.
Contrast balance	Defines how the details are enhanced in image areas with different dose levels. If contrast balance = 0% the detail enhancement is at its maximum at the working point of the ranger (ROI) only. If the contrast balance = 100%, the detail enhancement is the same at all dose levels.
Harmonization	Reduces the overall contrast in the image. This allows you to increase the contrast of details without clipping.
Noise reduction	Allows to adjust the strength of the noise reduction algorithm for the displayed image.

Exporting Images on RF Viewer

- Click this to export fluoroscopy and spot images to an external DICOM destination.

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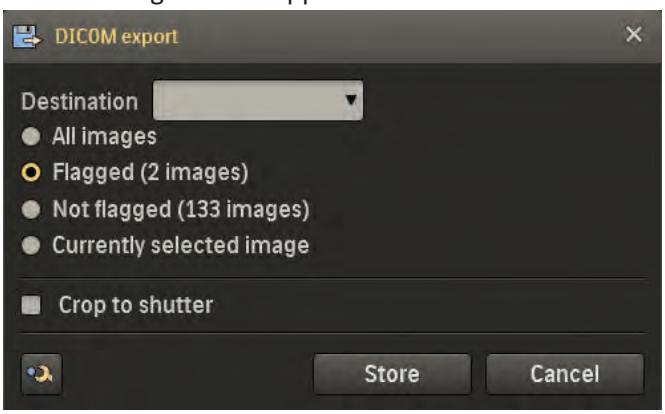
⇨ The following window appears:



Button/text	Meaning
Destination	Export destination • All configured DICOM nodes
	Select the images you want to export.
Crop to shutter	The selected images are cropped. Only the area within electronic shutters and annotations will be exported.
	Save selected images for customer service in “service area”. If required, you can also save the raw image with it.
Store	Export now.
Cancel	Close export function.

An icon on the saved fluoroscopy and spot images displayed on the left hand side of the RF viewer shows the export status.

Icon on image	Export status
	Completing export.
	Export completed.
	A problem has occurred. Export failed.

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Mouse and Keyboard Short Cuts on RF Viewer

Function	Short Cuts	Mouse Pointer	Description
Scroll	Rotate the scroll wheel in the view area.		Scroll through all images of the examination in vertical direction.
Contrast and brightness	Press the scroll wheel in the view area.		Drag horizontal to adjust the contrast.
			Drag vertical to adjust the brightness.
Pan	Press the left mouse button and the scroll wheel in the view area.		Move the image as needed.
Zoom	Press the scroll wheel and the right mouse button in the view area.		Move upwards to zoom in.
			Move downwards to zoom out.
Electronic shutters	Move the cursor over the shutter borders. Press the left mouse button.		The shutter lines will appear. Drag the adjustment handle to move the single shutter line.
			Example: Move the left shutter line.
	Move the cursor over the shutter borders. Press the scroll wheel.		The shutter lines will appear. Drag the adjustment handle to move the shutter lines symmetrically.
	Move the cursor over the shutter borders. Press **Ctrl** and the left mouse button.		
Flag	Press **F8**.		The activated image is flagged. To remove the flag, click in the image and press **F8** again.
	Press **Ctrl** and click in the requested image.		The activated image is flagged. To remove the flag, press **Ctrl** and click in the image again.
	Press **Shift** and click in the first and last image of the desired sequence.		A range of images are flagged.
Tiled view	If the view is tiled, double click in the requested image.		The single image is displayed. Double click to switch between the single image and the recent used tiled view.

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Parallel Stitching (Optional)

Creating a New Composite Image

You can create a new composite image, for example, for the following:

- The automatically created composite image shows defects.
- You want to modify the composite image, for example, by splitting it into two composites.

► Select the appropriate area scan.

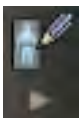
► Click on the arrow to open the menu.

► Click this.

⇨ A new composite image of the selected area scan is created and shown in the Review section.

Modifying a Composite Image

► Select the composite image that you want to modify.



► Click on the arrow to open the menu.

► Click this to modify the composite image.

⇨ The following window appears:

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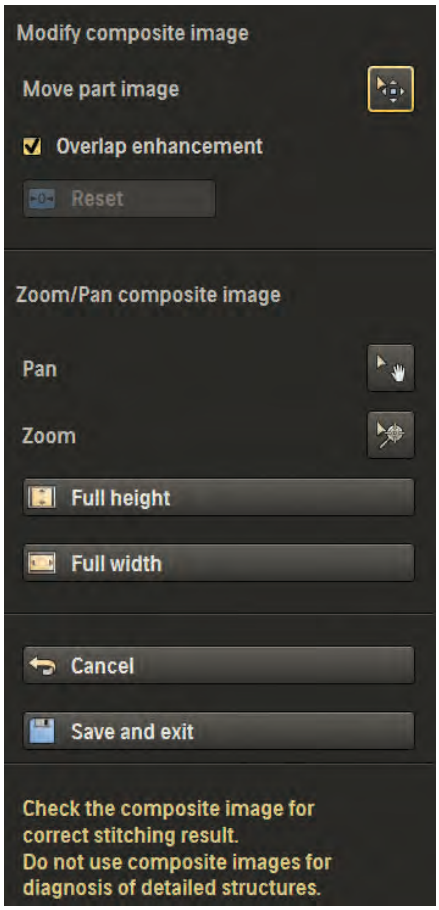
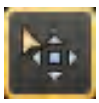


Button/text	Meaning
Modify composite image	
	Move part image
Overlap enhancement	Display the overlapping areas as subtracted area
Reset	Reset the active part image to the original status
Zoom/Pan composite image	
	Pan
	Zoom
Full height	Display the composite image at full height
Full width	Display the composite image at full width

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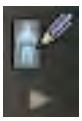
Button/text	Meaning
Cancel	Cancel changes and exit the tool
Save and exit	Save the changes and exit the tool

Moving a part image

- ► Select a part image.
- ► To move the part image, do one of the following:
  - Use the left mouse button and keep the mouse button pressed.
  - Click the arrows in the menu.
  - Press the arrow keys on the keyboard.
- ► Click **Previous** or **Next** in the menu, to activate the previous or next part image.

Deleting a Composite Image

- ► Select the composite image that you want to delete.



- ► Click on the arrow to open the menu.

- ► Click this.

⇨ A message appears.

- ► Click **Yes**.

⇨ The composite image is deleted.

Digital Subtraction Angiography (Optional)

Manual Corrections with the Subtraction Tool

- ► Click this to open the subtraction tool.

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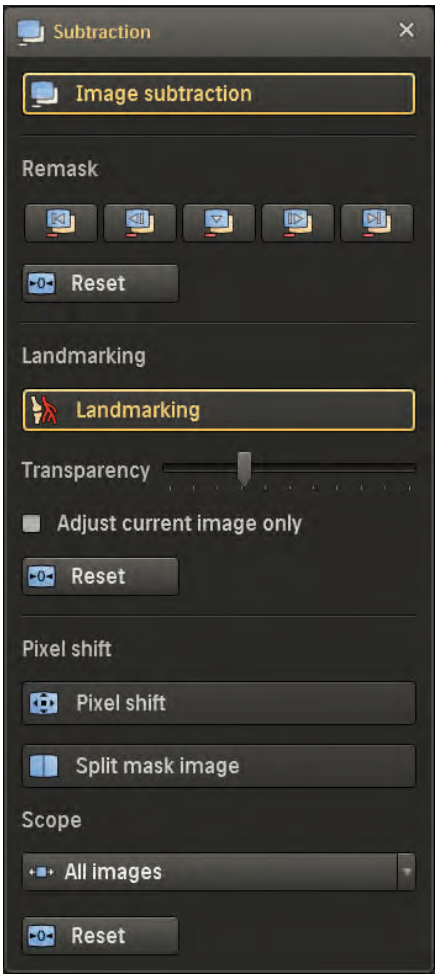
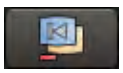
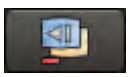
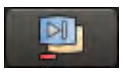


Button/text		Meaning
	**Image subtraction**	Select image subtraction.
Remask		
		Set the first image in the current run as the new mask image.
		Set the image before the current mask image as the new mask image.
		Set the current image as the new mask image
		Set the image after the current mask image as the new mask image.
		Set the last image in the current run as the new mask image.

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Button/text		Meaning
	Reset	Reset the mask to the default mask used during acquisition. The third image is the default mask image. The default mask image can be set in the EPX database according to your needs.
Landmarking		
	**Landmarking**	Select landmarking to fade in background anatomy.
	Transparency	Fade in background anatomy by adjusting the slider. You can also use the landmarking function via the remote control.
	Adjust current image only	Apply the landmarking only for the current image.
	Reset	Reset the changes.
Pixel shift		
	Pixel shift	Move the mask image pixel by pixel.
	Split mask image	Divide the image in two, for example, when examining legs. You can perform pixel shift on both images separately.
	Scope • **Following images** • **Preceding images** • **All images** • **Current image**	Apply changes to the selected scope.
	Reset	Reset the changes.

Moving the Mask Image

► Select **Pixel shift**.

⇨ The following menu appears:

► To move the mask image, do one of the following:

- Use the left mouse button and keep the mouse button pressed.
- Click the arrows in the menu.
- Press the arrow keys on the keyboard.

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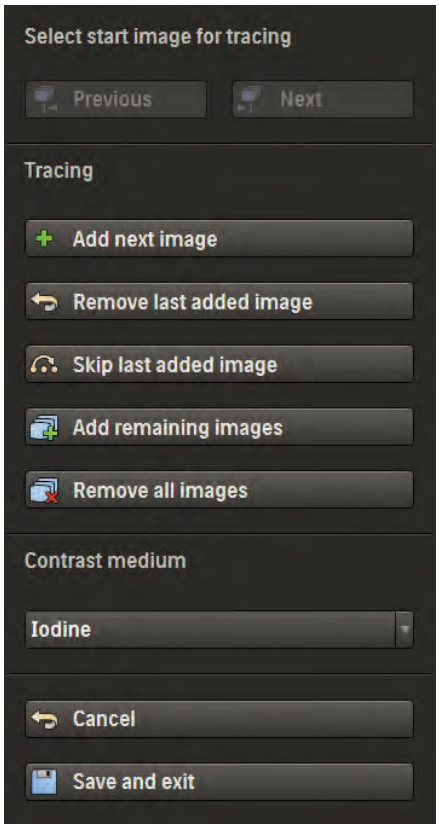
Tracing

Tracing Tool Overview



Button/text	Meaning
Select start image for tracing	
Previous	Select previous image
Next	Select next image
Tracing	
Add next image	Add next image to the trace image
Remove last added image	Remove the last added image from the trace image
Skip last added image	Remove the last added image and add the next image
Add remaining images	Add all remaining images of the run
Contrast medium	
• **Iodine**	Select the contrast medium that has been used

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Button/text	Meaning
• **CO2**	
Cancel	Cancel and exit the tool
Save and exit	Save the trace image and exit the tool

Creating a Trace Image

Tracing creates an overview image from the selected images. This trace image shows the whole vessel tree filled with contrast media.

► Select the desired run.

► Click on the arrow to open the menu.

► Create a new trace image.

► Make sure that the correct contrast media is selected.

► To navigate to the image that you want to use as the starting point, use the **Next** or **Previous** button.

► Add, skip or remove images by using the trace tool functions.

► To cancel without saving, click **Cancel**.

► To complete the trace image, click **Save and exit**.

Deleting a Trace Image

► Select the trace image that you want to delete.

► Click on the arrow to open the menu.

► Click this.

⇨ A message appears.

► Click **Yes**.

⇨ The trace image is deleted.

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11 Print

General

The Print function is available for radiography images that are acquired with the registration devices “Table”, “Wall stand”, “Free detector”, “Free cassette” only.

Print Section

In the Print section you have easy and direct access to all the images in the selected patient’s image memory. You can select print and film parameters, and lay out images on preformatted print templates and manipulate them.

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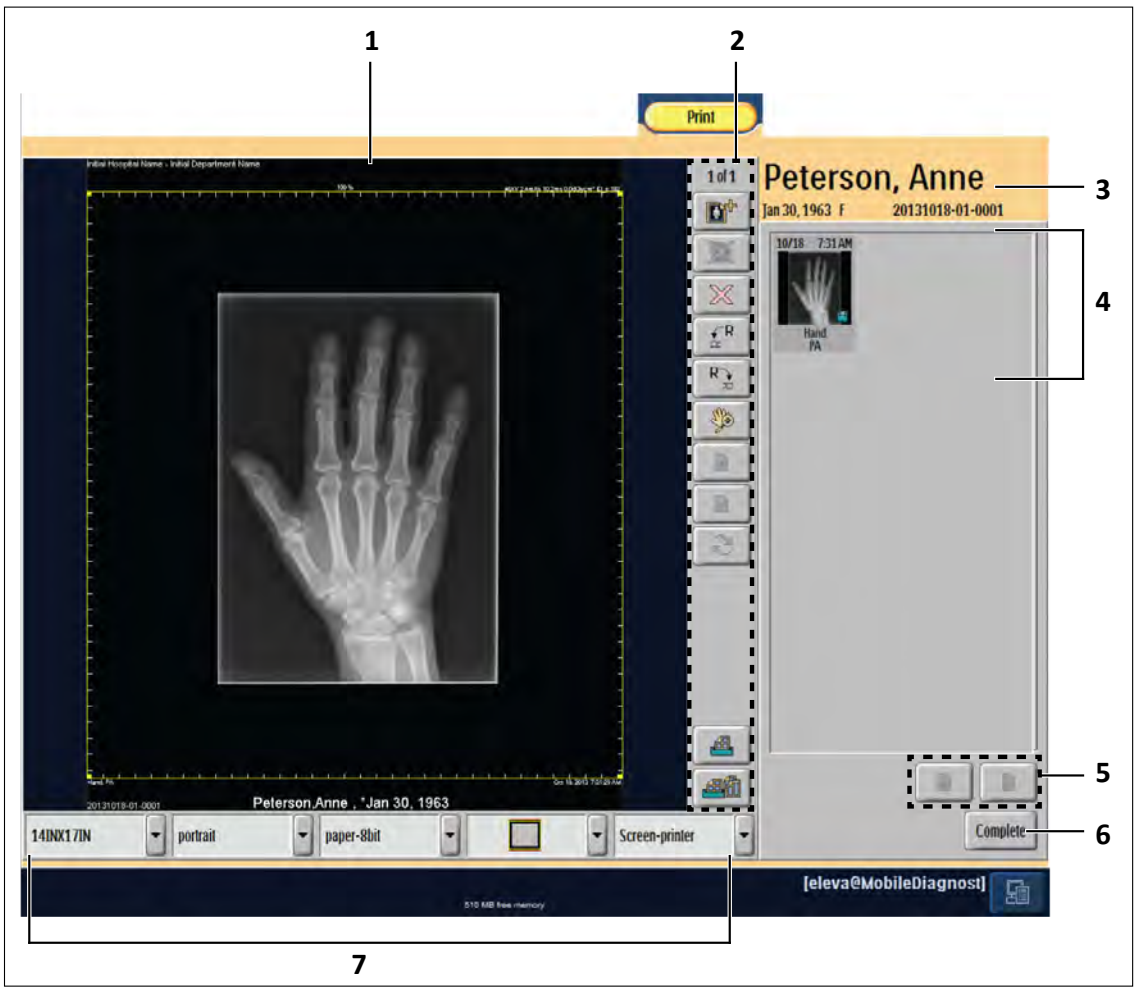

No.	Meaning
1	Film preview and layout area. It shows the layout of the current image.
2	Tools for free composing, see chapter “Tools for Free Composing” on page 226 and tools for image handling, see chapter “Tools for Image Handling” on page 225.
3	Patient information window. It shows the following: • Patient name • Patient ID • Date of birth • Sex
4	Image memory. It shows all images of a patient. If there are more images than can be shown in the window, you can scroll through them.
5	Scroll through the image memory.
6	Complete patient and trigger all print jobs.
7	Tools for film and printer settings, see chapter “Tools for Film and Printer Settings” on page 223.

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Tools for Film and Printer Settings

Editing Settings for a Page

You can change the printer settings by selecting them from a selection window in the menu bar. Some of the settings that are available depend on which printer is selected (for example format, medium).

If more than one page is sent to the printer, you can edit each page individually. You can move from page to page using “Next” and “Back.”

Printer

► Click this.

⇨ A list of all available printers appears.

► Select printer.

NOTICE

Your choice of printer influences the list of available print media (size, format, type). The menu bar shows only the print media supported by the selected printer. When you change the printer, the print media (size, format, type) may change accordingly.

Size of Medium

► Click this.

⇨ A list of all available medium sizes appears; it depends on the selected printer.

► Select medium size.

NOTICE

Your choice of medium size influences the list of available formats and types. The menu bar shows only the print media supported by the selected printer. When you change the printer, the print media (size, format, type) may change accordingly.

NOTICE

The scale of the printed image can differ from the expected size due to technical tolerances. Therefore it is required to measure on the film only relative to the calipers at the borders of each image. For exact measurements it is recommended to use a lead ruler.

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Format of Medium (Portrait/Landscape)

- ► Click this.
- ⇨ A list of all available medium formats appears; it depends on the selected printer.
- ► Select medium format.

NOTICE

Your choice of medium format influences the list of available templates. The control bar shows only the print media supported by the selected printer. When you change the printer, the print media (size, format, type) may change accordingly.

Type of Medium

- ► Click this.
- ⇨ A list of all the available medium types appears; this list depends on the selected printer.
- ► Select medium type.

Template (Preset or User-defined)

- ► Click this.
- ⇨ A list of all the available templates appears; this list depends on the selected medium format as templates are format-specific.
- ⇨ The following standard templates are available in portrait:

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⇨ The following standard templates are available in landscape:

► Select template.

Tools for Image Handling

Button	Meaning
1 of 1	Counter, shows • The page number of the preview • The numbers of the current pages in the composer
	Add page.
	Delete page.
	Delete selected image from the preview page.
	Go to next page; only active if there are two or more pages in the composer.
	Go to previous page; only active if there are two or more pages in the composer.
	Refresh print preview. When you switch from the review section to the print section, the system may still compose new print preview pages. This button will be active after the new pages are available. By pressing it you can refresh the print preview to examine the newly created pages.

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Button	Meaning
	Print page. If there is more than one page in the composer, the displayed page is printed.
	Print all pages.

Placing an Image in a Viewport

All images of a patient appear in the set of saved images.

- ► Click an image from the set of saved images.
- ► Click the desired field of the viewport.

⇨ If the viewport is empty, the image is placed there.
If there is already an image in the viewport, it is replaced by the new one.
The film and printer settings of the old image are applied to the new image.

Removing an Image from the Viewport

- ► Click image in the viewport.

- ► Click this.

⇨ The selected image is removed from the viewport.

Printing the Image

▷ The preview is OK.

- ► Click this to send it to the printer.

- ► Do any of the following:
- Compose a new page with the images on hand
- Exit the print menu

Tools for Free Composing

Scaling the Image

- ► Open submenu.

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⇨ The following appears:

► Scale the images with these functions:

	Press once: Reduce image by 1%. Press and hold: Reduce image. The percentage is shown below this button.
	Press once: Magnify image by 1%. Press and hold: Magnify image. The percentage is shown below this button.
	Set a percentage and confirm.
	Fit image exactly in the viewport. (This does not exceed 100%.)
	Display image in original size.
	Apply changes on one image to all images.
	Use the same scale for all images on the film.
	Confirm changes and close submenu.
	Cancel changes and exit tool.

Moving an Image

The default visible part of the image is center. This function is usually used on images that are larger than the viewport.

► Open submenu.

► Click the image in the viewport and move the image.

► Confirm changes and close submenu.
or

► Center image again.

Rotating the Image

► Change the image with these functions:

	Rotate image 90° clockwise.
	Rotate image 90° counterclockwise.

Template Editor

How to Modify, Delete, and Create Templates (Advanced User)

Changing an Existing Template

► Call up the **System** section.

► Call up **Settings**.

Print settings ► Call up composer function.

Templates ► Call up list of templates.

► Select template to be changed.

Edit ► Click this.

or

Duplicate ► Duplicate template.

► Select duplicate.

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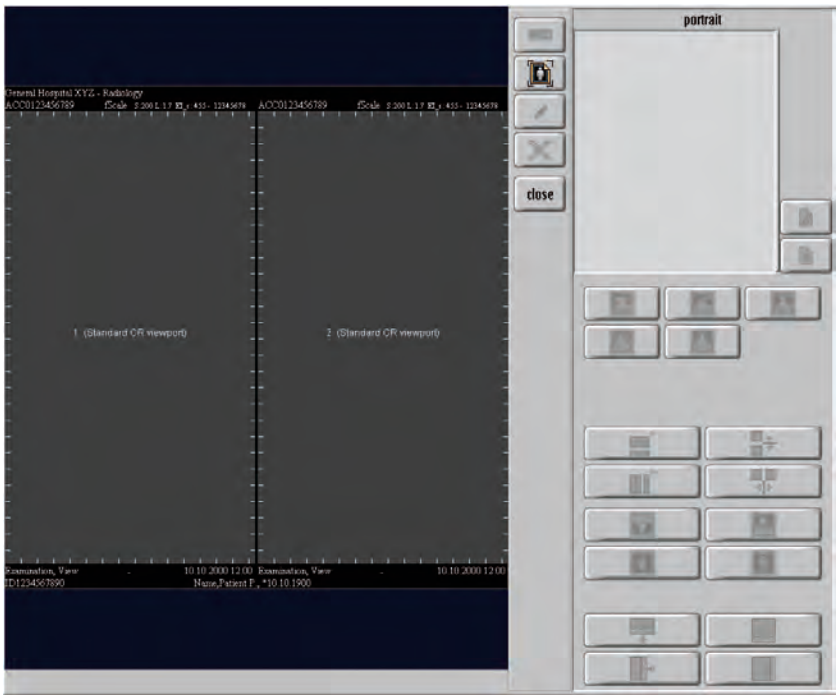
Edit ► Open the template editor.
The selected template appears (Example).



► Change template.

The tools are described in the following chapters.

Close ► Save changes.
If you click **Close** without saving the template, the template will be deleted once you close the template editor.

Creating a New Template

► Call up the **System** section.

► Call up **Settings**.

Print settings ► Call up composer function

Templates ► Call up list of templates

Add ► Add a new template

⇨ A new standard “1×1” template is created and added to the list of templates. You can edit this new template as described above.

Template, Page, Viewport, and Text Box

Every template consists of the following elements:

- A page layout
- One or more viewports
- One or more text boxes for patient information

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Text boxes can be assigned to the whole page or to a viewport.

Examples:

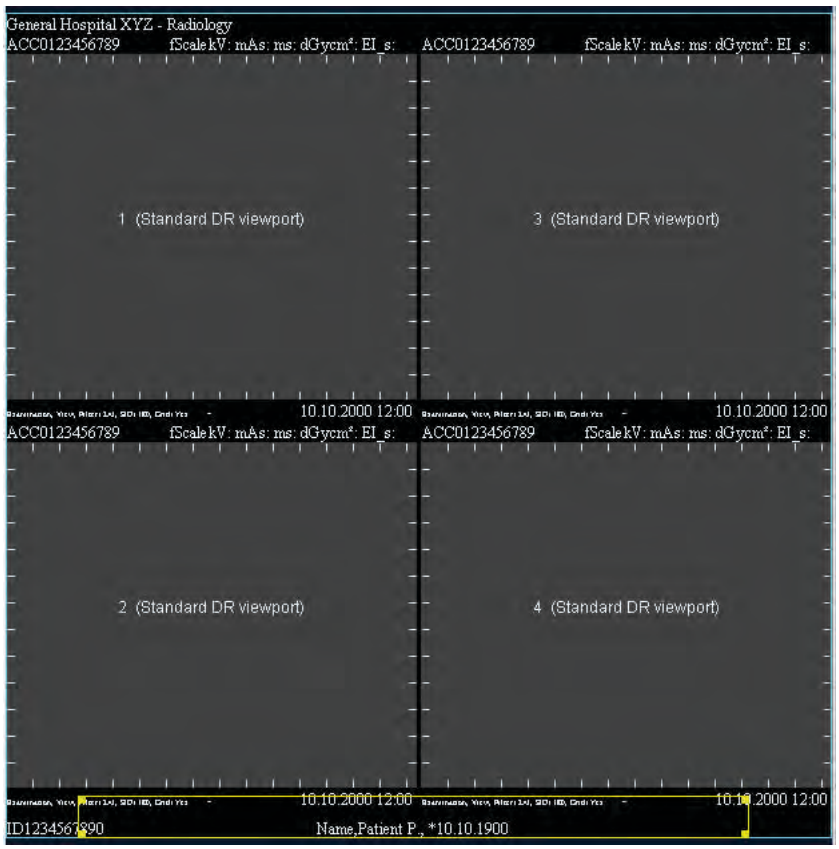

Fig. 22: The text box "Name, Patient P.,..." (yellow frame) is assigned to the whole page (blue frame).

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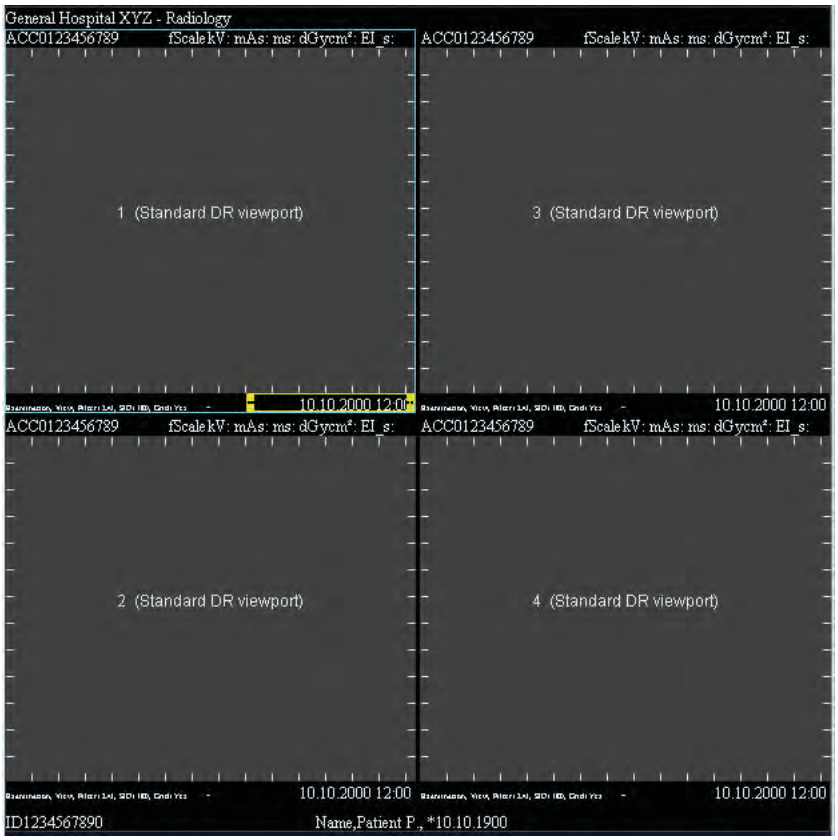

Fig. 23: The text box “10.10.2000 ...” (yellow frame) is assigned to the viewport “1 (Standard DR viewport)” (blue frame).

NOTICE

- Annotations are not part of a template.
- Templates are format-specific. This means that different templates apply for portrait and landscape media.
- A portrait template can never be placed on a medium for landscape and vice versa.
- In the template editor, the template has a layout format; it can be horizontal or vertical and is used for automatic layout when viewports are added or removed.
- All dimensions and positions of a template are relative values and relate to the format of the print medium selected later – given in 1/1000.

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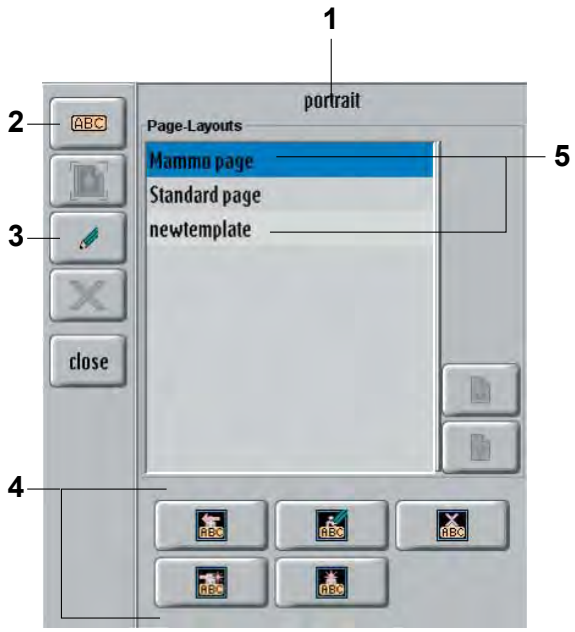
Page Editor

Page Layouts

► Open the “Page-Layouts” window:



1	Layout orientation	
2	Open text editor	
3	Open page editor	
4		Assign page layout to the page
		Edit page layout
		Delete page layout
		Save modification as new page layout
		Create layout
5	Display of the page layouts	

Edit Page Layout

► Click this.

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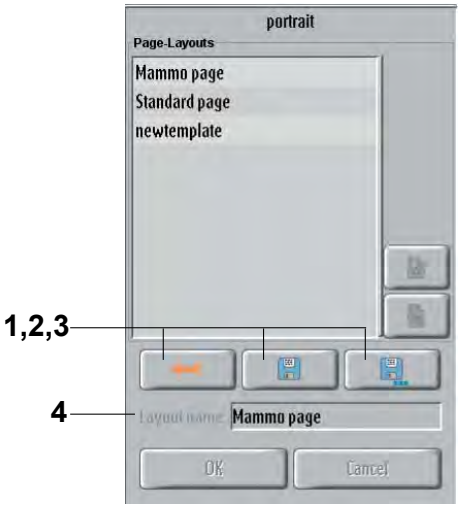
⇨ The following window appears:



1	Return to editing mode
2	Save modifications
3	Save as new page layout
4	Layout name

Edit Page

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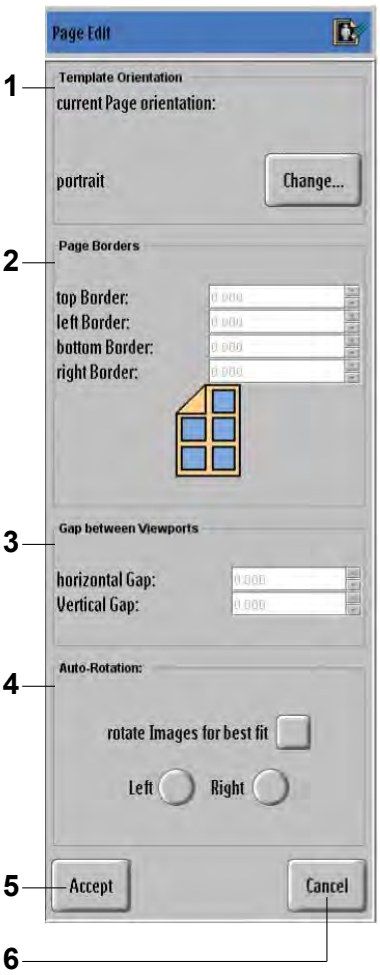
- Open the “Page edit” window:



1	Change the template format The selected template format appears on the top right in the template editor. You can choose between “landscape” and “portrait.”
2	Define template margins The margin values define the area around the template, which are not valid for the viewports. It often makes sense to leave a header or footer free for text information. The values to be entered are relative coordinates – given in 1/1000 of the print medium format.
3	Define the vertical and horizontal spaces between two viewports.
4	If you select auto-rotation, an image made in landscape format will be rotated 90° if it is placed in a portrait viewport.
5	Confirm changes.
6	Undo changes and return to the previous values.

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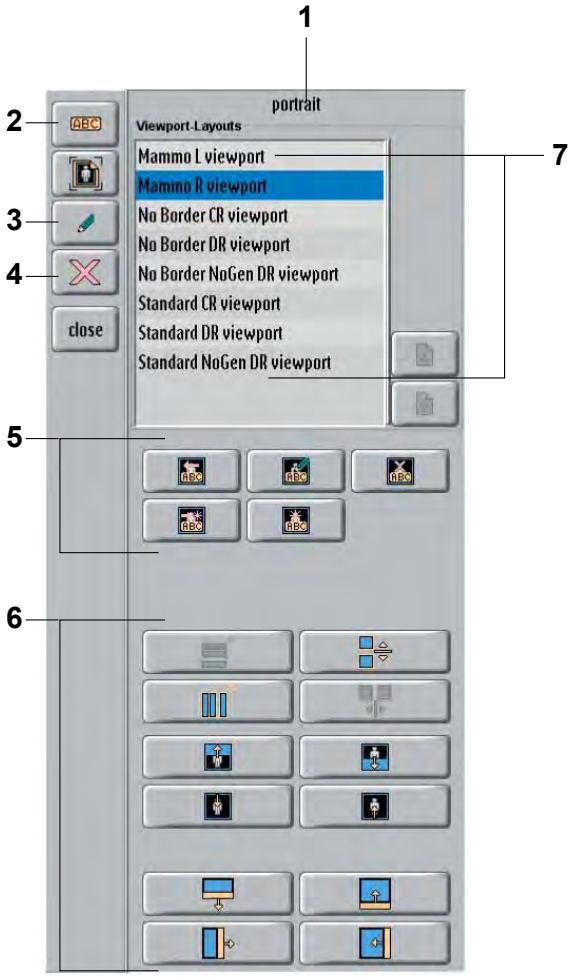
Viewport Editor

Viewport Layouts

► Click a viewport.

⇨ The following window appears:



1	Layout orientation	
2	Open the text editor	
3	Open the viewport editor	
4	Delete the viewport	
5		Assign the layout to the viewport
		Edit the viewport layout
		Delete the viewport layout

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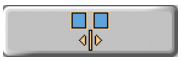
		Add a new viewport layout
		Take over the modifications
6		Add a viewport A new viewport is added at the buttom of the template. The existing viewports are reduced so that all lines are the same height.
		Add a viewport A new viewport is added at the right of the template. The existing viewports are reduced so that all columns are the same width.
		Add a viewport A new viewport is added to the selected column; the column width stays the same. The existing viewports in the selected column are reduced so that all viewports in this column are the same height.
		Add a viewport A new viewport is added to the selected line; the column height stays the same. The existing viewports in the selected line are reduced so that all viewports in this line are the same width.
		Increase the area for the selected viewport toward the top step by step.
		Increase the area for the selected viewport toward the bottom step by step.
		Reduce the area for the selected viewport from the top step by step, to allow space for text outside the image.
		Reduce the selected viewport from the bottom step by step, to allow space for text outside the image.
		Magnify the viewport, line or text box of an image area. The bottom border moves down. The viewport below it changes to the same extent as a result of the top border moving. It is only possible to change the height of individual viewports within the columns. Please note: You cannot move the bottom border of the last viewport in a column downward; you can increase its height by making the viewport above it smaller.
		Reduce the viewport, line or text box of an image area. The bottom border moves up. The viewport below it changes to the same extent as a result of the top border moving. It is only possible to change the height of individual viewports within the columns.

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	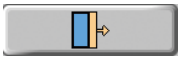	Magnify the viewport, column or text box of an image area. The right border moves to the right. Please note: The right border of the last viewport in a line cannot be moved to the right; you can increase its width by reducing the width of the viewport to its left.
		Reduce the viewport, column or text box of an image area. The right border moves to the left.
7	Display of the viewport layouts	

NOTICE

The template editor is programmed to make optimal use of the space on the print medium. This means, for example, that reducing the viewport height automatically increases the height of the viewports below it in that column.

Editing a Viewport

► Click a viewport.

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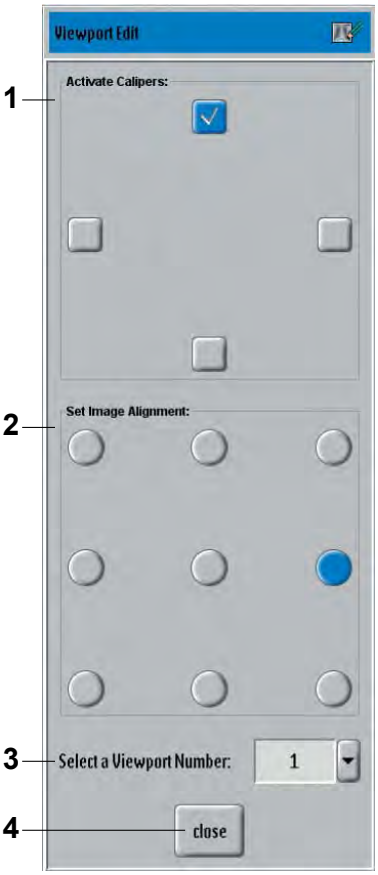
► Click this.
The following appears:



1	Activate/deactivate the calipers you want. All standard templates have four calipers (one per side), which you can activate/deactivate separately.
2	Select the image alignment. By putting the dot in the right place you can align the image as follows: • Aligned right/left • On the top/bottom border • In one of the four corners • Centered.
3	Select the desired viewport number. The selected viewport swaps this number with the viewport which had this number before. All viewports in a template have a reference number which appears in the preview. It defines the print sequence.
4	Close the list.

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Text Box Editor

Text Box

Text boxes are text fields which are automatically filled in from a report or a data set. They can be a page element or a viewport element.

Adding a Text Box to a Template

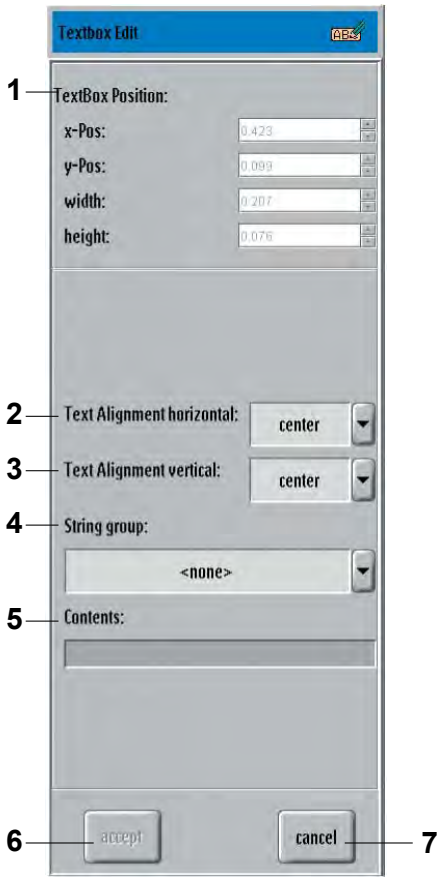
- ► Click the page or viewport to which the text box is to be added.

- ► Click this.
- ► Draw a rectangle.
- ⇨ The text box editor appears.

Editing a Text Box

- ► Select text box.

- ► Click this.
- ⇨ The text box editor appears.



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No.	Meaning
1	Set text box position and size: x-Pos: horizontal positioning of the upper left corner of the text box y-Pos: vertical positioning of the upper left corner of the text box width: width of the text box height: height of the text box
2	Set horizontal positioning of the text in the text box.
3	Set vertical positioning of the text in the text box.
4	Select String group. It contains a list of all preconfigured DICOM data groups, e.g. Patient ID.
5	Contents of the selected DICOM data group, e.g. "DICOM_PATIENT_ID".
6	Confirm changes.
7	Undo changes and return to the previous setting.

NOTICE

The numerical values are the ones in the top left corner of the text box – relative to the elements to which they are added. This means that the coordinates of a text box, which belongs to a viewport and lies outside it, are either negative or larger than 1000.

Change Text Box Size and Position, Link Text Boxes

► Click a text box in the template editor.

⇨ The following window appears:

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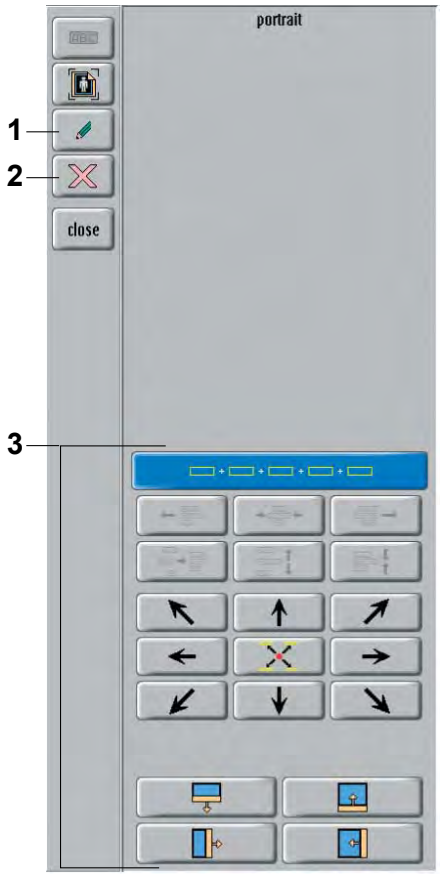

No.	Button	Meaning
1		Open text box editor
2		Delete text box
3		Select more than one text box.
		Align text boxes to the left.
		Center text boxes.
		Align text boxes to the right.
		Merge text boxes.
		Separate text boxes step by step.
		Merge text boxes step by step.
		Move text box toward top left step by step; in small increments using Ctrl key.

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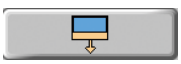
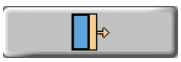
No.	Button	Meaning
		Move text box toward top step by step; in small increments using Ctrl key.
		Move text box toward top right step by step; in small increments using Ctrl key.
		Move text box toward left step by step; in small increments using Ctrl key.
		Move text box toward right step by step; in small increments using Ctrl key.
		Move text box toward bottom left step by step; in small increments using Ctrl key.
		Move text box toward bottom step by step; in small increments using Ctrl key.
		Move text box toward bottom right step by step; in small increments using Ctrl key.
		When used in conjunction with one of the 8 direction keys, this button places the text box at the corresponding border or in the corresponding corner.
		Enlarge text box. The bottom border moves down. Please note: You cannot move the bottom border of the last text box in a column downward.
		Reduce text box. The bottom border moves up.
		Enlarge text box. The right border moves to the right.
		Reduce text box. The right border moves to the left.

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12 System Administration and Customization

System Section

All customization functions and all service functions are in the System section.
Also, you can turn off and restart the system in the System section.

Certain functions only the administrator may operate. Only use the System section when you

- want to turn off the system,
- want to work with print or export functions or
- are trained to use further functions.

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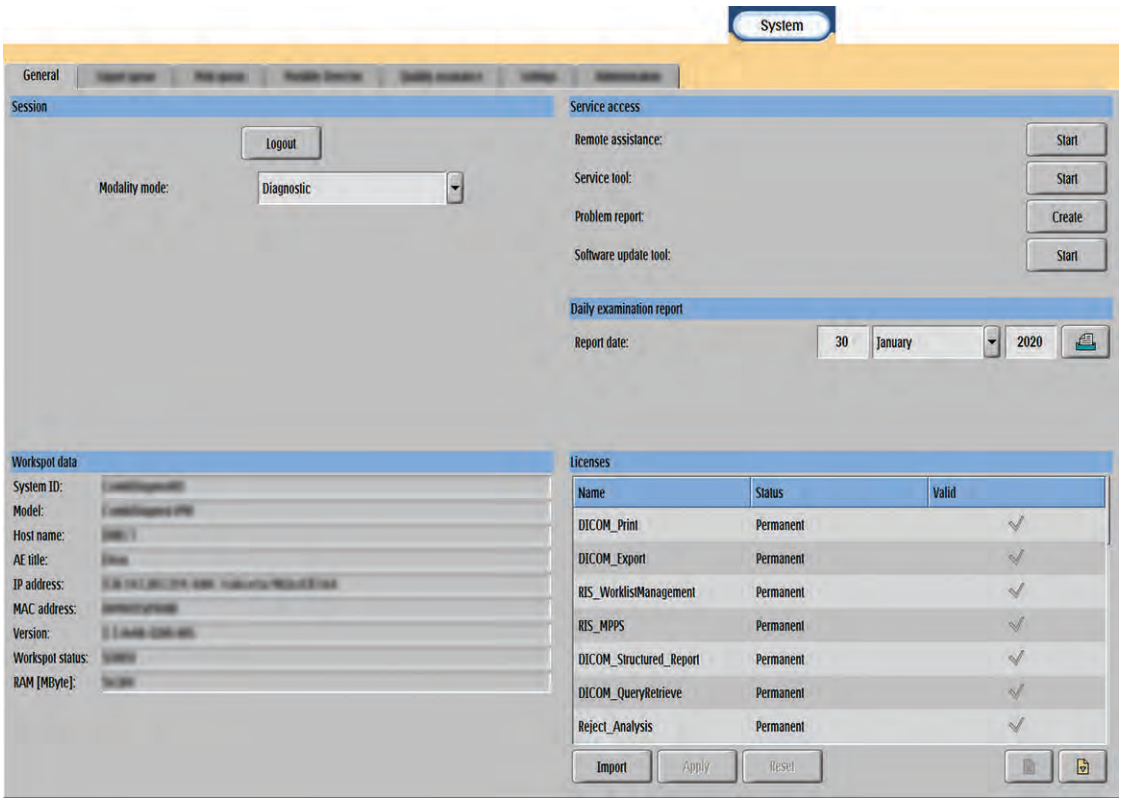
General



Logout	User logout; system remains powered.
Remote service access	Enable/disable remote service.
Remote assistance	Start a “Look Over The Shoulder/Take Over (LOTS/TO)” session.
Service tool	For service and advanced users (administrators) only.
Problem report	Save a problem report in case of a system error or unusual system behavior (first signs of a defect). The system displays a screen for you to enter a problem description and other details.
Software Update Tool	Access to software updates.
Daily examination report (optional)	Print daily dose report for all examinations.
Modality mode	Select diagnostic or quality assurance mode. The system indicates, with a message, if the detector must be calibrated. In order to calibrate the detector, select the quality assurance mode and proceed as described in the section “Detector calibration”.
Workspot data	Information about the system and software.
License status	Information about the license status.
Import	Import licenses.

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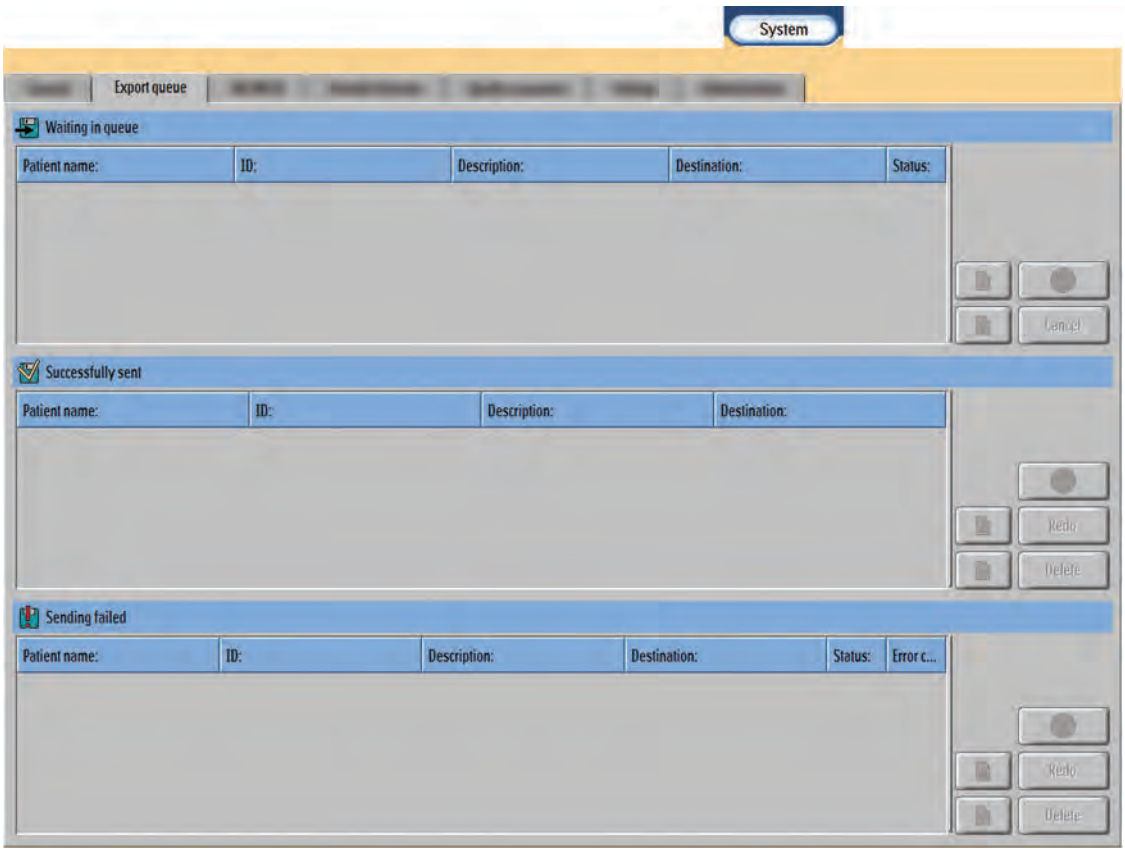
Export Queue



Waiting in queue	Jobs that still have to be exported.
Successfully sent	Jobs that have been successfully exported.
Sending failed	Jobs that were aborted or failed to export.
Cancel	Cancel job.
Redo	Redo job.
Delete	Delete job.
	Further information about the job.

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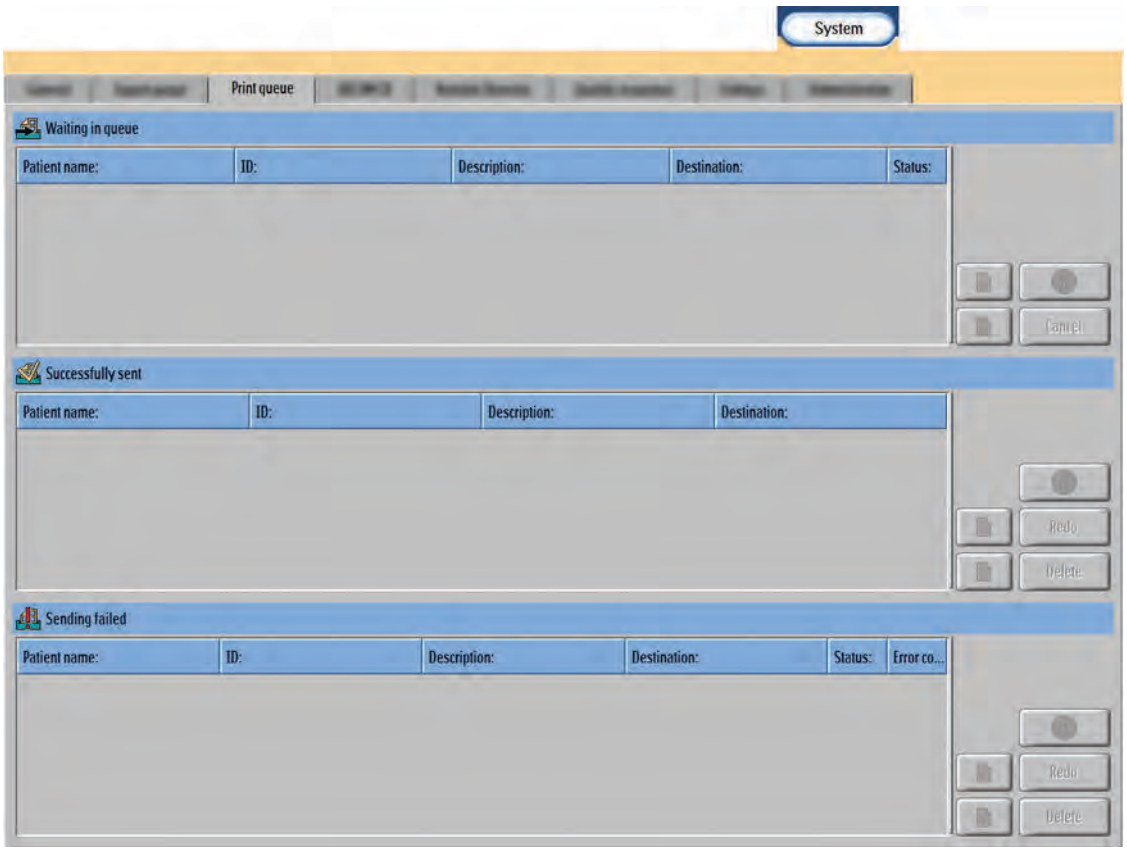
Print Queue



Waiting in queue	Jobs that still have to be printed.
Successfully sent	Jobs that have been successfully printed.
Sending failed	Jobs that were aborted or failed to print.
Cancel	Cancel job.
Redo	Redo job.
Delete	Delete job.
	Further information about the job.

The Print function is available for radiography images only.

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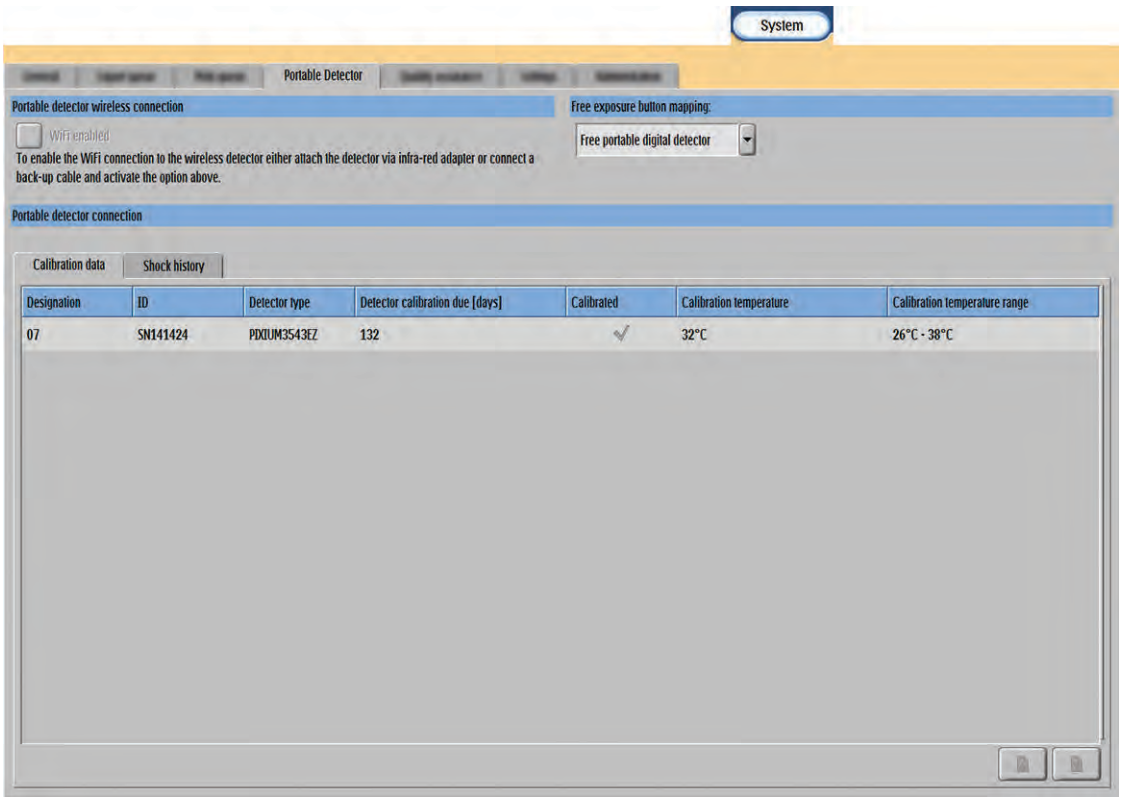
Portable Detector



Portable detector wireless connection	Switch the wireless connection of the portable detector on or off.
Free exposure button mapping	Map the free exposure button on the control grip to **Free portable digital detector** or **Free cassette**.
Portable detector connection (The table lists all portable detectors that have ever been attached to this system by the customer service.)	**Calibration data**: • **Designation** - assigned detector number • **ID** - detector serial number • **Calibration due [days]** - time to the next detector calibration (in days) • **Calibrated** - calibration status • **Calibration Temperature** – temperature during calibration • **Calibration temperature range** – valid temperature range for usage **Shock history**: • **Designation** – assigned detector number • **ID** – detector serial number • **Detector type** – detector type • **Time of shock event** – day and exact time of the shock event

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- **Severity** – indication of the severity of the shock (Medium shock or Heavy shock)
- **Confirmation time of shock event** – day and exact time of the confirmation of the shock event
- **Confirmed by** – user name

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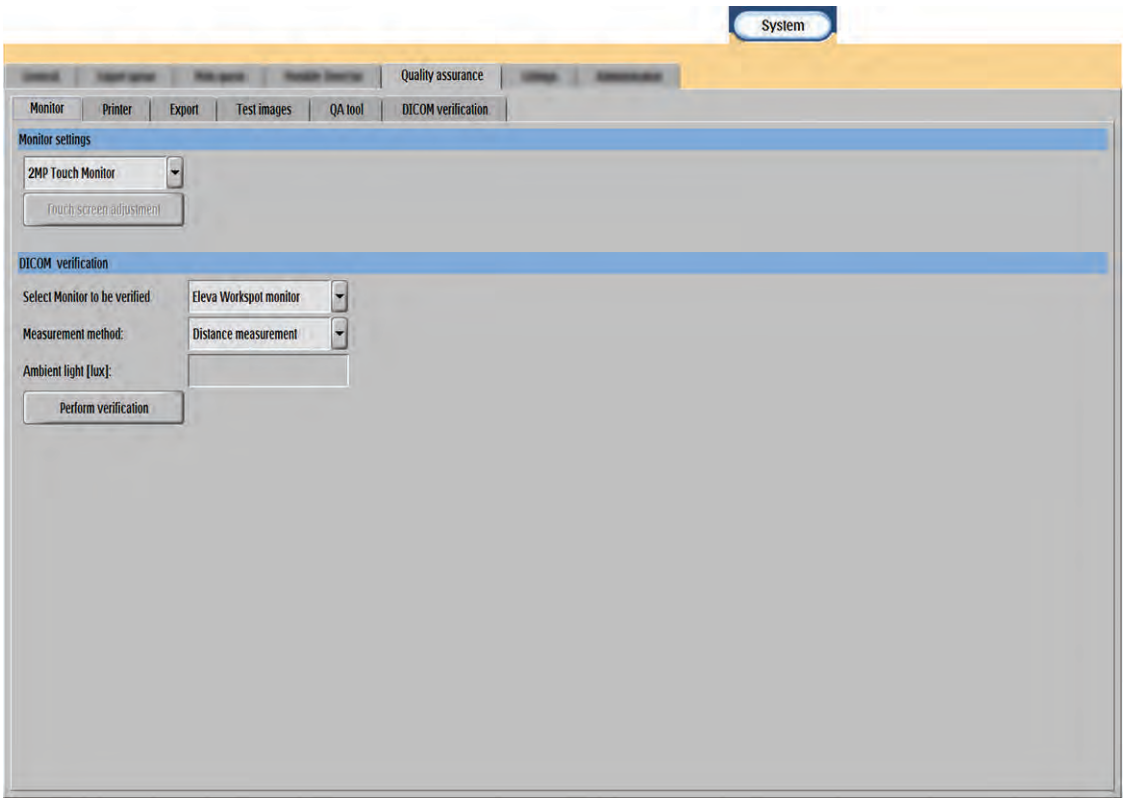
Quality Assurance



Monitor	Select the monitor type. Select the monitor and perform the verification. This function verifies the luminance of the monitor according to DICOM GSDF (Grayscale Standard Display Function). The administrator or customer service performs the verification by using optical measurement equipment.
Printer	Select and calibrate the printer.
Export	Export settings and calibration.
Test images	Load and manage test images. As well as the last 5 images are saved here from the detector (raw data). These can be moved to a patient folder using the move tool.
QA tool	Analyze confirmed and rejected images.
DICOM verification	Verify connectivity of configured DICOM nodes.

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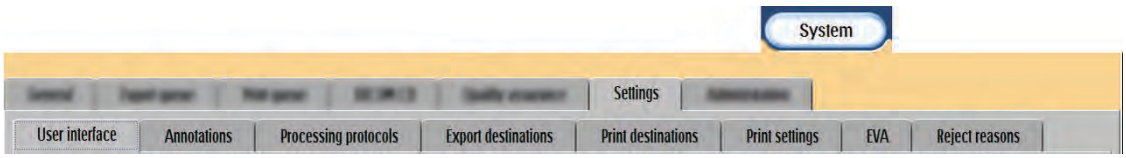
Settings



User interface	• Define general functions for the workflow. • Define general display of the examination list. • Define image display. • Change joystick behavior (monitor oriented). • Define auto logout. • Switch virtual keyboard on/off.
Control handle display(optional)	Only available with Ceiling Suspension CSM3 (optional) • Display the patient camera in the **Examination** section. • Display the patient camera in remote session. • Allow all users to change the collimation restriction.
Annotations	Enable or disable automatic markers for radiography and fluoroscopy images. Predefine annotations and define their size.
Processing protocols	Delete or change image processing protocols according to different sorting criteria.
Export destinations	Assign (different) export destinations to export schemes.
Print destinations	Assign different print formats to different printers (for radiography images only).
Print settings	Manage print templates (for radiography images only).
EVA	• Manage workflow parameters. • Manage examination parameters. • Manage RIS codes.
Reject reasons	Edit the drop-down list for reject reasons. The list of reject reasons appears after rejecting an image.

NOTICE

Exit the EVA tool always directly after usage to prevent unauthorized access.

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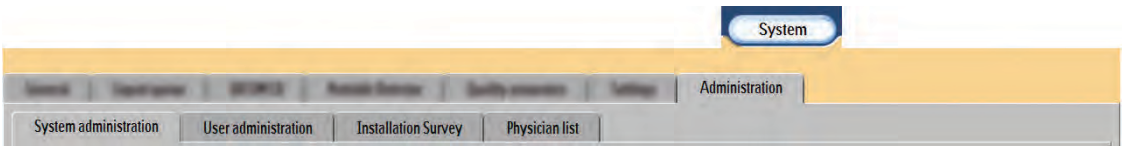
Administration



System administration	Set date, time, and language.
User administration	Enter/delete user accounts and modify administrator account.
Installation Survey	History of installation processes.
Physician list	Enter/modify physician names. The list then appears in the Patient and Examination Scheduling.

NOTICE

For security reasons, create or change passwords according to the following rules:

- The password must be different from previously used passwords.
- The password can be changed only once within 24 hours.

The password must contain the following:

- At least eight characters
- At least one upper case letter
- At least one lower case letter
- At least one numeric digit
- At least one special character

The password expires after 60 days.
The user account locks after three failed logins. The administrator can unlock the user account.

Changing the Operator's Name

Before acquiring an image, the highlighted view or examination can be linked to another operator's name. To save time, the name of the operator can be changed without logging out of the system.
As soon as an image has been acquired, the operator's name is displayed below the image and it is also used in the Quality Assurance Tool.

Configuring

► Select the System section.

► Select **Settings** and then **User Interface**.

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► Click this to enable the function.

How to Work with User Accounts Created in Advance

▷ Several user accounts are created. This can be done in the System section. Go to **Administration** and then **User administration**.
When you have enabled the function, a drop-down menu appears as soon as you go to the Examination section.

► Click the arrow to select another operator from the operator's list.

⇨ All further images and changes on the system are connected to the latest operator selected.

How to Work Without User Accounts Created in Advance

▷ You are in the Examination section

► Click the operator's name field.

► Type your operator's name.

► To add the name to the list, press Enter.

► You can enter more operator's names, if needed.

⇨ All further images and changes on the system are connected to the latest user selected.

⇨ The names are stored in the drop-down menu until a restart of the system is performed.

Remote Assistance

WARNING

As soon as you start remote assistance, do not switch off the system.

Data might get lost.

As soon as you start remote assistance, do not operate the system with patients.

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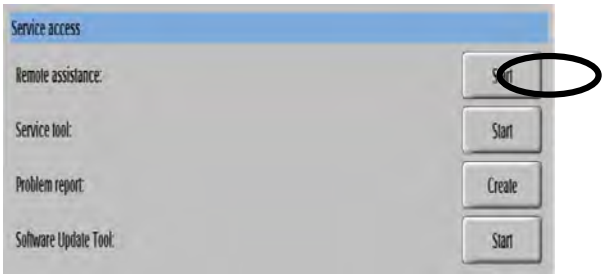
Start... ► Click this to start **Remote assistance**.



⇨ A message appears, that informs you about the rights of access. You can agree or exit the session.

► If you agree, click **Enable Remote Access**.

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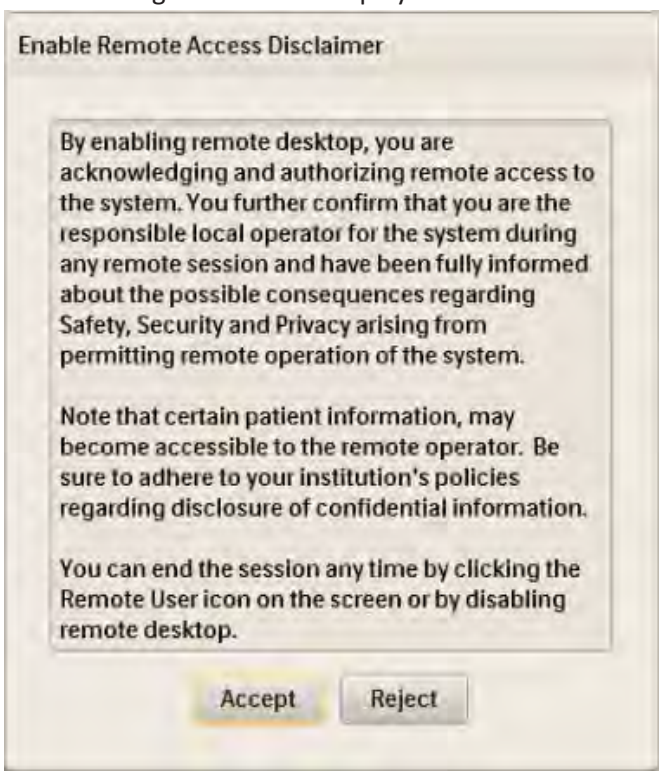
⇨ The following disclaimer is displayed:



► Click **Accept**.

The status in the info box **Remote Access Enabled** changes to **Connected**.

DICOM Structured Dose Report (Optional)

The normal user can export the patient radiation exposure information in a structured report DICOM standard format (DICOM SR).
The system sends the DICOM Structured Dose Report automatically when an examination is completed.
When the export fails, a message appears; this message does not need to be confirmed.

Please note:

- To set up a DICOM SR node, contact the customer service.
- In total three nodes can be set up that will receive the reports in parallel.
- The images are sent to the PACS independently of the DICOM Structured Dose Report. So the images might be successfully exported to the PACS, but not the DICOM Structured Dose Report.
  When the export of the DICOM Structured Dose Report has failed, check the following:

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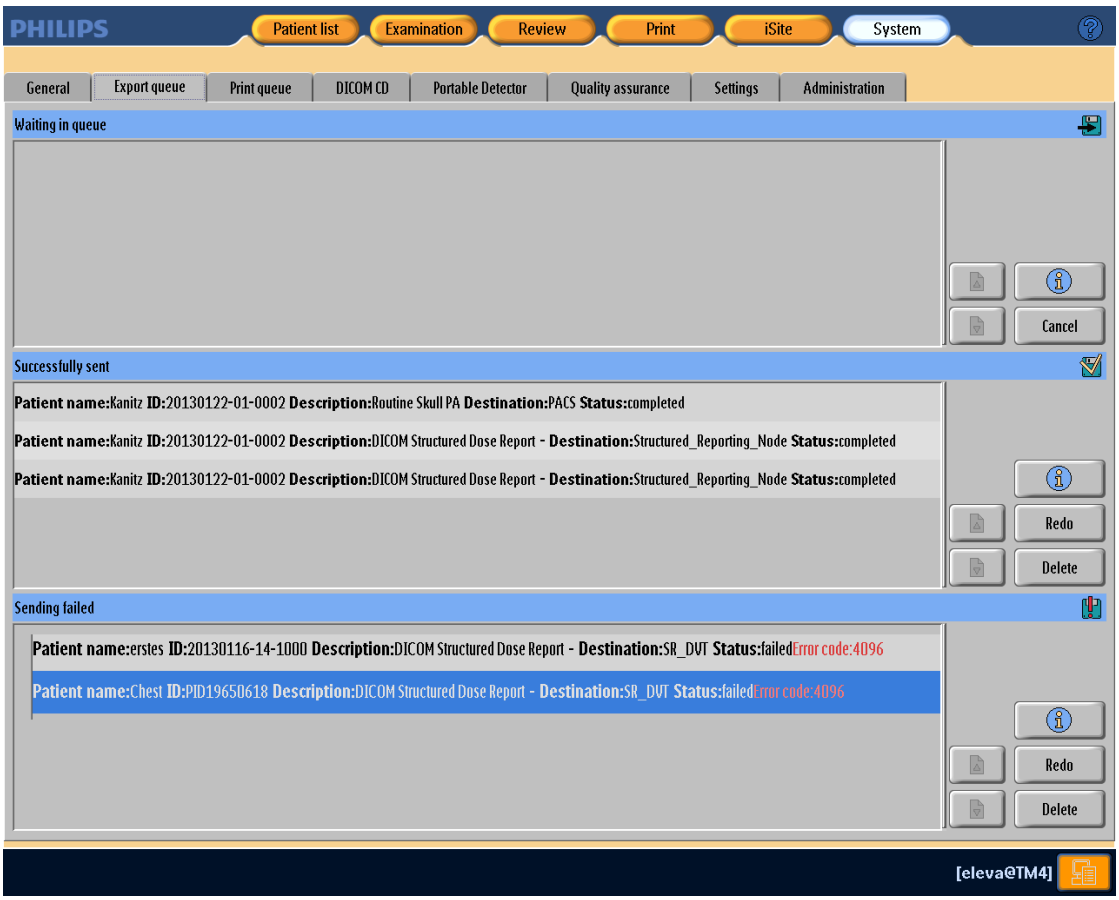
  - The status of the DICOM Structured Dose Report under **System/Export Queue/Sending Failed**
  - The status of the node under **Quality Assurance/Dicom Verification**
- To avoid loss of information, regularly check the status of an exported DICOM Structured Dose Report under **System/Export Queue/Sending Failed**.

To resend the DICOM Structured Dose Report, select the report from the **Sending Failed** list and click **Redo**.



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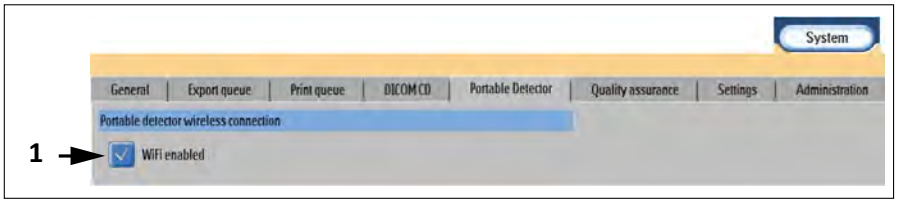
Adjusting the SkyPlate

Enabling/Disabling the Wireless Connection

Portable detector

► Select this.
The following appears:



► Click the button (1) to enable/disable the WiFi connection.

NOTICE

When the WiFi connection is disabled you must use the backup cable.

When the WiFi connection is disabled and you want to enable the WiFi connection again, do one of the following:

- Attach the detector via infra-red adapter.
- Connect the backup cable and click the button to enable the WiFi connection.

Resetting the Image Processing Protocols

In case you have overwritten an image processing protocol, you can reset the image processing protocols.

► Go to **Settings** in the **System** section.

► Select **Processing protocols**.

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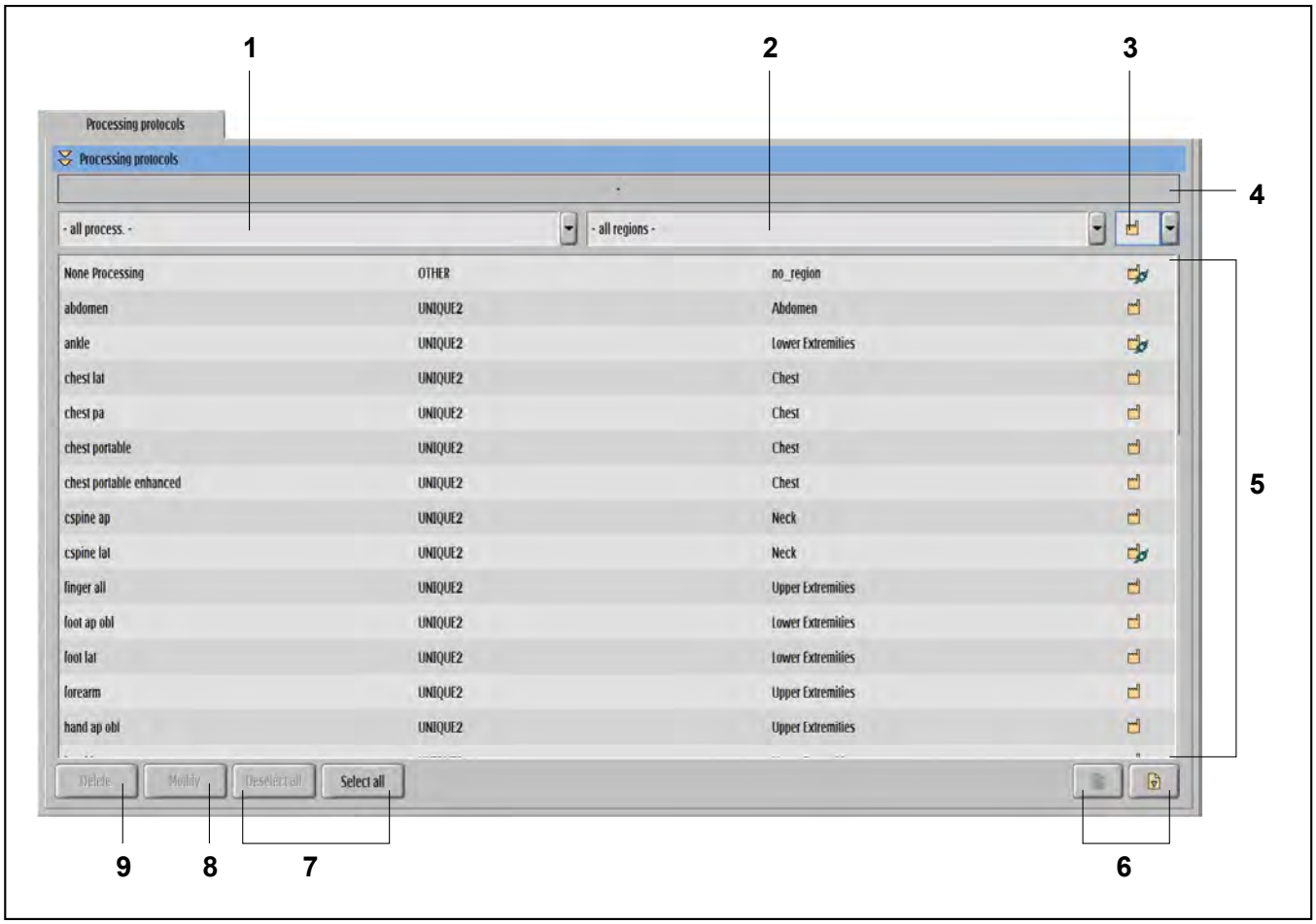

No.	Meaning
	You can set different filters to modify the list of image processing protocols:
1	You can choose between different processings: – All processings – Other – Unique2
2	You can choose between different regions: – All regions – Service – No region – Chest – Abdomen – ...
3	You can set the following filters here:
	 All processing protocols

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No.	Meaning	
		Preset image processing protocols from factory
		User defined image processing protocols
4	Selected image processing protocols	
5	List of image processing protocols according to the chosen filters	
6	Scroll through the list	
7	Select or deselect all listed/displayed protocols	
8	Modify the anatomic region for the selected protocols	
9	Delete the selected protocols	

Reject Reasons

Enabling/Disabling the Reject Reasons (Advanced User)

If the function is enabled, the system asks for a reason when you reject an image.

- ► Go to **Settings** in the **System** section.
- ► Select **User interface**.
- ► Click the button **Ask for reject reason** to enable/disable the reject reasons.

Configuring the Reject Reasons (Advanced User)

- ► Go to **Settings** in the **System** section.
- ► Select **Reject reasons**.

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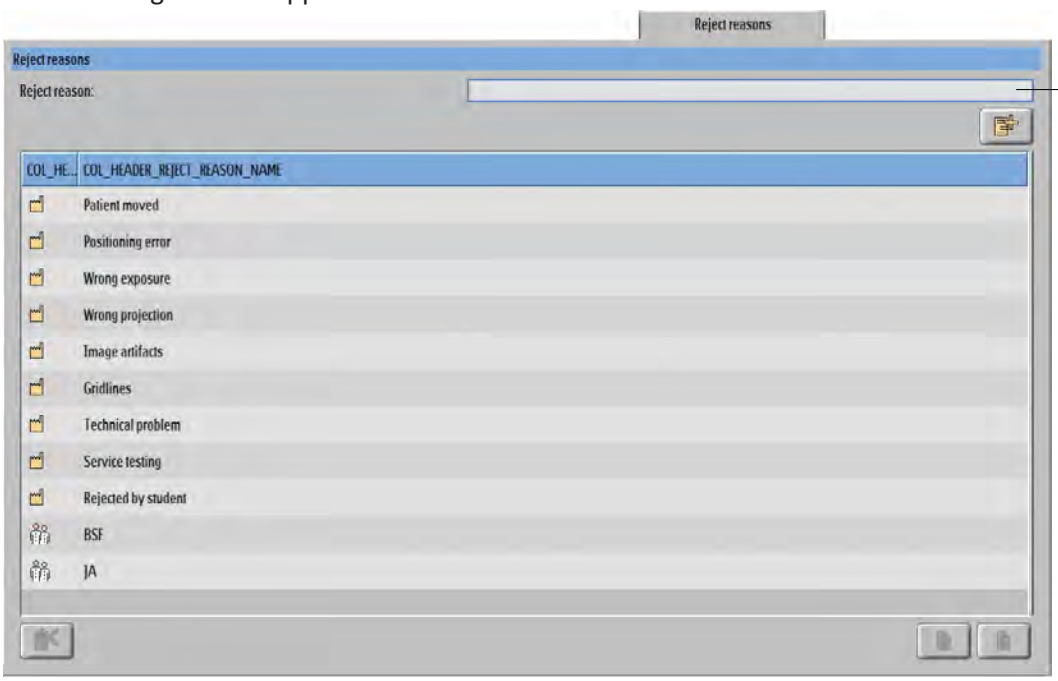
⇨ The following window appears:



There are two types of reject reasons:

	Preset from factory
	User defined

Adding a Reject Reason

► Enter the name of the new reject reason in the field **Reject reason** (1).

► Click this to add the new reject reason to the list.

⇨ The new reject reason is added to the list.

Deleting a Reject Reason

► Select the reject reason that you want to delete.

► Click this.

► Confirm the user guidance.

⇨ The reject reason is deleted from the list.

Changing the Order of the Reject Reasons

► Select a reject reason.

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► Click this to move the reject reason up.

Or

► Click this to move the reject reason down.

⇨ The order of the reject reasons is modified.

Sending Rejected Images to the PACS

Automatically

► Go to **Settings** in the **System** section.

► Select **User interface**.

► Disable the function **Do not export image upon reject**.

⇨ Rejected images are automatically sent to the PACS (after you have completed the examination).

Manually

► Go to **Settings** in the **System** section.

► Select **User interface**.

► Enable the function **Do not export image upon reject**.

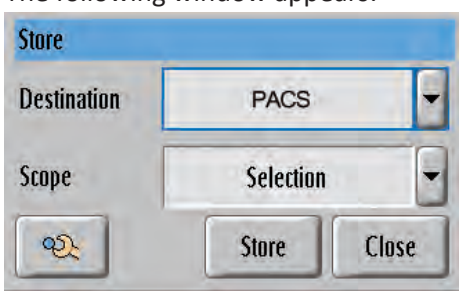
⇨ Rejected images are not automatically sent to the PACS. They must be sent to the PACS manually.

► Go to the **Review** section.

► Click the rejected image that you want to send to the PACS.

► Click this.

⇨ The following window appears:



► Select the destination (PACS, web product, etc…).

► Select the scope:
– **Selection**: Sends only the selected image to the destination.
– **All**: Sends all images to the destination including the rejected ones.

► Click this again to send the images.

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⇨ The rejected images are sent to the PACS.

Locating Missing Images

If an image is missing from your patient examination section, the last 5 images are saved in the system and can be moved to the correct patient. You can check the system for these images as long as the system has not been restarted. This is applicable for radiography images only.

- ► Go to **System**.
- ► Go to **Quality Assurance**.
- ► Go to **Test images**.
- ► Click **Load images**.This may take a while.
- ► Go to **Examination**.
- ► Select **Test images**.
- ► Open the Examination.
- ► Scroll down to the examination titled
  [Test Images]
  Last Images
- ► Scroll down to see the last few images stored by the system. These appear as raw data or unprocessed images.

- ► Move the missing image to the correct patient examination by using the move function.

NOTICE

Moving the image to the correct examination will correct the orientation, automatic annotations, image processing, and examination name and view name that are sent to the PACS.

Problem Report

This function stores a comprehensive data set which can be used for fault finding.

NOTICE

Detailed logs are saved only for the last one to two hours. After that, only some rough data can be recalled. Therefore, you should request a problem report within one hour after the problem occured.

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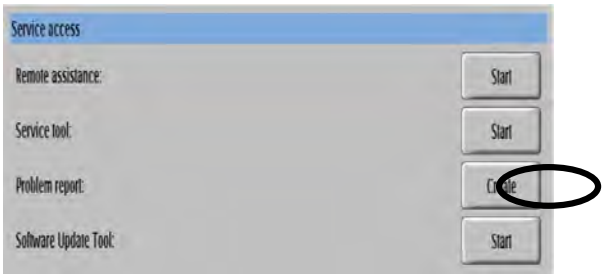
NOTICE

When you request a problem report, the system needs approximately 5 minutes to gather all information. During that time, you cannot use the system.

NOTICE

The system always stores the last ten problem reports. When you create more than ten problem reports, older files are overwritten.

- ► Go to **General** in the **System** section.
- ► Click **Create**.



⇨ A window appears that asks you to provide some information.

- ► Enter a short problem description, a contact name, a contact number and the date.
- ► Confirm with **OK**.
  You can cancel the operation by clicking **Cancel**.

⇨ The system stores a system backup for the service engineer and additional data, for example:
  – Battery status (wireless detector)
  – Detector calibration files
  – EPX database backup
  – All image data of the last 5 images.

NOTICE

Alternatively, you can request the problem report by pressing CTRL + ALT + P.

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13 Quality Control

QA Tool (Optional)

How to Access the QA Data via Customer Network

You can access the QA data from another PC in the network without interfering with the patient workflow.
To ensure patient privacy the access to the QA data is password protected. The data transmission over the network is secured with the Secured File Transfer Protocol (SFTP).
To activate the SFTP access and to set up a password, contact customer service.
Make sure that a software that supports the SFTP protocol, for example, PSFTP or FileZilla, is installed on the other PC in the network.

NOTICE

The data accessed via SFTP may contain electronic protected health information (ePHI). Therefore the SFTP password shall remain under the control of the customer. The Philips service engineer shall not know that password except if explicitly decided by the customer.

NOTICE

For security reasons, create or change SFTP passwords according to the following rules.
The password must contain the following:

- At least 14 characters
- At least one capital letter
- At least one digit
- At least one special character

Export the QA Data

► Open the QA tool on the Eleva Workspot.

► Select the data you want to export.

► Export the data to “F:/transfer/RatData”.

Access to the QA Data from Another PC in the Network

▷ Access to an SFTP client must be available on the PC.

► Open the SFTP client on the PC.

► Type in the IP address of the system that holds the QA data you have exported.

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- ► Type in the SFTP port number **52222**.
- ► Type in the username **QADataUser**.
- ► Type in the password.

⇨ The data previously exported on the Eleva Workspot are available.

The content of the QA data exported depends on how the advanced user has configured the QA tool.

Introduction

Scope

The Quality Assurance Tool (QA Tool) provides statistic analyses for radiography images that can be used for

- Reportings, e.g. for public authorities.
- Internal quality control.
- Improving the workflow.

The following sections assist the user to

- Understand how to feed the QA Tool with input data from clinical routine work.
- Understand what the tool is able to show and how.
- Be able to configure the visual output of the tool.
- Be able to perform custom defined queries and statistics.
- Be able to export data sets and statistics.
- Be able to store and further analyze exported data, e.g. with Microsoft Excel.
- Be able to retrieve data remotely for use.

Restricted Use

This Quality Assurance Tool is available for advanced users only.

The tool is only visible if you hold a license for this tool.

Only radiography images can be analyzed.

NOTICE

Exit the QA tool always directly after usage to prevent unauthorized access.

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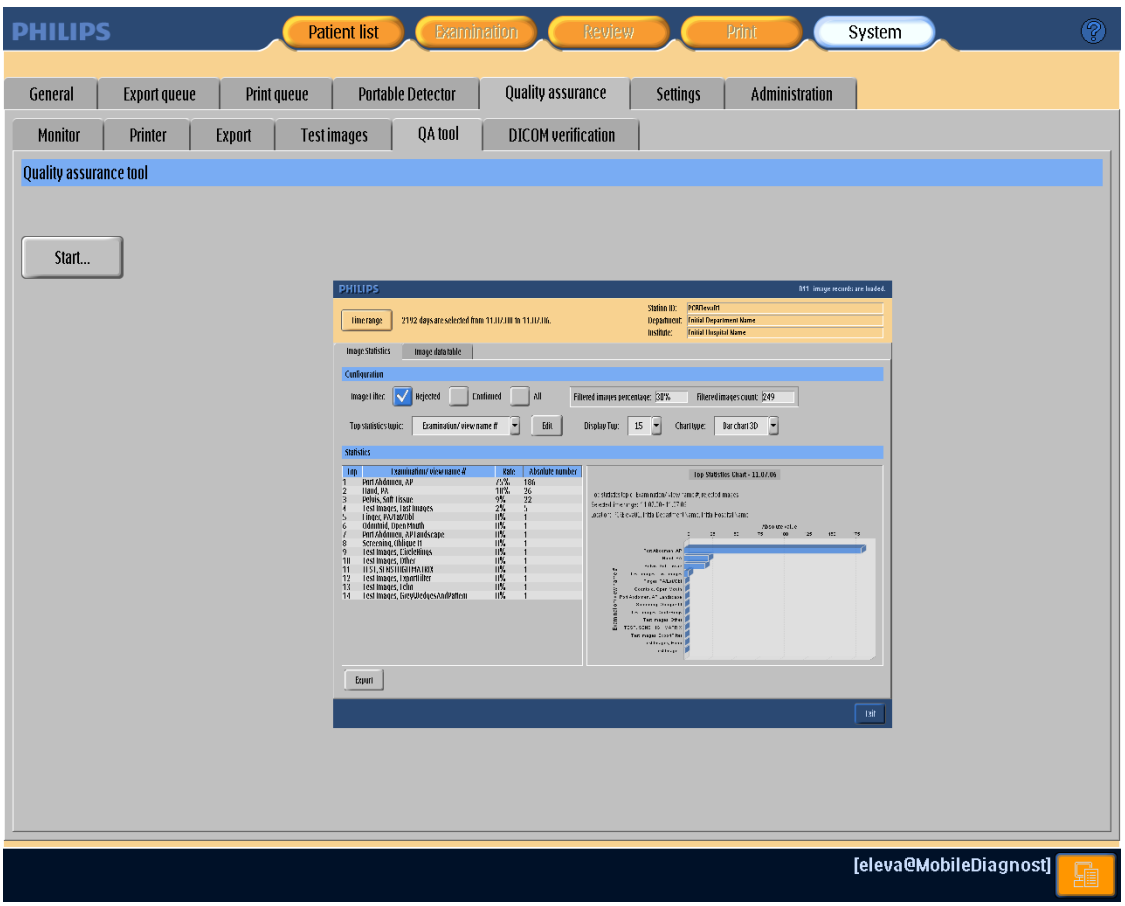
Overview QA Tool

Start the QA Tool

You will find the QA tool in the System section.

Quality assurance ► Select this.

QA tool ► Select this.
The following appears:



Start... ► Click this.

NOTICE

Exit the QA tool always directly after usage to prevent unauthorized access.

Exit the QA Tool

Exit ► Click this.

⇨ You will return to the System section.

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Legend

No.	Description
1	Set time range.
2	Show selected time range.
3	Select a statistic tool. When you click one of the 3 buttons, the corresponding statistic tool appears.
4	Number of image records loaded for selected time range.
5	General information

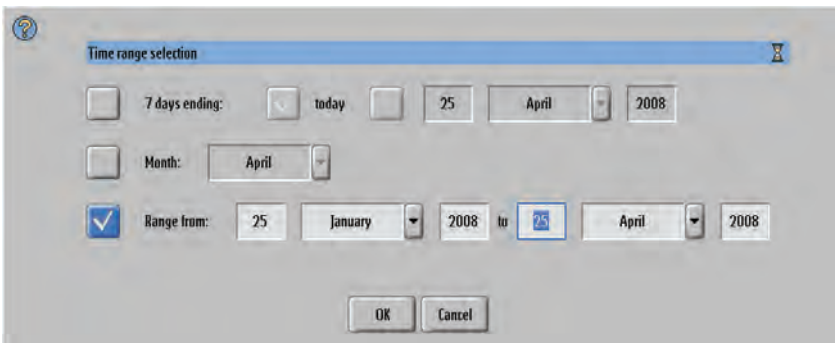
Set Time Range

NOTICE

Only images within this set time range will be analyzed in the QA tool.

Time range

► Press this.
The following appears:



► Set the time range as follows:

- Choose 7 days by defining the last day
- Select a month

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- Define a customized period of time

OK ► Confirm the selection

or

Cancel ► Cancel the selection.

Customize List of Analyzed Values

In the QA Tool predefined values are set for analysis in each statistic tool. You can change the list to suit your purposes.

Open the list. Select “System” - “Quality Assurance” - “QA tool” - “Image statistics” - “Topics”

Example:

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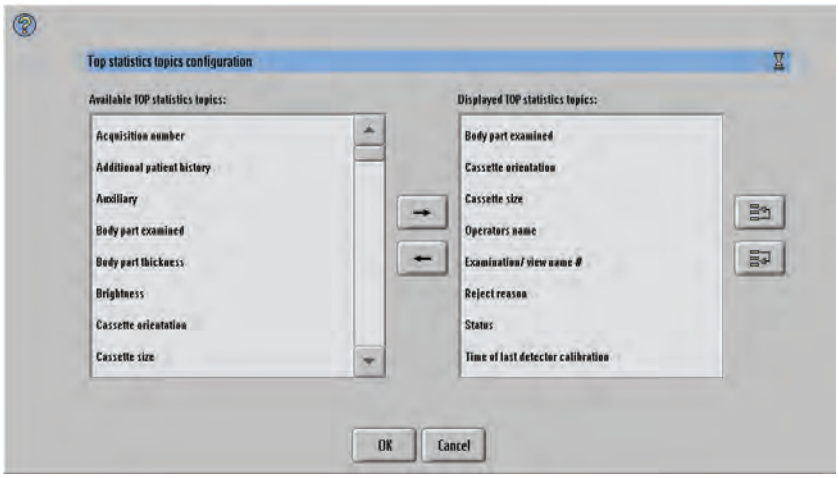

Button	Function
The left column shows all available values. The right column shows the values that are displayed in the table.	
	Add value to the list. ► Select value in the left column. ► Click button. The value is added to the list.
	Remove value from the list. ► Select value in the right column. ► Click button. The value is removed from the list.
You can decide here in which order the values are displayed in the analysis. The values are ordered in the table from left to right. You can change the order with the two following buttons:	
	Move up a value in the list. ► Select value in the right column. ► Click button to move up the value.
	Move down a value in the list. ► Select value in the right column. ► Click button to move down the value.
OK	Confirm changes.
Cancel	Cancel

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Personal Data

NOTICE

The QA tool can be configured in such a way that the export data contains sensitive information including patient, clinician, and other personal data. In the course of an export the transfer is not protected by a secure protocol. If required, the QA Tool might be customized by the application specialist/advanced user not to contain privacy protected data.

Processing of Stored Files

NOTICE

The exported statistics may contain confidential information and not fully de-identified personal data. Take appropriate measures to protect the information and prevent disclosure of this information to unauthorized persons.

Export The generated statistics can be exported and then stored on the service partition, see chapters Export statistics.

Working with Microsoft Excel

You should have basic knowledge of working with Microsoft Excel.

- Open .csv file with MS Excel.
- Select whole table.
- Auto adjust cells for better graphical presentation:
  Double click separation line between column headers.

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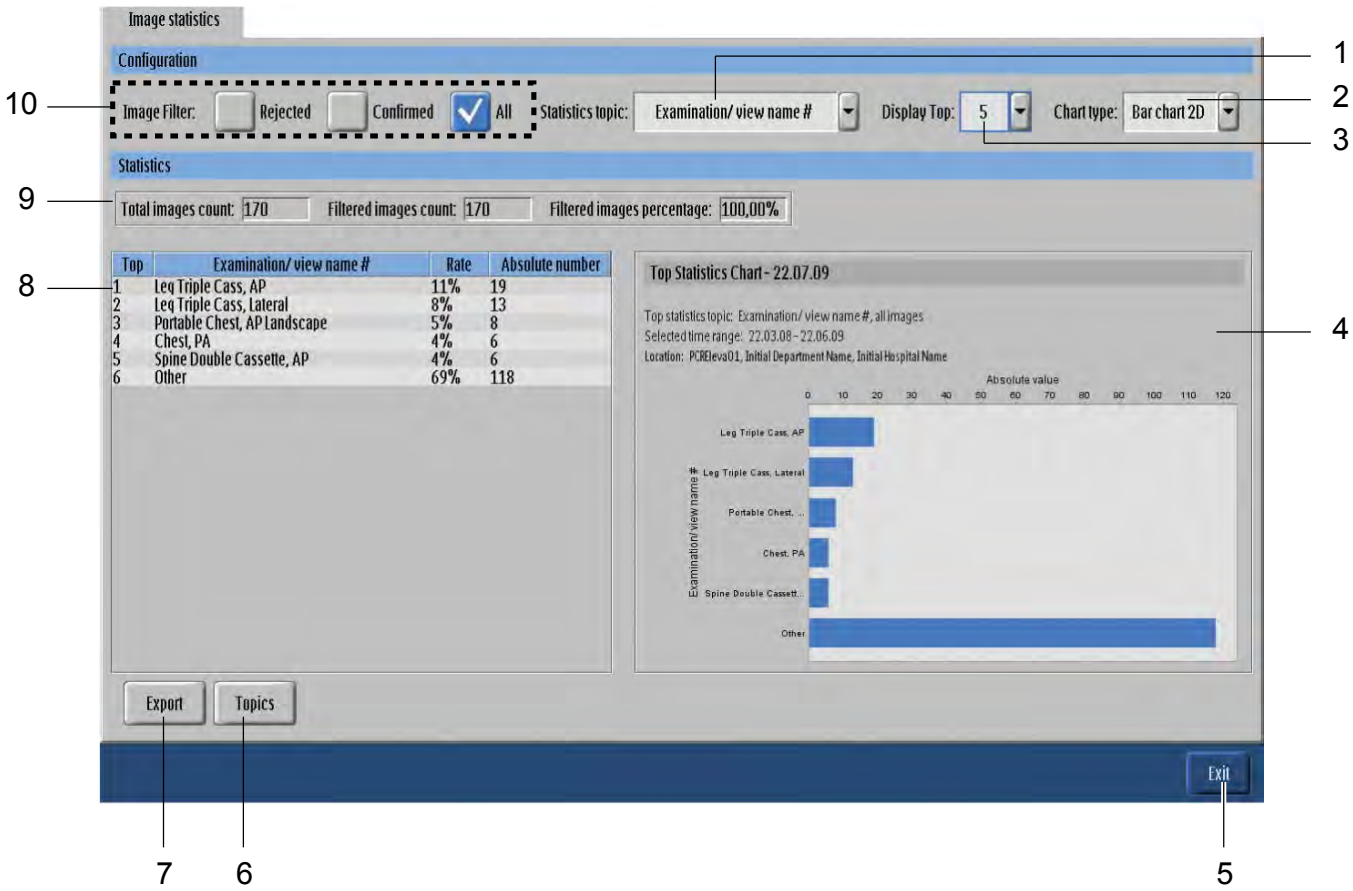
Generate Image Statistics

Legend



No.	Description
1	Select statistics topic for table and chart (only one topic can be chosen at the same time).
2	Select chart type.
3	Set limit of displayed items.
4	Show chart of analyzed data. In this detail the chart and the following settings are shown: • Top statistics topic and selected image filter • Selected time range • Location (station ID, department name, institute name)
5	Exit QA tool.
6	Customize statistics topic list.
7	Export image statistics.

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No.	Description
8	Show table of analyzed data (according to the predefined settings). The following items are listed: • The top number. • The statistics topic. • The percentages of the rate. The data are listed in descending order. • The absolute numbers.
9	Number of analyzed data: • The total images number of analyzed images • The number of filtered images (filter: rejected, confirmed, all) • The percentage of the filtered images
10	Set image filter.

Set Image Filter

Set one of the following image filters to modify the statistic:

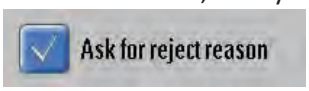
Rejected	All rejected images will be analyzed.
Confirmed	All confirmed images will be analyzed.
All	All rejected and confirmed images will be analyzed.

Rejected Images

Configuring

You can give a reason when rejecting the image during the examination workflow. This can be configured as follows:

- ► Select the System section.
- ► Select **Settings** and then **User Interface**.
- ► If this is selected, the system will ask for a reason in case of reject.



Rejecting

When rejecting an image the following screen appears:

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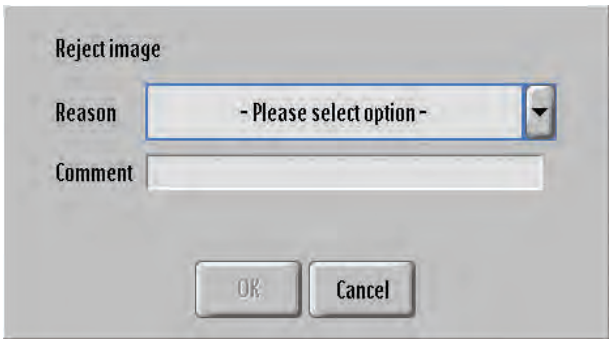
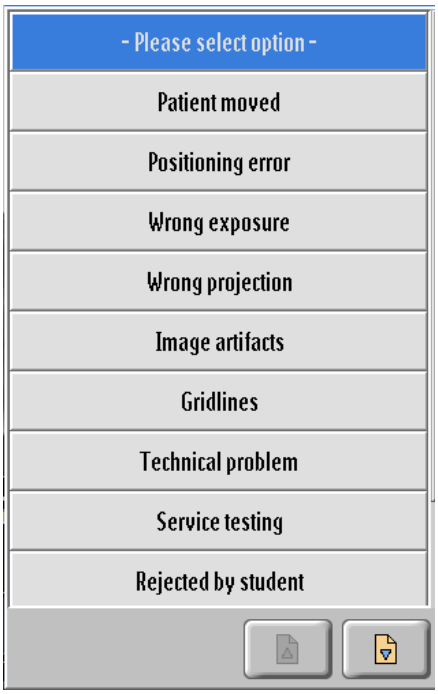


► Click on the arrow. A pull down menu appears (example):



► Select the desired setting.

► Type a comment if requested.

OK ► Confirm settings.

Or

Cancel ► Cancel.

Analyzing

The reasons for rejecting an image can be analyzed in the following statistics:

- Generate Image Statistics (this chapter):
  - Reject reason is selected from the Statistic topic list.
  - If you want to analyze the comment, put it on the topics list (see chapter “Customize List of Analyzed Values” on page 267).

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- Generate Statistics from Image Data Table, see “Generate Statistics from Image Data Table”.

Select the Statistic Topic

The topic for table and chart can be set as follows:

► Click the arrow.

► A pull down menu appears. Make the desired setting.

Set the Limit of Displayed Items

The data are sorted according to the frequency of occurance.

► Click the arrow.

► A pull down menu appears. Select the desired setting, for example, “5”.

⇨ The data with the highest rates are shown in the table, for example, the 5 highest rates.

Select the Chart Type

To change the chart type

► Click the arrow.

► A pull down menu appears. Make the desired setting.

You can choose between the following:

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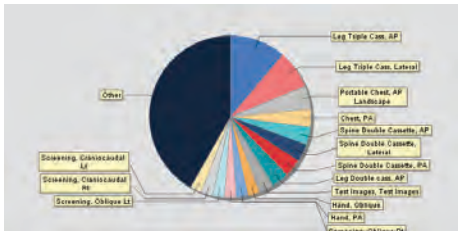
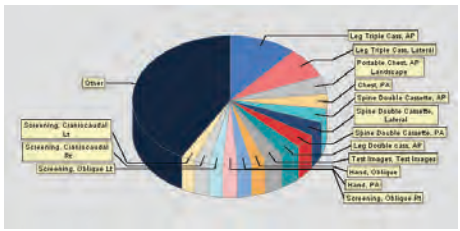
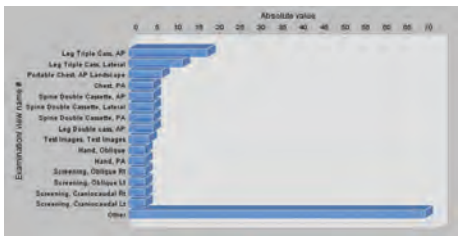
Chart type	Example
Pie chart 2D	
Pie chart 3D	
Bar chart 2D	
Bar chart 3D	

Customize Statistic Topic List

The list of statistic topics is predefined. You can customize the list:

Topics

- ► Click this.
- ► Make the desired changes.
  For a detailed description of how to make changes see chapter “Customize List of Analyzed Values” on page 267.

Export Image Statistics

The chart and the table can be exported for further use.

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Export ► Click this.The following appears:

► Select **Export table** or **Export chart**.

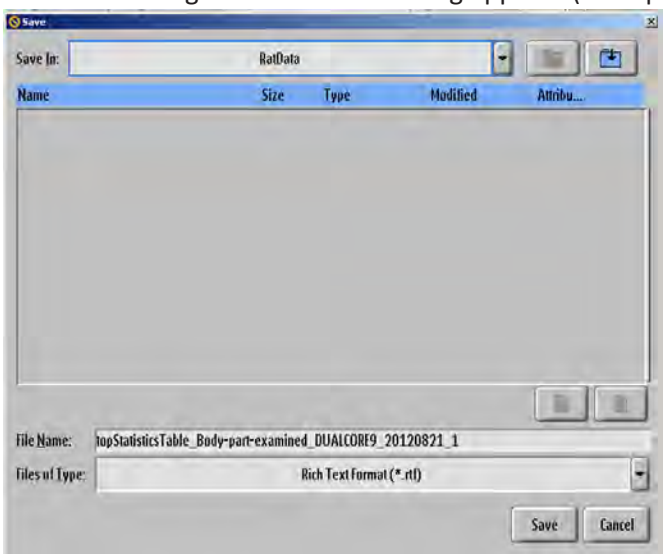
- Export table: The table is saved as rtf-file (rich text format) and can be opened with e.g. MS Word.
- Export chart: The chart is saved as jpg-file and can be opened with any viewer. You can place the saved chart into any other document.

OK ► Confirm selection

or

Cancel ► Cancel export.

⇨ After confirming with OK the following appears (example):



► Select drive “F:\transfer\RatData” (service partition).
The system suggests a file name that includes statistics type, topic, station ID, and date. You can change the file name and the file type.
If a USB stick is used you can also choose the USB drive.

Save ► Save the file

or

Cancel ► Cancel export.

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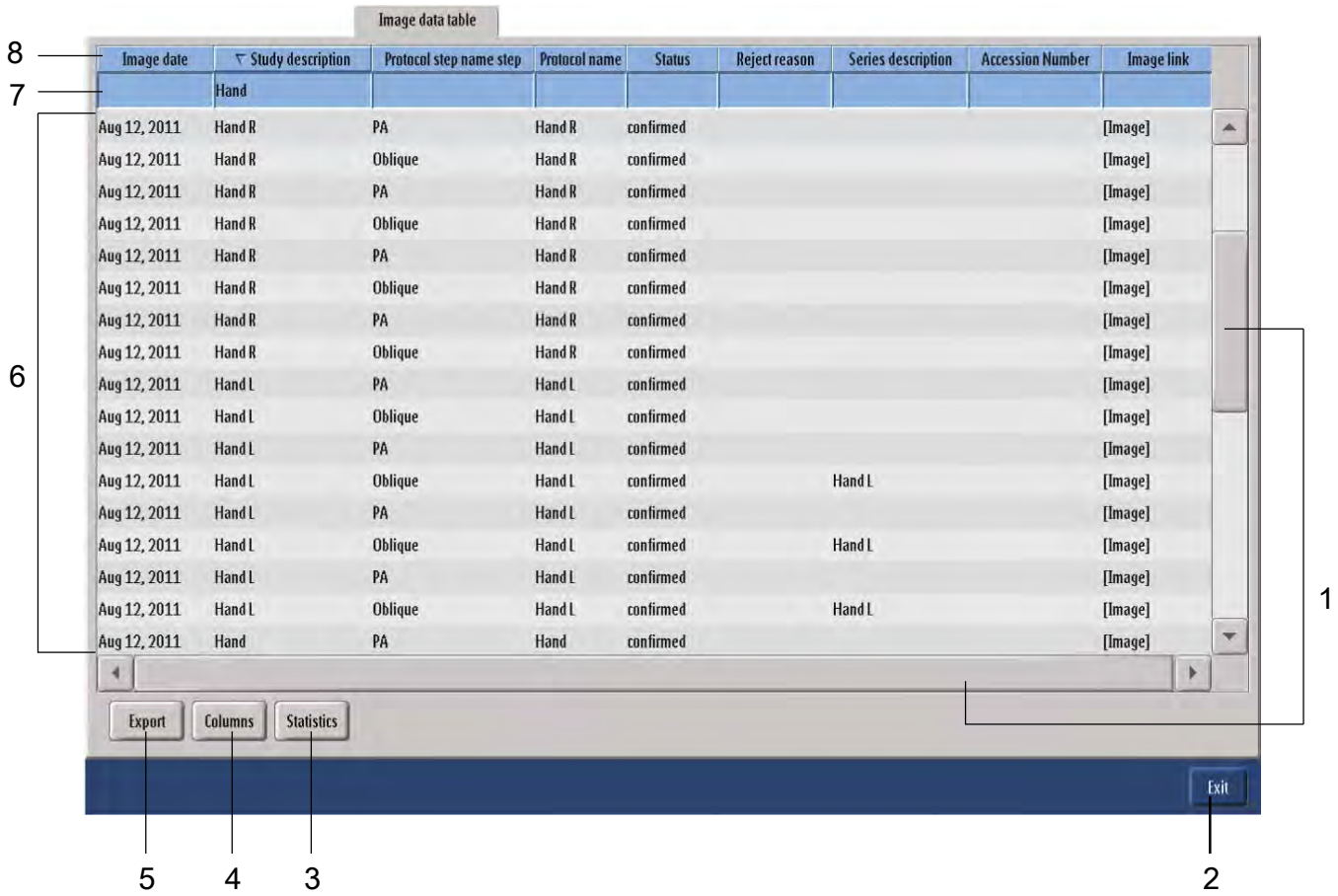
Generate Statistics from Image Data

Legend



No.	Description
1	Scroll bars
2	Exit QA Tool.
3	Detailed statistics of selected column
4	Customize table column.
5	Export statistics.
6	Show table of analyzed data.

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No.	Description
7	Column filter Here you can set a filter by typing at least the first two letters. In the example it is “Hand” in column “Study description”.
8	Column header Click a column header to sort this column in descending or in ascending order (shown by the little arrows).

You can set one or more column filters to reduce the amount of data.

The Image Data Table is an additional function needed when more detailed filtering, sorting etc. is required.

With this statistics you can check if there are any irregulatories regarding exposure index and the associated anatomic region.
E.g.:
10 chest images are shown with an exposure index between 300 to 500. 1 chest image is shown with an exposure index of 2.000.

Customize Table Column Configuration

The list of table columns is predefined. You can customize the list:

Columns

- ► Click this.
- ► Make the desired changes.
  For detailed description of how to make changes see chapter “Customize List of Analyzed Values” on page 267.

Show Image

You can view an image in reduced resolution. You cannot export images with this function.

- ► Click [Image] in the requested row.

  One of the following appears:

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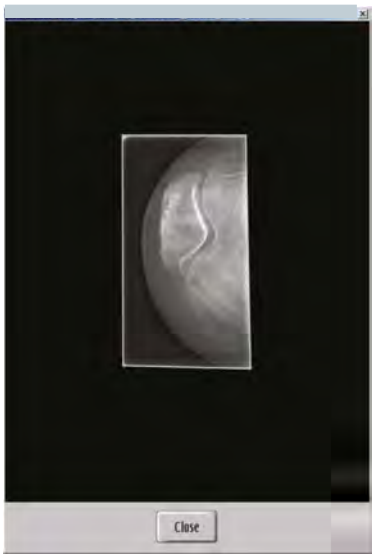
If the patient is still stored in the system, the image is displayed in low resolution:



Close ► Exit this view.

If the patient is already deleted by tidy up, the image cannot be displayed any more:

OK ► Exit this view.

Export Whole Data Sets from the Table

You can save the analyzed table for further use. The table can be saved in csv-format (comma seperated value) and can be read with any editor, e.g. with Microsoft Excel.

Export ► Click this. The following appears:

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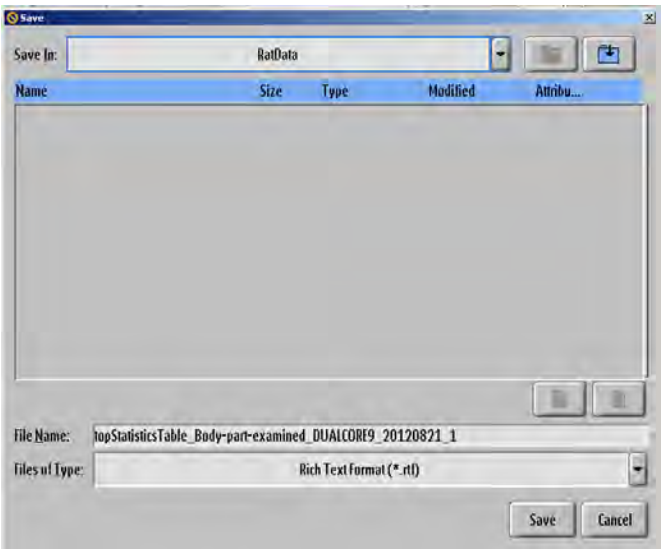

► Select drive “F:\transfer\RatData” (service partition).

The system suggest a file name, that includes statistics type, topic, station ID, and date. You can change the file name and the file type.
If a USB stick is used you can also choose the USB drive.

Save ► Save the file

or

Cancel ► Cancel export.

NOTICE

A seperator can be chosen. This depends on the country and may be necessary to avoid problems with the date format.

Detailed Column Statistics

You can call up details for each column of the image data table.

► Click the column for detailed analysis.

Statistics ► Click this. The following appears (example):

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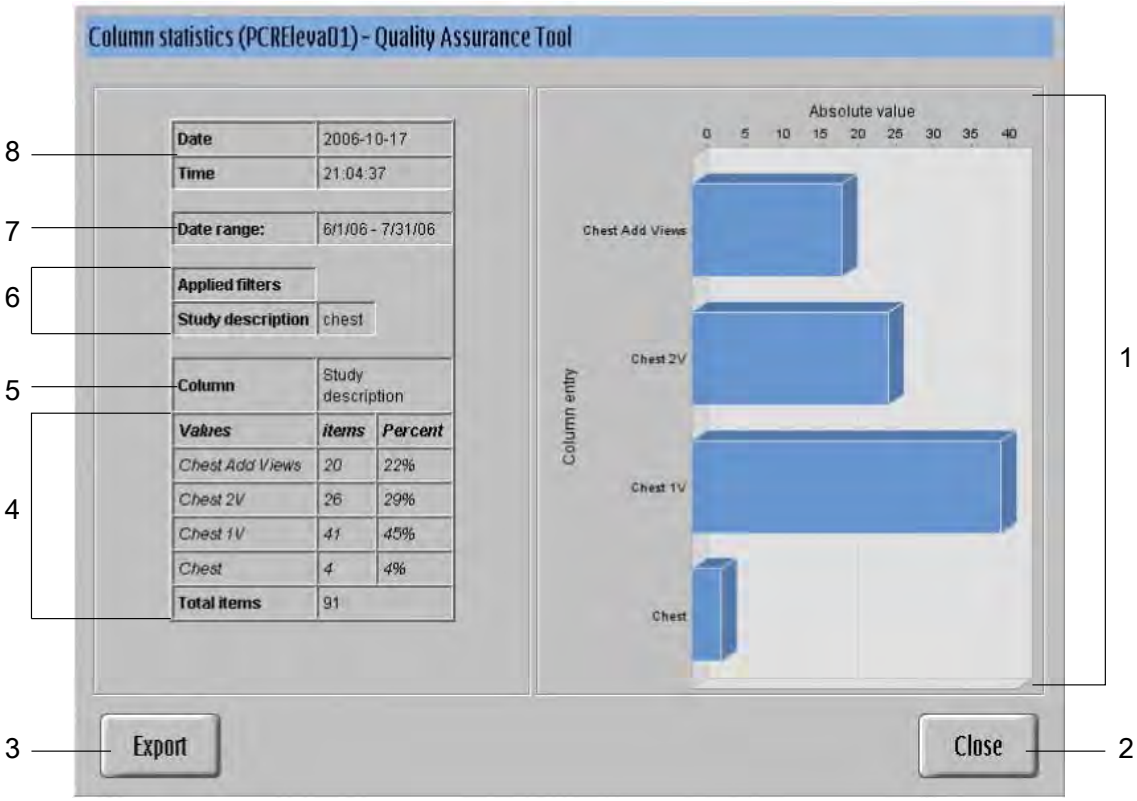

No.	Description
1	Show chart of analyzed data.
2	Exit column statistics.
3	Export statistics.
4	Show table of analyzed data of the selected column.
5	Show selected column of image data table.
6	Show applied filters.
7	Show selected time range.
8	Date and time of generation of column statistics.

NOTICE

If your result contains too many different analyzed data the associated graphic items may be merged on the monitor.

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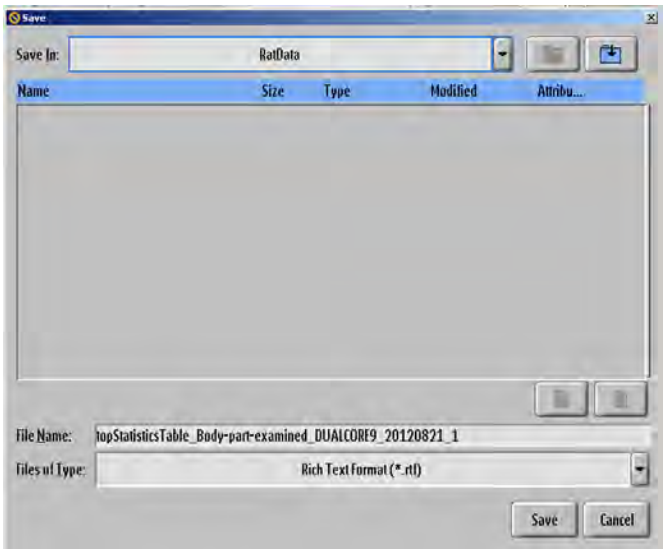
Export Column Statistics

Export

► Click this. The following appears:



► Select drive “F:\transfer\RatData” (service partition).

The system suggests a file name, that includes station ID and date. You can change the file name and file type (html, jpg, rtf, and txt).
If a USB stick is used you can also choose the USB drive.

Save

► Save the file.

Or

Cancel

► Cancel export.

Possible types of statistics are:

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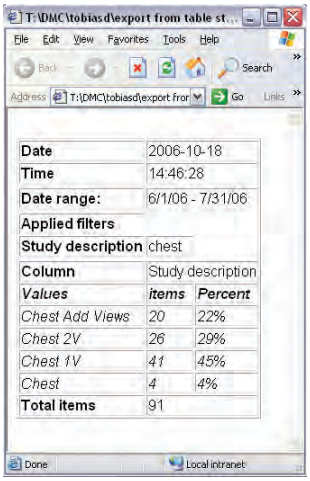
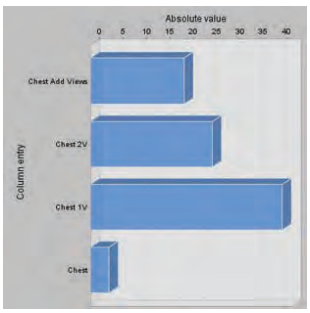
Type	Result (examples)
html	
jpg	

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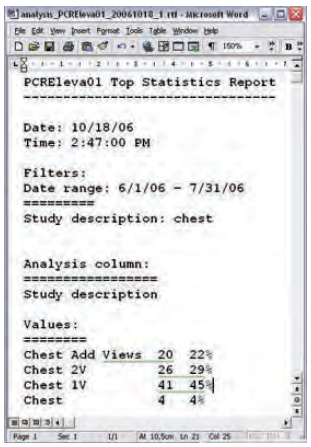
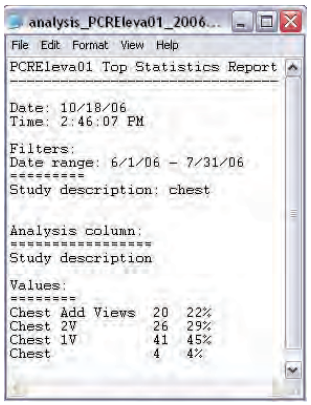
Type	Result (examples)
rtf	
txt	

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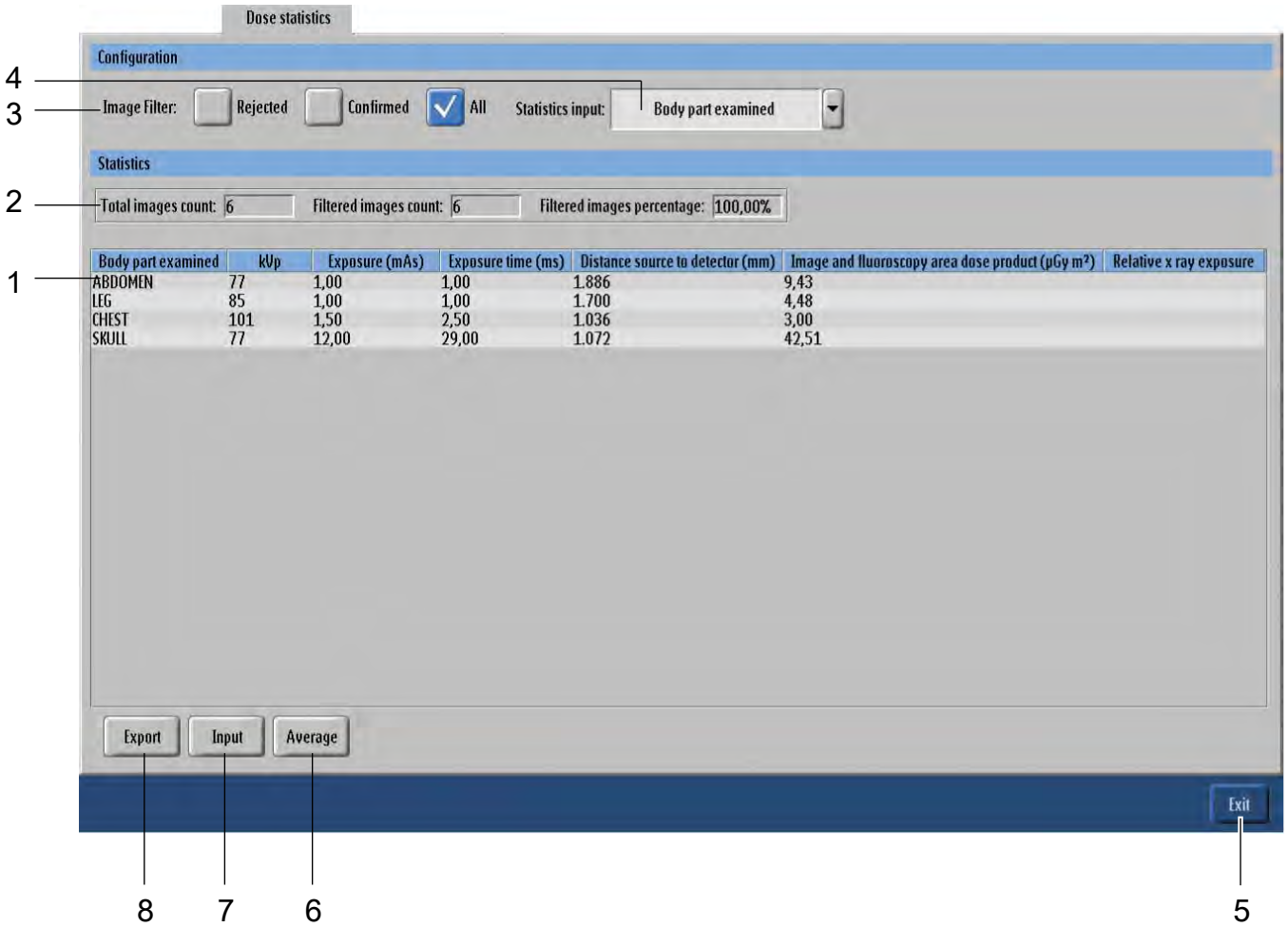
Generate Dose Statistics

Legend



No.	Description
1	Show table of analyzed data. • Left column: Input value selected from the statistics input list. • All further columns: Items defined in the average value column list. You can customize the table according your requirements.
2	Number of analyzed data: • The total number of analyzed images • The number of filtered images • The percentage of the filtered images

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No.	Description
3	Set image filter.
4	Set statistics input.
5	Exit QA tool.
6	Customize average value columns.
7	Customize statistics input.
8	Export dose statistics.

The dose statistics shows detailed exposure information (e.g. kVp, mAs, sensitivity).

Dose information only from digital detectors are stored and can be analyzed here (no cassette dose information).

Select Image Filter

Set one of the image filters (for details see chapter “Set Image Filter” on page 271) to modify the statistics:

- Click the arrow.

- A pull down menu appears. Select the desired setting.

Select Statistics Input

The input value can be set as follows:

- Click the arrow.

- A pull down menu appears. Select the desired setting.

Customize Statistics Input

The list of statistics input is predefined. You can customize the list:

Input

- Click this.
- Make the desired changes.
  For a detailed description of how to make changes see chapter “Customize List of Analyzed Values” on page 267.

Customize Average Value Columns

The list of average value columns is predefined. You can customize the list:

Average

- Click this.

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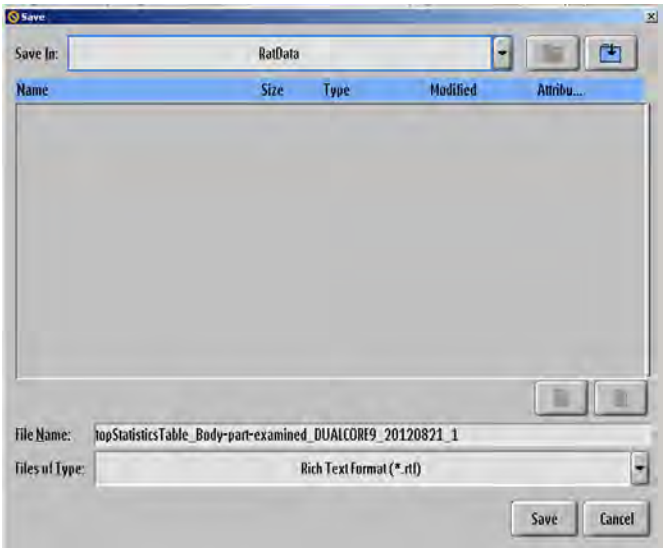
► Make the desired changes.
For a detailed description of how to make changes see chapter “Customize List of Analyzed Values” on page 267.

Export Dose Statistics

You can save the analyzed table for further use. The table can be saved as rtf-file (rich text format) and can be opened with e.g. Microsoft Word.

Export

► Click this. The following appears:



► Select drive “F:\” (service partition).

The system suggests a file name that includes input value, station ID and date. You can change the file name and the file type.
If a USB stick is used you can also choose the USB drive.

Save

► Save the file

or

Cancel

► Cancel export.

Frequently Asked Questions

How many image records can be stored in the QA tool?

The workspot stores information about the last 50.000 images.

The QA tool cannot analyze them all at once. Via setting of time range, you have access to all of them. The (low resolution) images can be displayed only until the original image (and the patient) has been deleted by the tidy up.

The duration of storage can be configured. The data will be stored in the system for at least 3 days.

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Can data from several workspots be displayed together?

No. Not with this tool.

The QA tool displays the data of the actual workspot only. Data can be merged together after export, e.g. with Microsoft Excel.

Are the QA data part of the backup and can they be restored after system re-installation?

No. Before you do backup and restoring it is recommended to export the existing QA data. This data can be handled in Microsoft Excel only.

NOTICE

After the backup and restoring of the system only new data can be analyzed.

Are the QA data stored forever?

No. The QA data are deleted if one of the following occurs:

- Move data from the Field Service Transfer tool to a medium.
- Update application software **and** software of operating system.
- If more than about 50.000 image data exist, the oldest image data are automatically removed.

Exporting the Original Image Data

Purpose

For image quality testing, you can access the original image data acquired on the detectors.

Original image data are image data that have been pre-processed to account for detector limitations as allowed in IEC 62220-1-1. The pre-processing includes the correction of bad or defective pixels and a flat-field correction.

The image data are linearized data. The data are directly proportional to the air kerma when you acquire them under the same conditions used for detector calibration. You can adapt the mAs to your needs.

You can access the original image data for all fixed and portable detectors used at the system.

This applies only for radiography images.

How to Export the Original Image Data

▷ An export node of the type “Export DX for processing” has been configured in the service tool for quality control purposes.

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▷ You have prepared the Eleva Workspot and the geometry exactly as you would for a gain calibration of the detector (see section “Detector Calibration”).

▷ The detector temperature is stabilized as described in section “Detector Calibration”.

► Go to **Patient list**.

► Select **Original Image Data Export**.

► Go to **Examination**.

► Select the view **Internal filter: 0.5 mm Cu + 2 mm Al**.

► Adapt the mAs to your needs.

► Release the exposure.

► Go to **Review**.

► Select the test image.

NOTICE

For further evaluation, the image is displayed without any processing applied. Therefore, it appears flat and grey. Do not change the processing settings.

► Select **Store ...**.

► Select **Export DX for processing**.
The dedicated export node of the type “Export DX for processing” may have a different name at your system.

► Select **Store** to start the export.

NOTICE

Alternatively, you can store the image on CD or DVD or save it to the service partition.

Under the defined exposure conditions, the following image properties apply:

- Pixel value range: –100 to 31.050
- Bits allocated: 16
- Bits stored: 16
- Pixel representation: 1
- Pixel intensity relationship: LIN
- Sensitivity: 207 LSB/µGy

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14 Maintenance, Cleaning and Disposal

Maintenance

Planned Maintenance

This product requires proper operation, planned maintenance, and checks the user must perform routinely, which are essential to keep the product operating safely, effectively and reliably.

Planned Maintenance Program

Planned maintenance may be carried out only by qualified and authorized personnel, and is comprehensively described in the service documentation.
Philips provides a full planned maintenance and repair service on both a call basis and a contract basis. Full details are available from your customer service.

When you carry out planned maintenance, you should always take all practical steps to make sure that the Planned Maintenance Program is fully up to date **before** using the product with a patient.

Repairs

X-ray units contain mechanical components which are subjected to wear and tear due to operation.

The correct setting of the electromechanical and electronic assemblies affects the functioning, image quality, mechanical and electrical safety and exposure of the patient and medical personnel to radiation.

Philips recommends the following:

- The tests indicated in the table are performed on a regular basis (see “Tests and Checks by the User”).
- The X-ray unit is serviced by the Philips customer service at least one a year. Heavily used X-ray equipment must be serviced more frequently.

In this way, you avoid endangering the patient and you meet your obligations.

WARNING

Faulty components must be replaced by genuine spare parts.

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Recording Results

Service and repairs must be entered in the medical products logbook, including the following data:

- Type and extent of work
- Details of any changes to ratings or the working zone, if necessary
- Date, person performing the work, signature

User Routine Checks

Obligations of the User

As with any technical appliance this X-ray equipment also requires the following:

- Proper operation
- Regular testing by the user
- Regular service and repair

By taking these preventive actions you maintain the operability and operational reliability of the system. As the user of an X-ray equipment you are obliged to take such precautions – according to accident prevention regulations, the medical products law and other regulations.

WARNING

Maintenance consists of tests which the user can perform and maintenance which is performed under service agreements, customer service orders or by persons explicitly authorised to do so by Philips.

Tests by the User

The user must check this device for apparent defects (see table). If operational defects or other deviations from normal operational behavior occur, he must switch off the device and inform customer service. He may only resume operation of the device after it has been repaired. Operation using faulty components may lead to an increased safety risk.

Interval	Scope	Method
Daily	Faulty display lamps, damaged components, labels, warning signs, oil leaks	Visual monitoring
Weekly	Check of all cables and terminals. In case of damage or breakage, do not use the system and inform customer service.	Visual monitoring

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Interval	Scope	Method
Weekly	Check and if necessary correct the system date and time at the Eleva Workspot, if automatic date and time setting is not available in the environment. Go to **System/Administration/System administration**.	Visual monitoring
Every 3 months	Image display performance check for all monitors in control room and examination room	See “Image Display Performance Check”

NOTICE

Quality control (image quality and radiation dose) should be performed at regular intervals according to local regulations.

Safety Checks

The safety checks relate to function and operational reliability. **They must be performed at least every 2 years.** These checks constitute part of preventive maintenance under service agreements from Philips. They cover the following:

- Visual checking for completeness and apparent damage or defects as well as soiling, sticking parts and wear and tear which may affect safety.
- Testing the monitoring, safety, display and indicating systems.
- Measuring the safety-relevant output parameters.
- Checking electrical safety (as per EN 62353) and the internal energy supply.
- For the particular product, other special technical tests according to the generally accepted standards of engineering practice.
- Other tests specified by the manufacturer.
- Recording results and filing the test reports in the system manual (medical products logbook).

Medical-technical systems contain mechanical components which are subjected to wear and tear due to operation.

The correct setting of the electromechanical and electronic assemblies affects the functioning, image quality, electrical safety and exposure of the patient and medical personnel to radiation.

Philips recommends the following:

- That the user perform the tests indicated in the table on a regular basis.
- That you have the device serviced by the Philips Service Organization at least once a year. Heavily used X-ray equipment must be serviced more frequently.

In this way you avoid endangering the patient and you meet your obligations.

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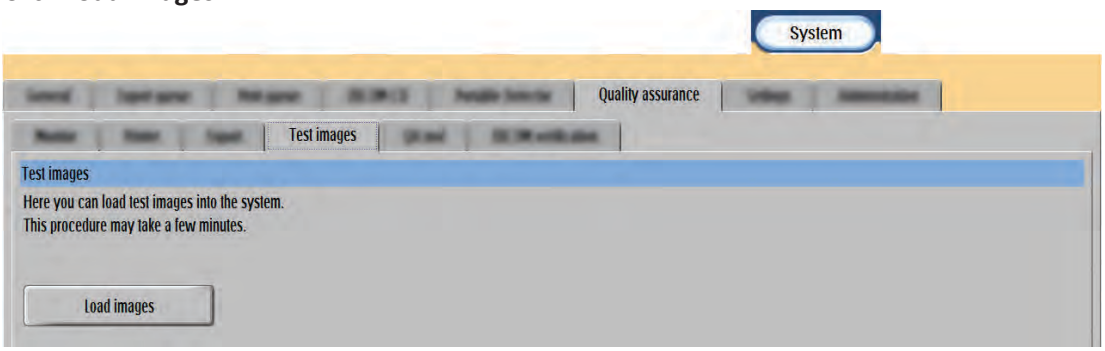
A service agreement with Philips will retain the value and safety of your equipment. All the necessary maintenance, including the safety tests for preventing hazards, and the necessary adjustments for optimum image quality and minimum exposure to radiation, are performed at regular intervals. By mutual agreement between you and Philips, service intervals can be scheduled according to your individual needs, taking into account local legislation.

Image Display Performance Check

The Eleva Workspot employs a TG18-OIQ (Overall Image Quality) test image for checking the image reproduction chain performance. LCD monitor technology and the DICOM grayscale ensure that the image reproduction characteristics stay mostly constant and that regular recalibration is not needed.

Because of the large impact on diagnostic accuracy, however, it is recommended to regularly check image reproduction. Philips recommends regular checks every three months and whenever a change in image display performance is suspected.

- In the **System** section go to **Quality assurance** and **Test images**.
- Click **Load images**.



This procedure may take a few minutes. Please wait till the message disappears.

- Select **Patient list**.
  In the patient list, the examination **Test, Images** appears.
- Select the examination **Test, Images**.
- Go to the **Review** section.

⇨ All test images are displayed.

NOTICE

Together with the test images, the last five unprocessed patient images are displayed. If necessary, these can be moved to a patient folder using the move tool.

- Select **Test Images AAPM TG18-OIQ**.

- Select the fullscreen function.

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- ► Select the pixel-to-pixel representation.
- ► Perform the tests under typical viewing conditions. The ambient light level has a large influence on the test results.

NOTICE

If the fullscreen function is not available at your system, move the image with the finger or mouse to perform all visual inspections.

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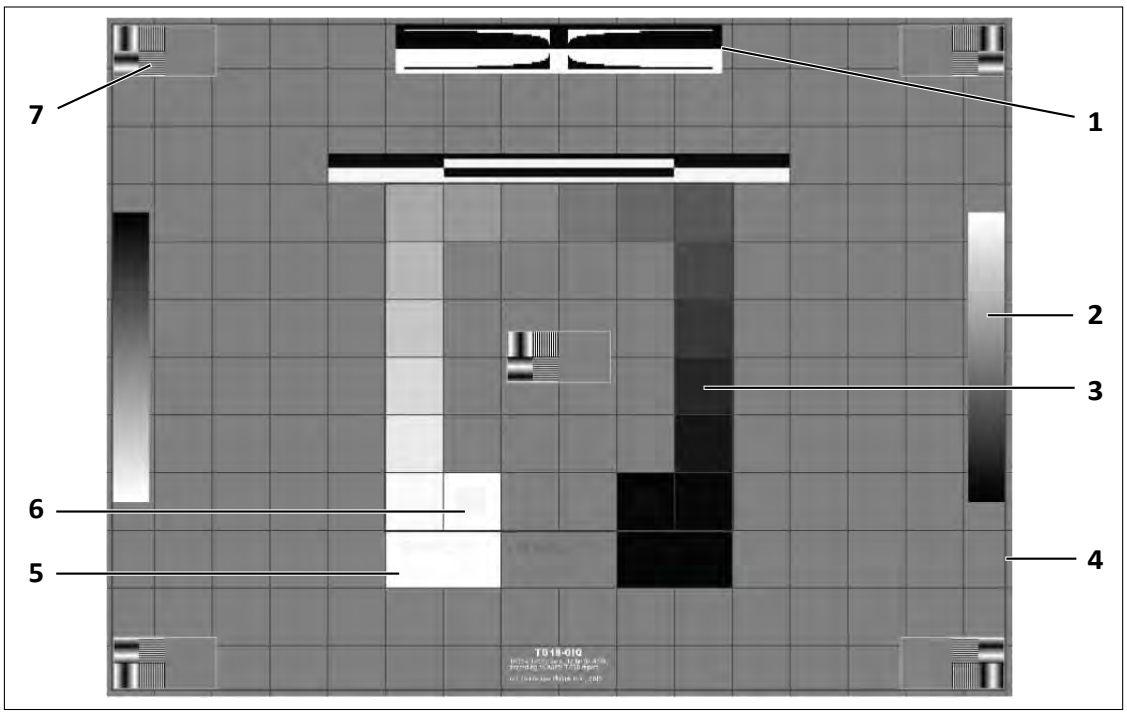

Fig. 24: TG18-OIQ test image

1	Direct black-to-white and white-to-black transitions should be visible.
2	The ramp bars should appear continuously.
3	All 16 luminance patches should appear.
4	Borders and lines of the pattern should be visible and appear straight.
5	The text “QUALITY CONTROL” should be visible in the black, gray, and white text area. The last three letters “ROL” of the word “CONTROL” may be missing in the black area.
6	The 5% square should be clearly visible against the 0% background. The 95% square should be clearly visible against the 100% background. Note: Results may differ depending on the ambient light intensity.
7	The line-pair targets should be visible and should not be distorted or have any streaks, blur or drop-outs. The two-pixel wide, low-contrast line-pair targets should be visible and should not be distorted or have any blur or drop-outs either in the centre or in the four corners.

Tab. 1: Display Performance Check

- ► Should any of these tests fail, reset the image processing to default. Check the viewing conditions:
  - Is the ambient light level sufficiently low?
  - Is the display surface clean?
  - Are there no disturbing reflections on the screen?

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- Is the viewing angle appropriate?

► Repeat the test.

If the problem persists, contact customer service for immediate repair.

Image Quality Evaluation

To assess the imaging properties of the system, use a technical phantom that supports an evaluation of parameters such as:

- Spatial resolution
- Low contrast resolution
- High contrast resolution
- Dynamic range
- Uniformity
- Alignment and geometry

Prefer a common DR phantom that is approved by expert committees like the American Association of Physicists in Medicine (AAPM), the U.K. Hospital Physicists' Association (I.P.E.M.) or by standards like DIN 6868-150. Follow the phantom-specific instructions and evaluate the imaging properties under consistent conditions. Local regulations may provide further information.

NOTICE

When you acquire pulsed fluoroscopy images for quality assurance purposes (images of technical phantoms or homogenous images without an object in the beam), the brightness level of successive images may change. In this case, we recommend to use an image processing setting that takes the presence of direct radiation appropriately into account. For further support, please contact the local customer service.

Detector Calibration of Dynamic Detector

The dynamic detector (table detector) must be calibrated every 12 month by customer service. Please inform customer service, when calibration is due.

When the calibration is due a message informs you. When image artifacts are suspected, a message informs you about a calibration to be done.

To check when the next calibration is due:

► Click on the status display in the lower right corner of the screen.

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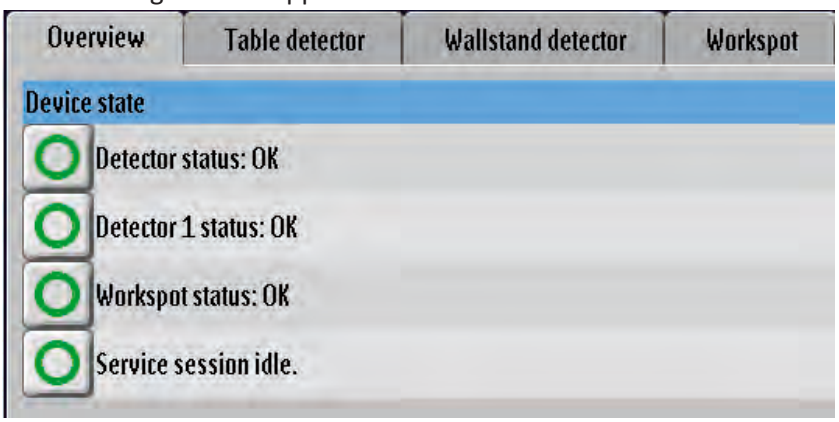
⇨ The following window appears:



► Click Detector status or **Detector 1 status**.

⇨ The date for the next calibration appears.

► Click **Close** to close the window.

Detector Calibration of Fixed Detector in Bucky Tray

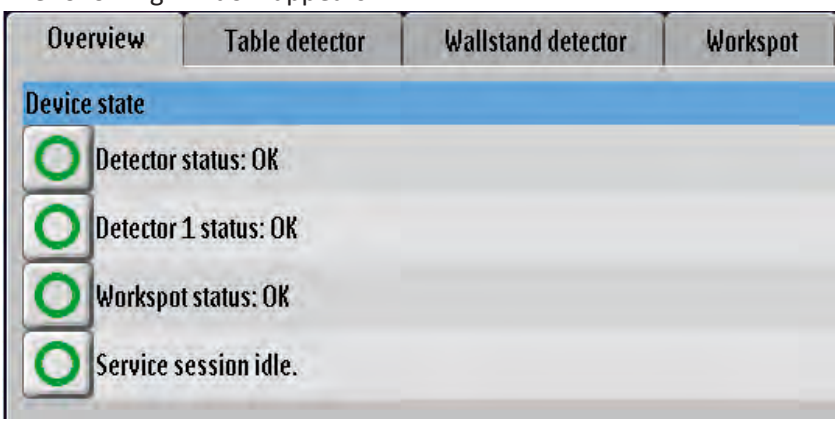
Preparation

The detectors must be calibrated every 6 months. The calibration takes about 20 minutes for each detector.

To check when the next calibration is due:

► Click the status display in the lower right corner of the screen.

⇨ The following window appears:



► Click **Detector status** or **Detector 1 status**.

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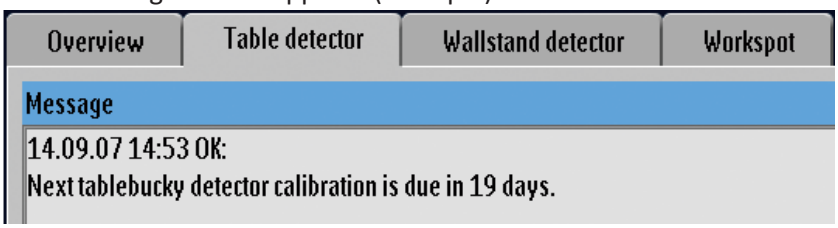
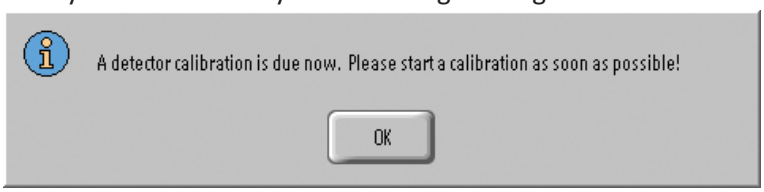
⇨ The following window appears (example):



► Click **Close** to close the window.

The system indicates by the following message if the next calibration is due:

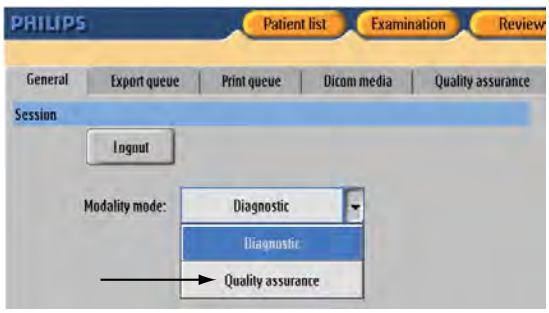


NOTICE

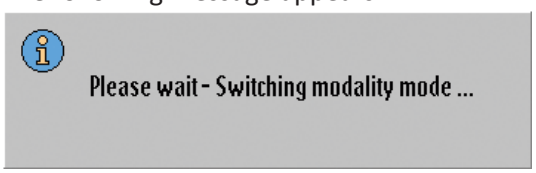
- Some calibration steps require release of X-rays.
- Detector must be warmed up (powered at least 4 hours).
- Make sure no high dose X-rays are taken prior to calibration. In that case wait 20 minutes before starting the calibration.
- During calibration the temperature and the detector temperature shall be the same as during operation.

► Go to **General** in the **System** section.

► Choose the modality mode **Quality assurance**.



⇨ The following message appears:



⇨ The system switches to the quality assurance mode.

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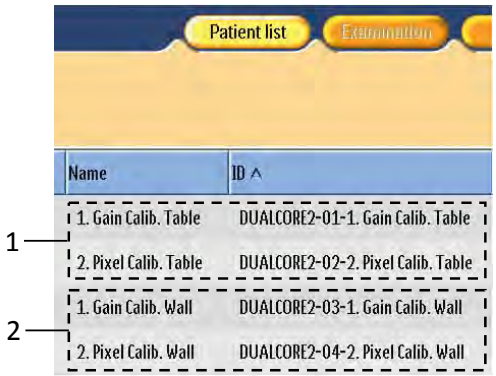
► Go to the **Patient list** section.

Several entries appear, two of them for calibration of the table detector (1) and two of them for calibration of the wall detector (2).



► Perform the calibration examinations for each detector in this order:

1. Gain calibration (with radiation)

2. Pixel calibration (with radiation)

► Follow the instructions on the screen until all calibration steps are performed.

Gain Calibration

At the Eleva Workspot

► Select **Gain calibration** in the patient list.

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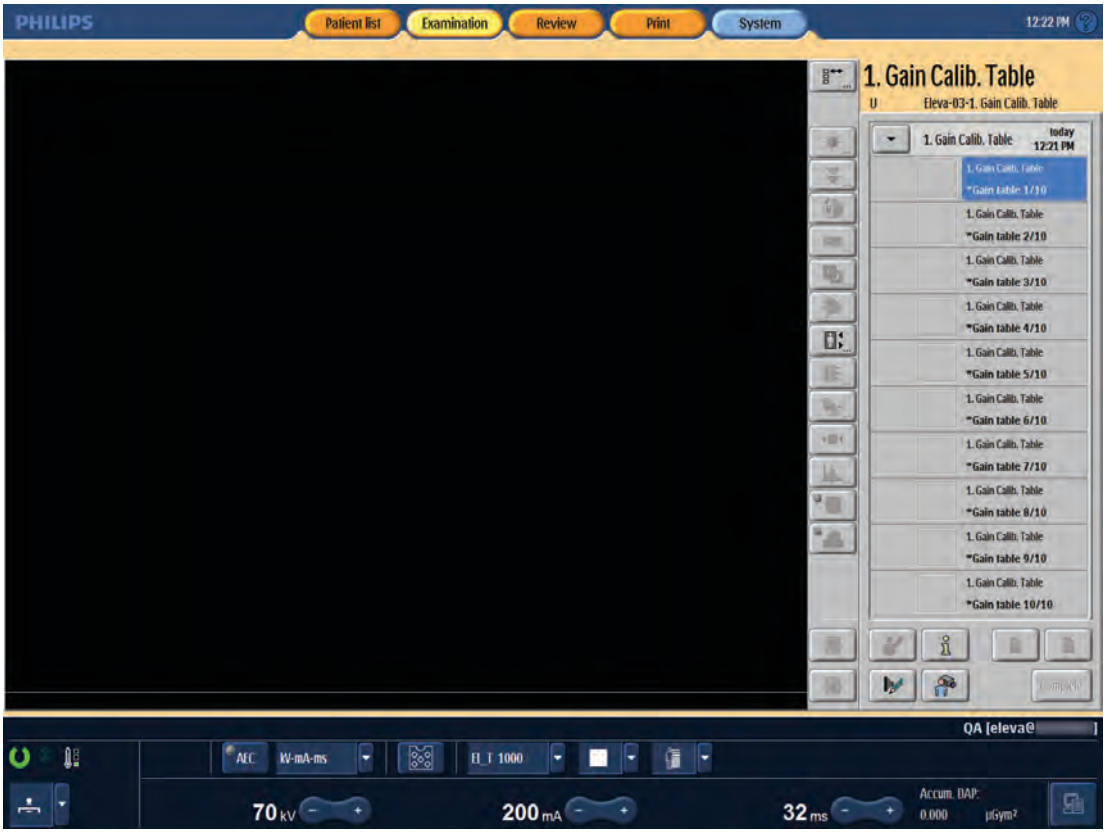
► Go to the **Examination** section.



Example: Table detector

⇨ The first view is selected.

At the Geometry

► Table detector only: Adjust the table top. Make sure that the not radiolucent parts of the table top are not in the path of radiation.

► Wall detector only: Clean the detector housing if necessary.

► Align the X-ray tube with the detector.

► Remove all objects from the path of radiation.

► Table detector: Set the SID to 110 cm (43.3 in).
Wall detector: Set the SID to 150 cm (59.1 in).

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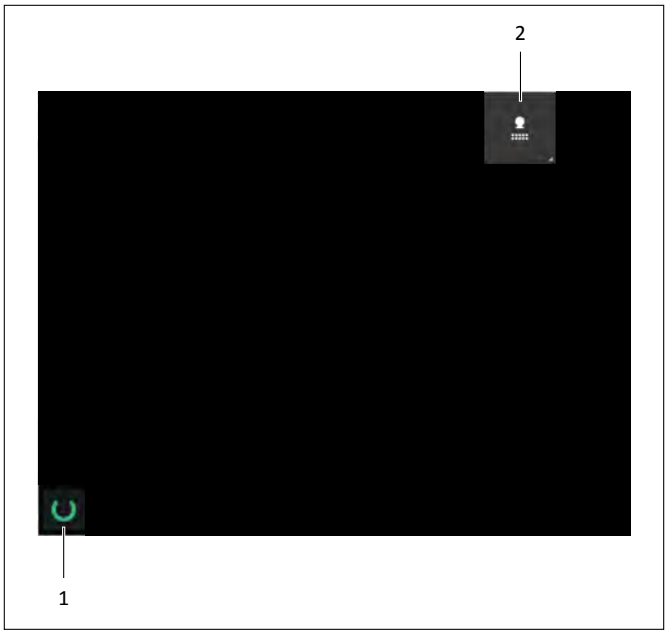
- Make sure that the system is ready for exposure (1).

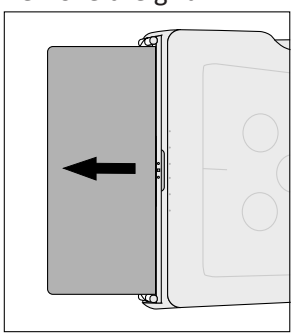


- Make sure the correct auxiliary is selected (2).

NOTICE

You must always use the same SID for calibration.

- Make sure that the field size is set to 47 cm × 47 cm (18.5 in × 18.5 in).
- Set the internal filter to 0.5 mm Cu + 2 mm Al.
- Remove the grid.



At the Eleva Workspot

- Perform all acquisitions as in the clinical mode. Start with the first view and end with the last view.

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⇨ At every acquisition, the system checks for the field size, the detector signal and any objects in the path of radiation. If an error is detected, check the acquisition conditions and repeat the examination.

NOTICE

Deviation Index

The indicator for the deviation index may show a red signal after each exposure. During the detector calibration you can ignore the indicator.

⇨ If the gain calibration was successful, the system updates the gain calibration data and the gain calibration date for the detector. It displays the following message: “Gain calibration successfully finished.”

► To confirm, press **OK**.

⇨ If the gain calibration was not successful, a corresponding message appears. The system does not change the old gain calibration data.

⇨ If the gain calibration fails again, call customer service.

Pixel Calibration

NOTICE

Perform the pixel calibration directly after a successful gain calibration.

► Select **Pixel calibration** in the patient list.

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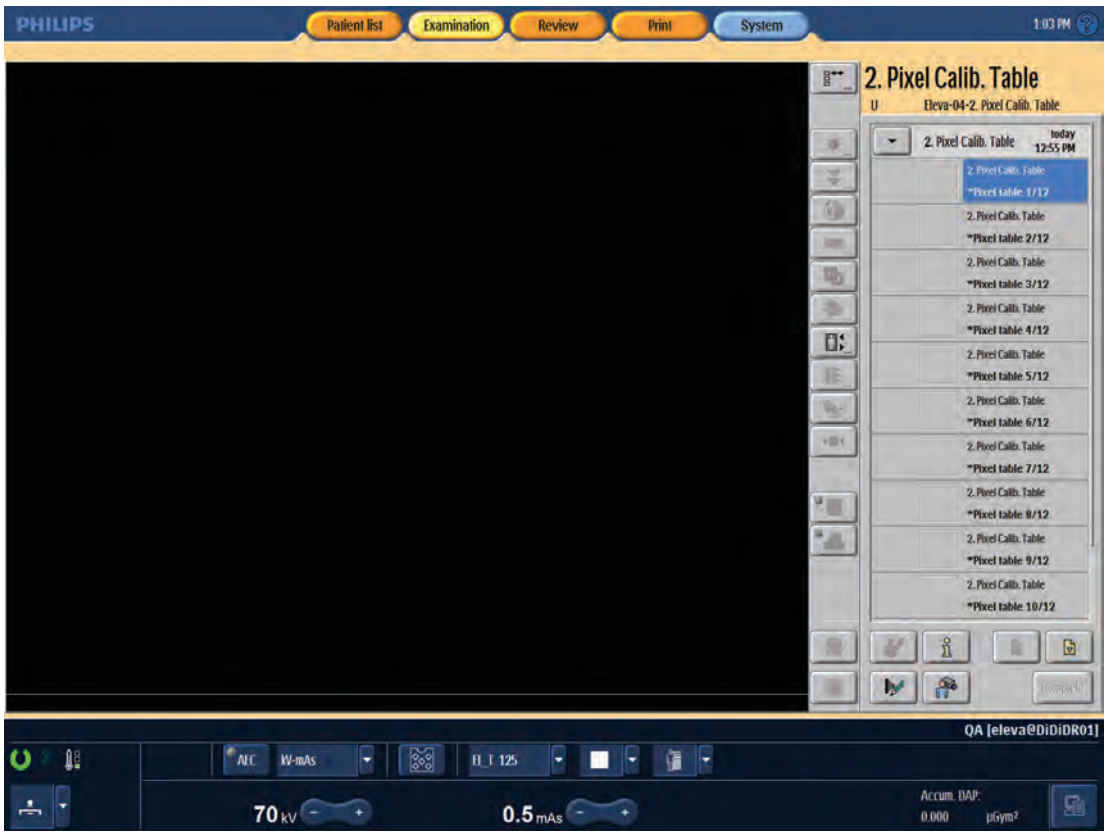
► Go to the **Examination** section.



Example: Table detector

► Perform all acquisitions as in the clinical mode. Start with the first view and end with the last view.

At every acquisition the system checks the detector signal, the field size and for objects in the path of radiation. If an error is detected, check the acquisition conditions and repeat the examination.

NOTICE

Deviation Index

The indicator for the deviation index may show a red signal after each exposure. During the detector calibration you can ignore the indicator.

⇨ If the pixel calibration was successful, the system updates the calibration data and the date of calibration. It displays the following message: “Pixel calibration successfully finished.”

► To confirm, press **OK**.

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⇨ If the pixel calibration was not successful, a corresponding message appears. The system does not change the old calibration data.

⇨ If the calibration fails again, call customer service.

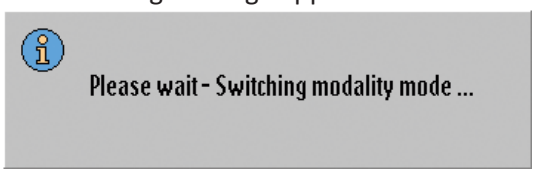
NOTICE

The generator is not able to make more than 6 exposures per minute. If you try to make more than 6 exposures per minute, there will be no acquisition, although the ready light appears. The system will not show a message. Wait till an acquisition is possible.

► Go back to **System** and **General**.

► Change the modality mode back to **Diagnostic**.

⇨ The following message appears:



⇨ The system switches to the diagnostic mode.

At the Geometry

► Insert the grid if necessary.

Detector Calibration of SkyPlate Detector

Preparation

NOTICE

Always use the table X-ray tube assembly, even though there is a CS X-ray tube assembly available.

The detector must be calibrated every 6 month. The calibration takes about 5 minutes.
To check when the next calibration is due:

► Click the status display in the lower right-hand corner of the screen.

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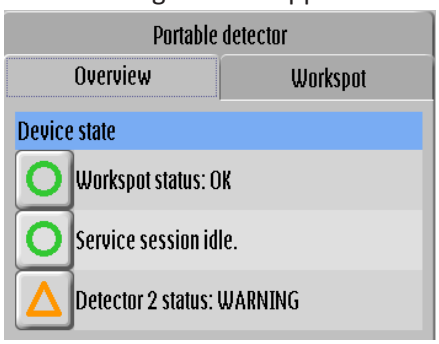
⇨ The following window appears:



► Click **Portable Detector**.

⇨ The date for the next calibration appears.

► Click **Close** to close the window.

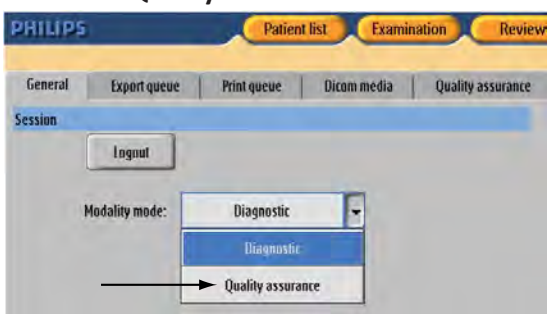
NOTICE

- Some calibration steps require a release of X-rays.
- The detector must be warmed up (power on for at least 30 minutes).
- The Eleva Workspot must be running for at least 15 minutes.
- Make sure that no high dose X-rays had been taken prior to calibration. If so, wait 20 minutes before starting the calibration.
- Make sure that during calibration the temperature and the detector temperature are the same as during operation.
- Perform a detector calibration only when the temperature of the detector is between 24°C (75°F) and 36°C (97°F).
  Make sure that the temperature of the room is around the same range, and that you have followed the instructions above.
- When the detector is not at a suitable temperature, a message informs you of this.

At the Eleva Workspot

► Go to **System** and **General**.

► Select the **Quality assurance** mode.



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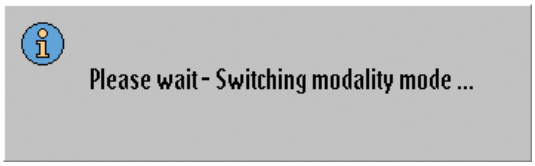
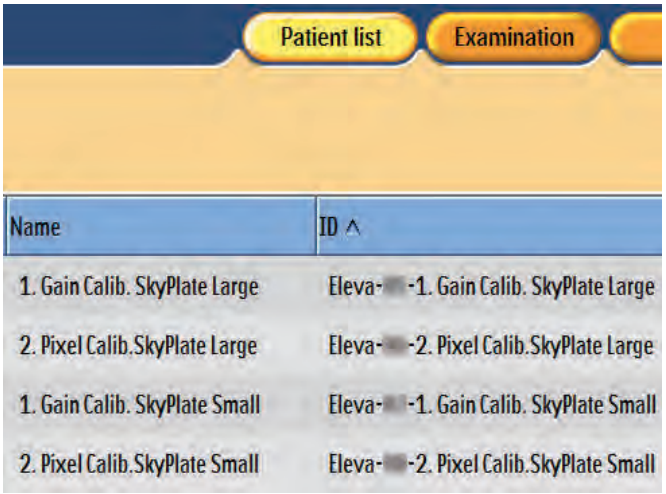
⇨ The following message appears:



⇨ The system switches to the quality assurance mode.

► Go to **Patient list**.

⇨ Several entries appear. There are two calibration examinations for each portable detector size available. Choose the appropriate detector size.



► Perform the calibration examinations for each portable detector in this order:
1. Gain calibration
2. Pixel calibration

► After performing the preparation steps at the unit, follow the instructions on the screen until all calibration steps have been performed.

At the Unit

► Remove the grid frame.

► Clean the detector if necessary.

► Position a lead apron on the table or on the floor.

► Position the detector on the lead apron. Consider the following:

- The marking on the detector is located on the bottom left-hand side when standing in front of the X-ray tube assembly.

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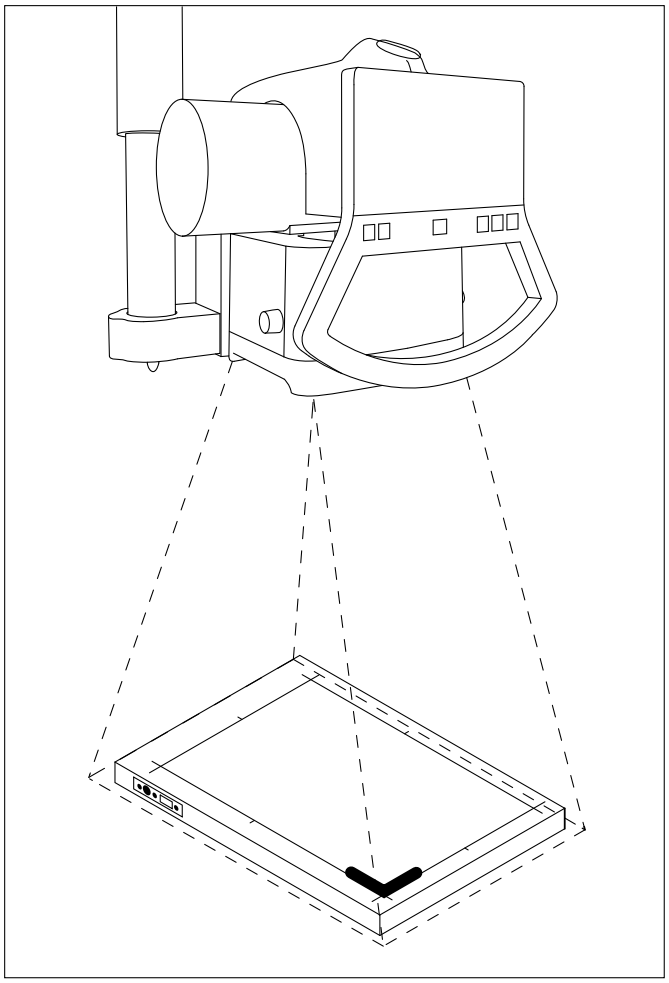
- The detector is not tilted.



► Remove all objects from the path of radiation.

► Set the SID to 150 cm (59 in).

NOTICE

Always use the same SID when calibrating.

► Align the collimator to the center of the detector.

► Change the field size so that it exceeds the sensitive area of the detector by at least 2 cm (0.8 in) (X), for example:

- Large detector at least 39 cm x 47 cm (15.4 in x 18.5 in)

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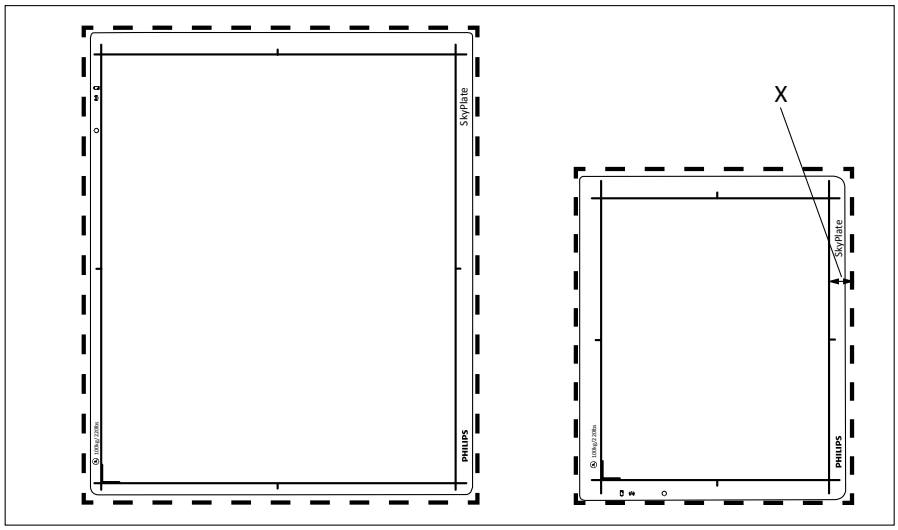
- Small detector at least 28 cm x 34 cm (11 in x 13.4 in)



► Make sure the correct registration device has been selected.

► Make sure that the system is ready for exposure.

► The filter will be selected automatically.

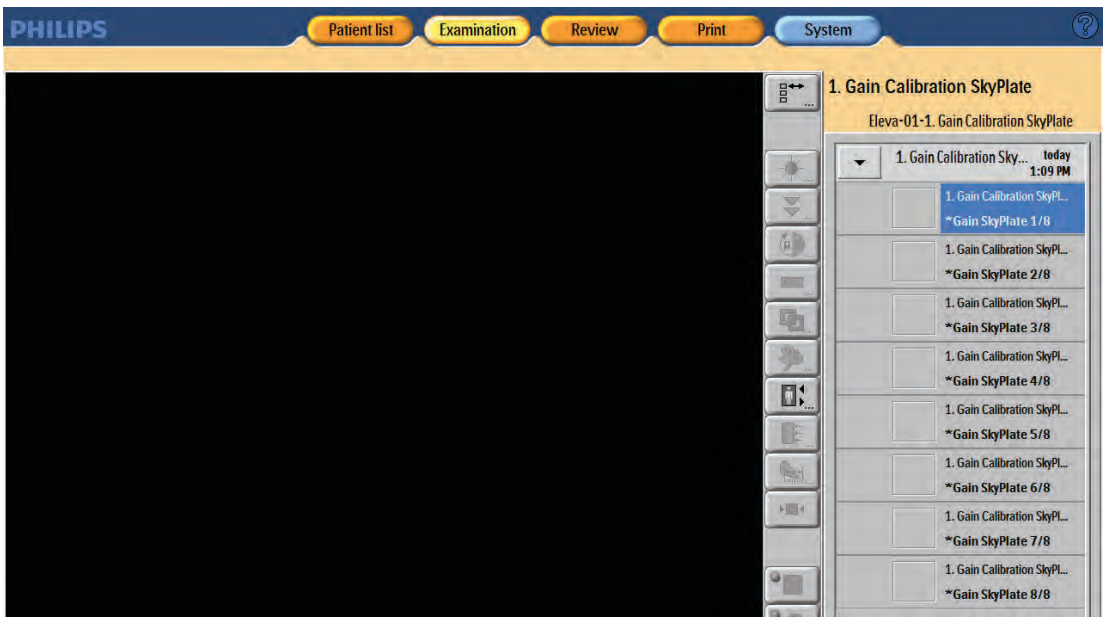
Gain Calibration

At the Eleva Workspot

► Go to **Patient list** and **Gain calibration**.

► Go to the **Examination** section.

⇨ The first view is selected.



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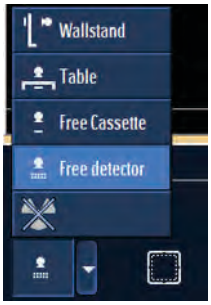
► Ensure that the **Free detector** registration device is selected.



► Release the first exposure.

⇨ The image is transferred to the Eleva Workspot.

⇨ The next view is automatically selected.

► Perform all acquisitions as in the clinical mode. Start with the first view and end with the last view.

⇨ At every acquisition, the system checks for the field size, the detector signal and any objects in the path of radiation.
If an error is detected, check that all preparation steps have been performed correctly and repeat the examination from the beginning.

NOTICE

Deviation Index

The indicator for the deviation index may show a red signal after each exposure. During the detector calibration you can ignore the indicator.

⇨ If the gain calibration was successful, a corresponding message appears. The system updates the gain calibration data and the gain calibration date for the detector.

► To confirm, press **OK**.

⇨ If the gain calibration was not successful, a corresponding message appears. The system does not change the old gain calibration data.

► Repeat the gain calibration.

⇨ If the gain calibration fails again, call customer service.

NOTICE

The generator is not able to make more than 6 exposures per minute. If you try to make more than 6 exposures per minute, there will be no acquisition, although the ready light appears. The system will not show a message. Wait till an acquisition is possible.

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NOTICE

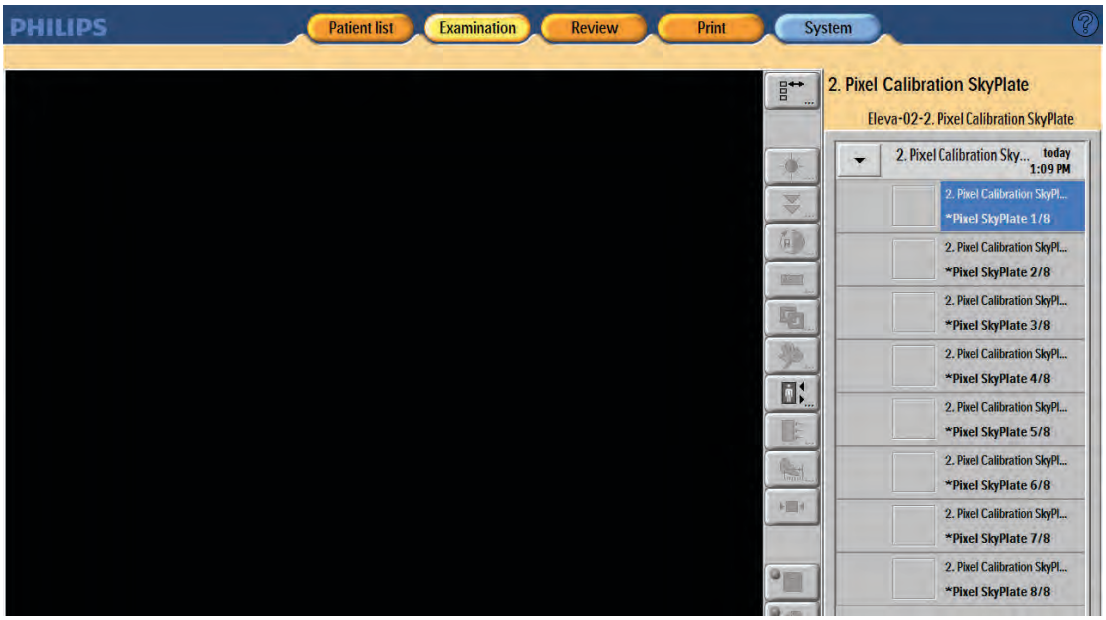
In case of problems during the calibration you can restart the calibration procedure by switching back and forth between the **Diagnostic** and the **Quality assurance** mode.

Pixel Calibration

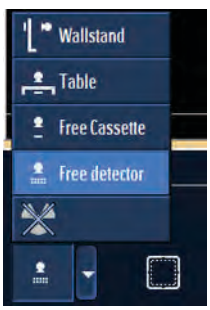
NOTICE

Perform the pixel calibration directly after a successful gain calibration.

- ► Go to **Patient list** and **Pixel calibration**.
- ► Go to the **Examination** section.
- ⇨ The first view is selected.



- ► Ensure that the **Free detector** registration device is selected.



- ► Release the first exposure.

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⇨ The image is transferred to the Eleva Workspot. Then the next view is automatically selected.

► Perform all acquisitions as in the clinical mode. Start with the first view and end with the last view.

At every acquisition the system checks the detector signal, the field size and for objects in the path of radiation.
If an error is detected, check that all preparation steps have been performed correctly and repeat the examination from the beginning.

NOTICE

Deviation Index

The indicator for the deviation index may show a red signal after each exposure. During the detector calibration you can ignore the indicator.

⇨ If the pixel calibration was successful, a corresponding message appears. The system updates the calibration data and the date of calibration.

► To confirm, press **OK**.

⇨ If the pixel calibration was not successful, a corresponding message appears. The system does not change the old calibration data.

► Repeat the pixel calibration.

⇨ If the pixel calibration fails again, call customer service.

NOTICE

The generator is not able to make more than 6 exposures per minute. If you try to make more than 6 exposures per minute, there will be no acquisition, although the ready light appears. The system will not show a message. Wait till an acquisition is possible.

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NOTICE

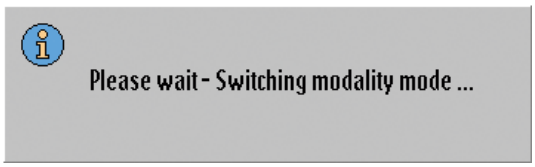
If you need to calibrate a second detector directly after the first one, always proceed in this order:

- Calibrate the first detector.
- Change the modality mode back to **Diagnostic**.
- Change the modality mode back to **Quality assurance**.
- Connect the detector that you want to calibrate next. The system is now ready for the calibration of the second detector.
- Calibrate the second detector.

► Go back to **System** and **General**.

► Change the modality mode back to **Diagnostic**.

⇨ The following message appears:



⇨ The system switches to the **Diagnostic** mode.

At the Unit

► Attach the grid if necessary.

Cleaning and Disinfecting

For information on how to clean the Eleva Workspot, refer to the Instructions for Use CombiDiagnost R 90.

Product Disposal

Philips is committed to protecting the natural environment, and ensuring continued safe and effective use of this product through proper support, maintenance and training. Therefore Philips products are designed and manufactured to comply with relevant guidelines for environmental protection. As long as the product is used and maintained properly, it presents no environmental risks. However, the product may contain materials which could be harmful to the environment if disposed of incorrectly. Use of such materials is essential for the product's functions and its compliance to the statutory and other requirements.

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Final Disposal of the Product

Final disposal is when the user disposes of the product in such a way that it can no longer be used for its intended purposes.

The return, proper disposal and recovery of the medical device take place in accordance to the European WEEE Directive (Waste Electrical and Electronic Equipment) and/or to the respective requirements of national legislation.

Philips manufactures state-of-the-art medical equipment in terms of safety and environmental protection. Assuming no parts of the system housing are opened and the system is used properly, there are no risks to people or the environment.

CAUTION

Do not dispose of any parts of this product as industrial or domestic waste. The product contains hazardous materials which require special disposal. Incorrect disposal of any of these materials may lead to serious environmental pollution.

Philips supports you in the following:

- Recovery of reusable parts (for example, detector, workstation, X-ray tube).
- Recycling of useful materials by competent disposal companies.
- Safe and effective disposal of the product. For advice and information, contact customer service first or the manufacturer.

For more information on the Product Recycling Passport go to:
http://www.philips.com/recycling

Passing the Product on to Another User

If this product is passed to another user, it must be in its complete state, including all product support documentation.
Make the new user aware of the support services that Philips provides for installing, commissioning and maintaining the product.

Before passing on the product or taking it out of service, all patient data must be (backed up elsewhere if necessary, and) deleted from the product.

Disk Sanitization

The system is not equipped with a special-purpose disk sanitization software. In order to achieve disk sanitization in a way that meets your security or privacy requirements, consult your local IT department and consider one or more of the following actions:

- Physically destroy the system's build in disk considering standard documents like NIST SP800-88.
- Mount the system's disk into a regular PC for use of the “ATA Secure Erase” feature of the BIOS.

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- Engage a Philips service engineer to install the system disk from scratch. By performing a from-scratch installation, all disk partitions are overwritten with the default partition images, that means all former Bitlocker KeyProtectors are replaced and the entire encrypted partition is re-encrypted with new cryptographic keys. The service tool displays the encryption progress, which should reach 100% to complete the sanitization.
- If applicable, destroy or invalidate any existing recovery password.

It must be remembered by all existing users that passing on medical electrical products to new users may create serious technical, medical and legal (for example, privacy) risks. Such risks can arise even if the product is given away. Existing users are strongly advised to seek advice from their local Philips Medical Systems representative before committing themselves to passing on any product. Alternatively, they may contact the manufacturer.

Once the product has been passed on to a new user, a previous user may still receive important safety-related information, such as bulletins and field change orders. In many jurisdictions, there is a clear duty on the previous user to communicate such safety-related information to new users. Previous users who are not able or prepared to do this should inform Philips about the new user, so that Philips can provide the new user with safety-related information.

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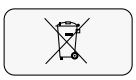
Replacing and Disposal of Batteries

For safe operation, replace the batteries of the remote control for the RF viewer at regular intervals.

Replacing the Batteries

- ► Unscrew the three screws using a Phillips screwdriver to open the battery compartment cover on the rear side of the remote control.
- ► Remove the old batteries.
- ► Insert new batteries type AA in the position indicated in the battery compartment.
- ► Fasten the three screws using a Phillips screwdriver to close the battery compartment cover.

Disposal of Batteries



- ► Dispose of the batteries according to the local environmental regulations.

REACH Requirements

REACH requires Philips to provide chemical content information for Substances of Very High Concern (SVHC) if they are present above 0.1% of the product weight. Components within electric and electronic equipment may contain phthalates above the threshold, for example, bis(2-ethylhexyl)phthalate, CAS no. 117-81-7). The SVHC list is updated on a regular basis. Please refer to the following Philips REACH website for the most up-to-date list of products containing SVHC above the threshold: http://www.philips.com/about/sustainability/reach.page

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15 Technical Data

General Data

Ambient Conditions

In Operation

Temperature	Relative humidity	Air pressure
+10°C to +40°C (+50°F to +104°F) (computer and monitor)	20% to 80% (computer) 15% to 85% (monitor)	700 hPa to 1,060 hPa (computer and monitor)

In Transport and Storage

Temperature	Relative humidity	Air pressure
–25°C to +70°C (–13°F to 158°F)	5% to 95%	700 hPa to 1,100 hPa

Power Supply

Mains voltage (Computer and monitor)	100 V – 240 V
Mains frequency (Computer and monitor)	50 Hz/60 Hz

Operator's Console

Computer	Mini-Tower
Maximum power consumption	310 W
Interfaces	- CAN - DVI - Ethernet port - USB port
Operating frequency	3.1 GHz
RAM	2 x 8 GB
Solid state drive	960 GB (800 GB free for storage)

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Drive	DVD+/-RW
Weight	14.5 kg (32 lb)

Monitor MIFC-2121TP (B)	In control room
	In examination room
	21.3" touch screen and non-touch screen 0.270 mm × 0.270 mm pixel size Resolution 1600 × 1200, color
	Monitor can be tilted from -45° to +5°.
Luminance	DICOM calibrated 400 cd/m²
Video connector	HDMI 1.2
	Display Port 1.2
	VGA
Power consumption	Maximum 60 W
	5 W (stand-by)
Weight	7.0 kg (15.4 lb) without stand
	8.8 kg (19.4 lb) with stand
Dimensions (W × H × D)	493 mm × 429 mm × 234 mm (19.4 in × 16.9 in × 9.2 in) with stand
	493 mm × 385 mm × 86 mm (19.4 in × 15.2 in × 3.4 in) without stand

For the examination room, the system is delivered with either the monitor MIFC-2121TP or the monitor CML21-PHE. The monitor type can be found on the labels on the rear side of the monitor.

Monitor CML21-PHE	In examination room
	21.3" non-touch screen 0.270 × 0.270 mm pixel size Resolution 1600 × 1200, color
	Monitor can be tilted from 0° to -15°.
Luminance	DICOM calibrated 500 cd/m²
Video connector	DVI-D
Power consumption	46 W at 400 cd/m²

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Weight	7.1 kg (15.7 lb)
Dimensions (W x H x D)	495 mm x 425 mm × 108 mm (19.5 in × 16.7 in × 4.3 in)

Connecting an External Video Source

External video sources can be connected to the monitor in the examination room with one of the following cables:

- Directly with external cable
- With DVI cable set provided by Philips inside the monitor ceiling suspension or monitor trolley

Only connect video sources that are medical devices. Philips is not responsible for the function of the external equipment or for the performance of the established video link.

If the video source is connected through Philips DVI cable set, the DVI port of the video source must provide +5 V supply voltage for the Philips adapter.

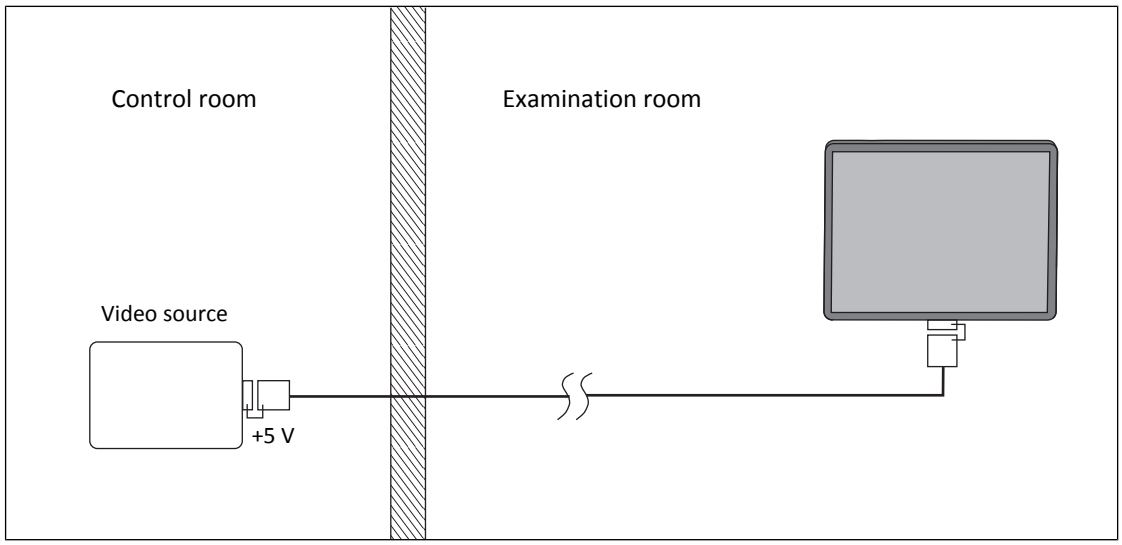

Fig. 25: Video source with DVI cable set

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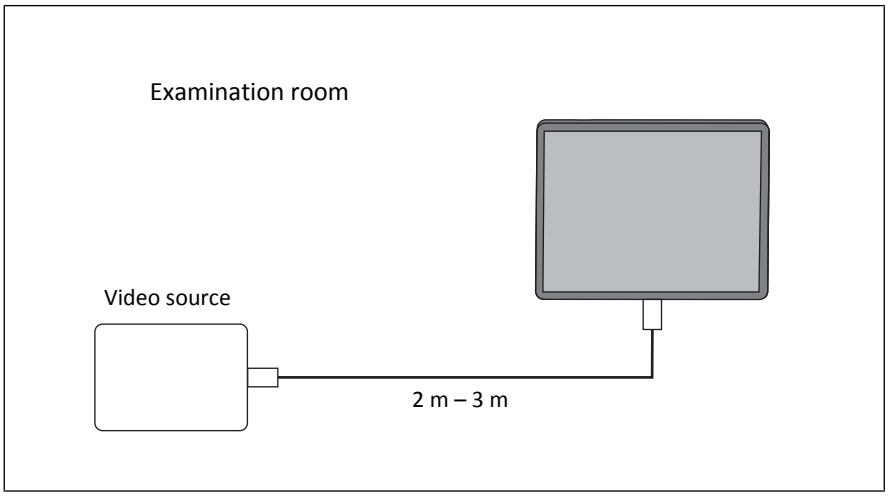

Fig. 26: Video source directly connected with external cable

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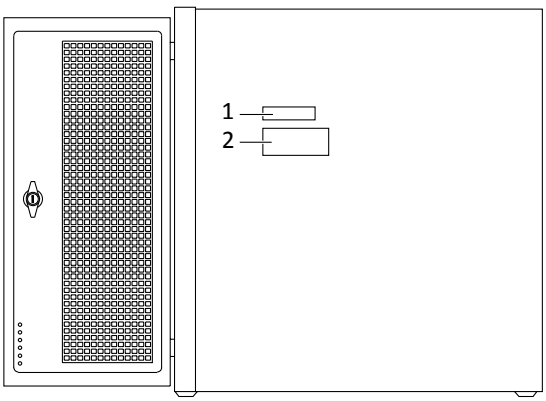
Labels

Computer



No.	Contents	Contents
1		Technical data
2		Component label
Not shown	On rear side:	Interface overview

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Monitors

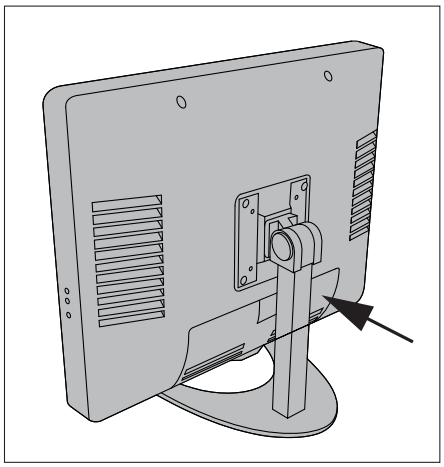

Fig. 27: Monitor without on/off-buttons

Label	Contents
	Component label

For further information regarding the labels, see the separate documentation of the legal manufacturer.

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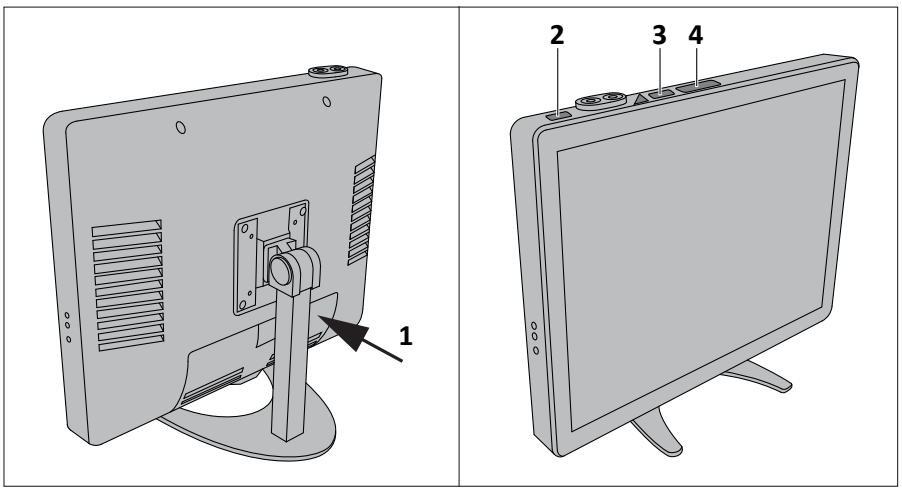

Fig. 28: Monitor with on/off-buttons

No.	Labels	Content
1		Component label
2		FDA, if applicable
3		Country-specific warning label
4		Country-specific warning label

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16 Accessories for Stitching (Optional)

Radiography

For Your Safety

WARNING

Use only accessories for this unit that are approved by Philips for such use.

NOTICE

For installing any accessory, use its locking device and make sure that the accessory is fixed safely.

Patient Support

Safety Instructions

CAUTION

Before positioning the patient on the patient support, lock the front wheels. This prevents the patient support from rolling away.

CAUTION

When transporting the patient support, do not run over other persons' feet.

CAUTION

Use the patient support only on a level floor.

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CAUTION

- **The stitching ruler and the anatomy are not on the same plane. Therefore, they have different magnification factors on the detector. Calibrate each image (including the composite image) by using a calibration object in the plane of interest (see section “Calibration and Measurements”). After calibration, all measurements are related to the dimensions defined with this calibration. Do not use the stitching ruler for calibration.**
- **Use only the Philips stitching ruler for stitching procedures. It can be ordered in the catalog. By using other stitching rulers, the failure rate of the automatic stitching may increase. Manual correction may be required then.**

Normal Use

The patient support is used to position and support the patient with multiple exposures during the stitching examination at the wall stand.

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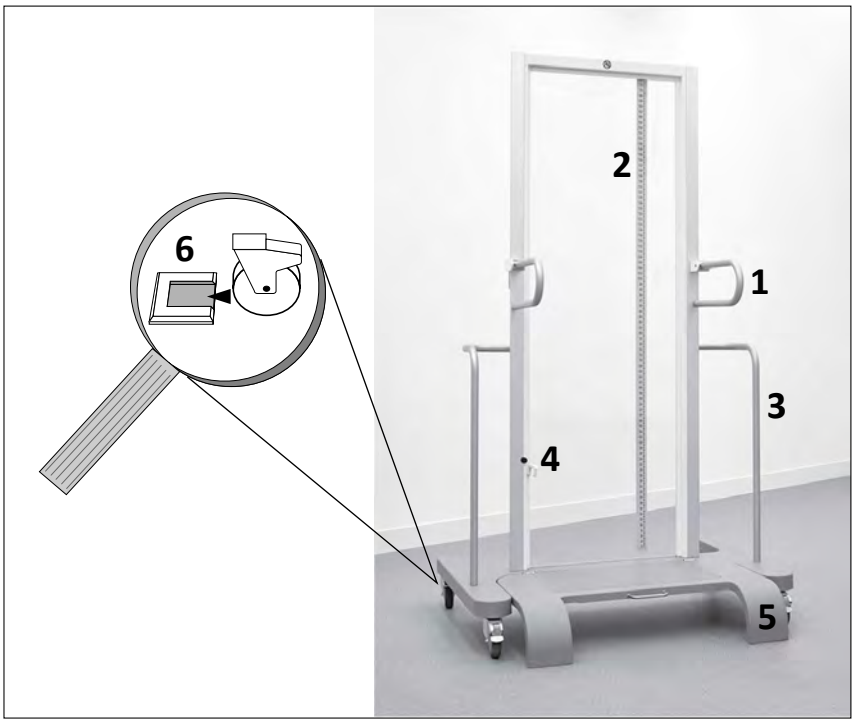
Legend



No.	Meaning
1	Movable patient grip
2	Stitching ruler (detachable)
3	Transport grip
4	Hook for holding the folded up footplate
5	Footplate
6	Metal fasteners (installed on the floor)

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Operation

CAUTION

Risk of injury

When transporting the patient support, make sure that the footplate is folded up and the hook is locked securely in place.

If the footplate is not correctly secured, it may flip down and cause injury to the patient or operator.

Folding Up the Footplate

- Fold up the footplate and lock the hook securely into place.

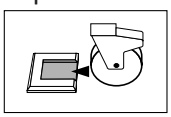
Folding Down the Footplate

- Unlock the hook and fold down the footplate.

Fixing the Wheels In the Metal Fasteners

Metal fasteners are installed on the floor to fix the patient support in a defined position in front of the wall stand. This ensures that the detector can move up and down freely during the stitching examination.

- Clip the wheels of the patient support securely into the metal fasteners.



Replacing the Stitching Ruler

- Release the knurled screw.
- Replace the stitching ruler.
- Tighten the knurled screw.

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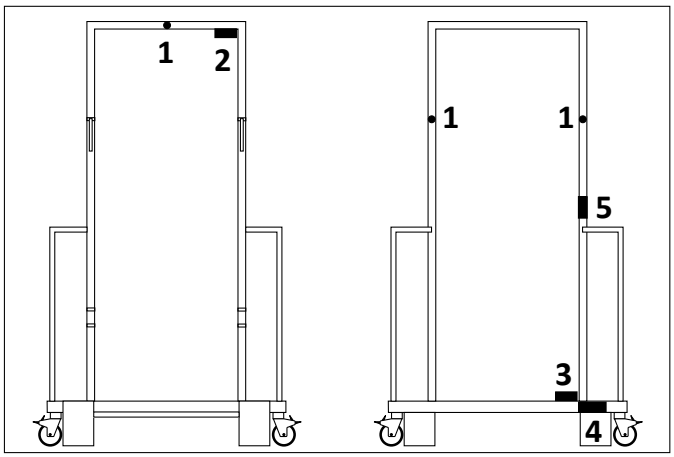
WARNING

Use only accessories for this unit which are approved by Philips for this unit.
For further accessories, see chapter “Accessories” in the Instructions for Use.

Equipment Data

Height	1990 mm (78.4 in)
Width	1110 mm (43.7 in)
Length	881 mm (34.7 in)
Weight	65 kg (143.3 lb)
Max. load	225 kg (496 lb)
Al equivalent	< 1.0 mm

Labels



No.	Contents	Meaning
1		Do not push at the top of the patient support – the patient support may tilt over.
2		Al equivalent
3	Makrolon plate	Catalog number & serial number

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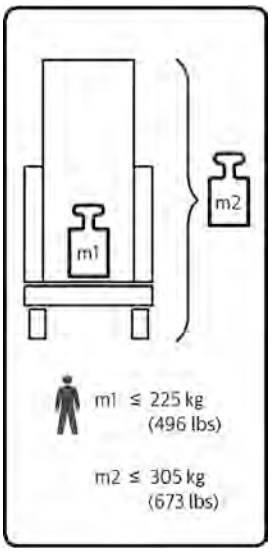
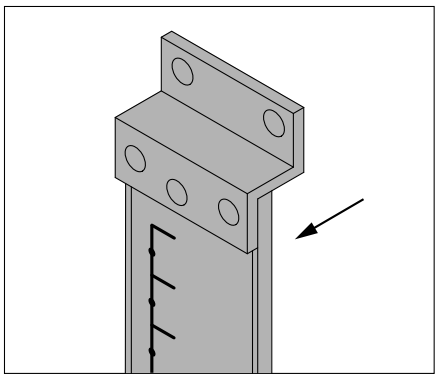
No.	Contents	Meaning
4		Accessory label
5		Max. load and weight: • m1 ≤ 225 kg (496 lb): max. patient load on the Patient Support • m2 ≤ 305 kg (673 lb): m1 + weight of the Patient Support + accessories

Labels Stitching Ruler



Label	Meaning
	Accessory label

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Movable Patient Grip

Normal Use

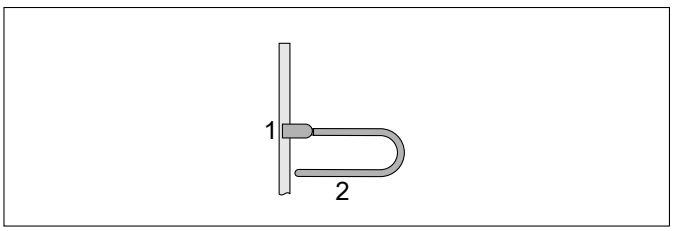
The grip is suitable for supporting the patient in the correct position at the patient support.

Prohibited Use

Do not use the grip as an aid for getting on the patient support.

Do not use the grip for transporting the patient support. Use only the transport grip for transport.

Legend



No.	Meaning
1	Clamp
2	Grip

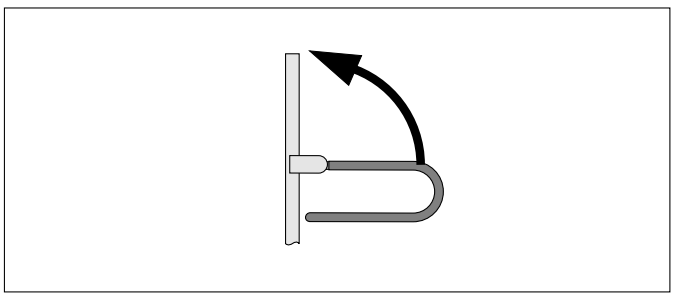
Operation

CAUTION

Risk of trapping fingers!

When adjusting the grips, make sure not to trap your fingers.

1



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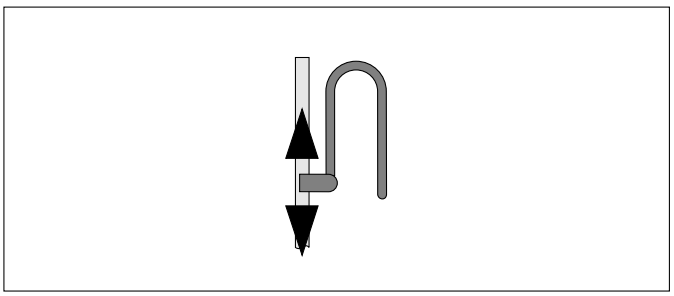
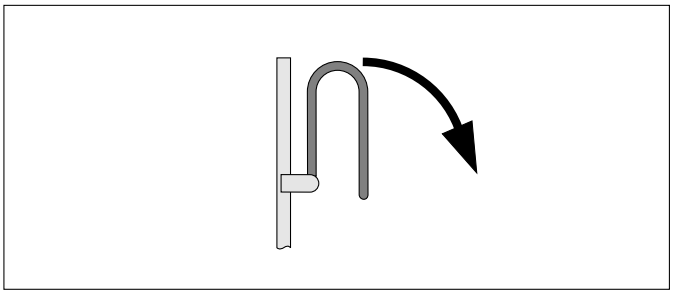
2



3



Installing

CAUTION

Risk of trapping fingers!

When adjusting the grips, make sure not to trap your fingers.

WARNING

There is a grip for installation at the right rail of the patient support and a grip for installation at the left rail. If you install a grip to the wrong rail of the patient support, it cannot lock properly and may fall on your feet. To properly install a grip, unlock it upwards (step 1 in the picture below) and check if it fits on the left or on the right rail. Then you may proceed with step 2.

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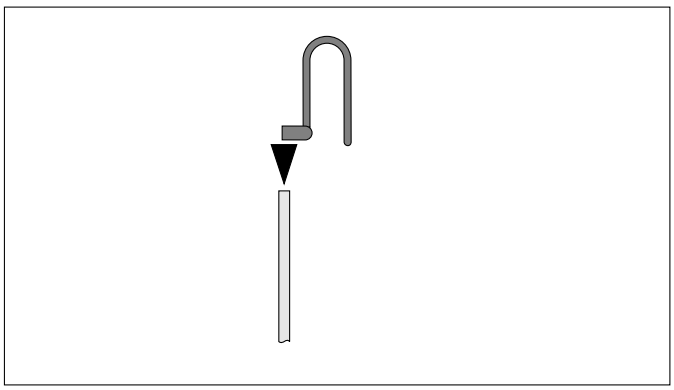
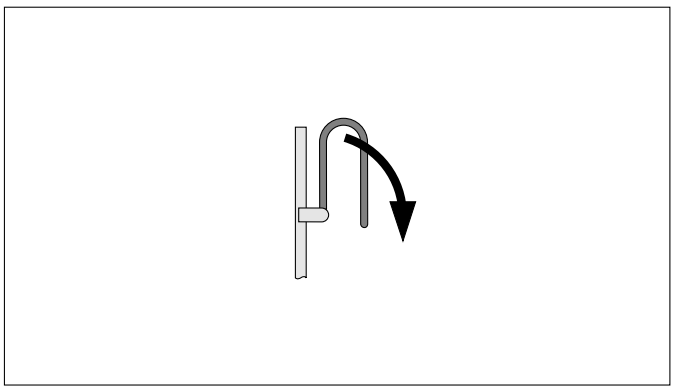
1



2



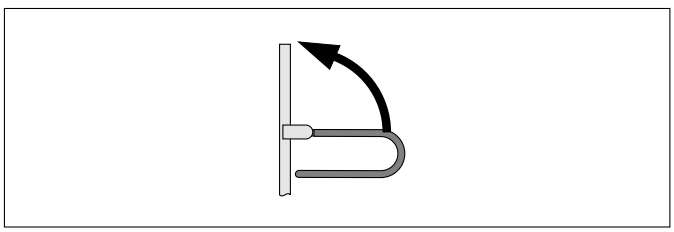
Dismantling

CAUTION

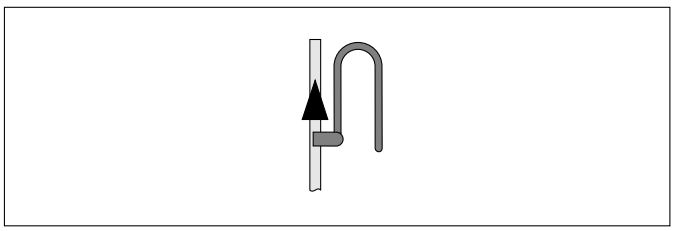
Risk of trapping fingers!

When adjusting the grips, make sure not to trap your fingers.

1



2



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Adjustable Straps for Patient Support

Normal Use

The adjustable straps are suitable for the following purposes:

- Immobilizing the patient for radiography
- Securing the patient in a safe position

The straps are closed with hook-and-loop tape (Velcro).

CAUTION

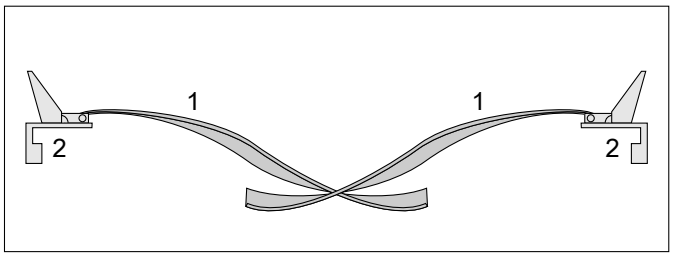
The patient can easily loosen the adjustable straps. Therefore, you must continue to watch him/her after you have secured the tape.

Prohibited Use

The adjustable straps are not suitable for the following actions:

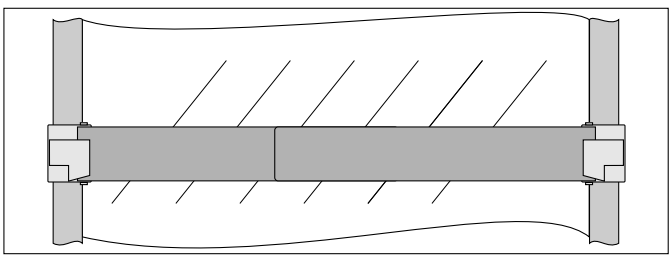
- Getting on the patient support
- “Strapping down” patients

Legend



No.	Meaning
1	Belt
2	Clamp

Front view



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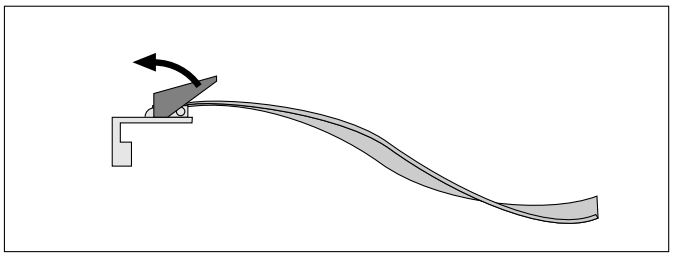
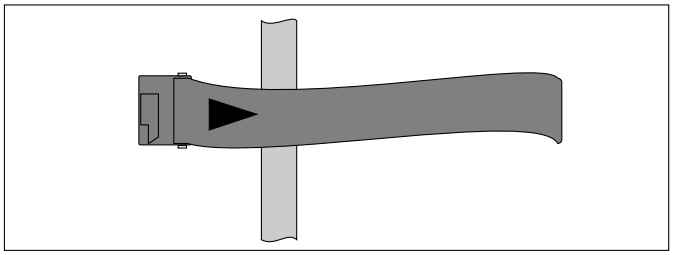
Installing

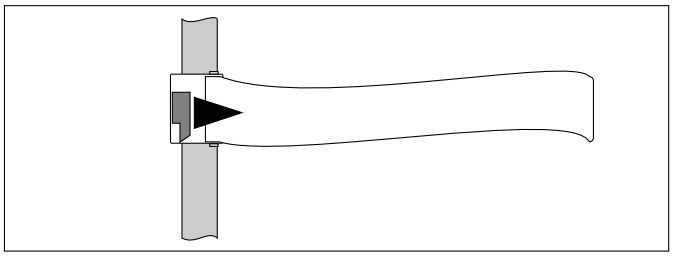
1



2

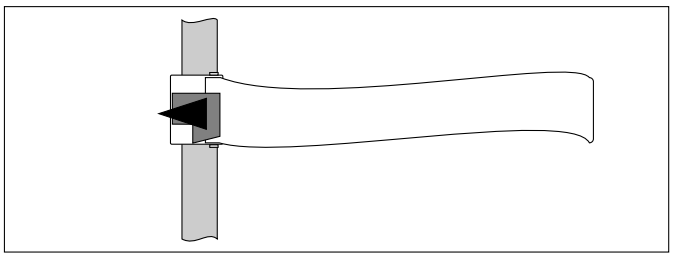


3

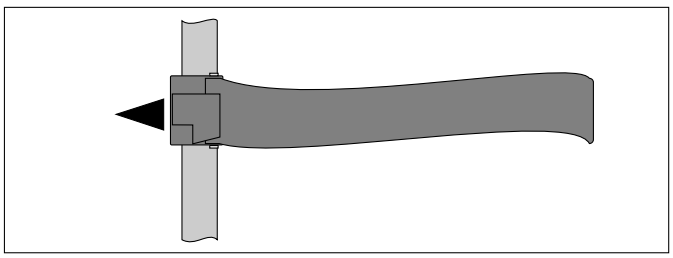


Dismantling

1



2



Operation

- Tension two halves of belt over patient and press Velcro tapes together.

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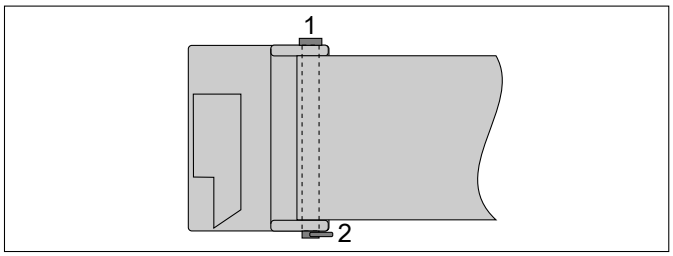
Detaching the Belt



No.	Meaning
1	Bolt
2	Locking ring

- Remove locking ring.
- Pull out bolt.
- Detach belt.

Attaching the Belt

- Push the bolt through the flap.
- Attach the locking ring.

Technical Data

Length	
– max.	1280 mm
– min.	720 mm
Width	73 mm
Weight	1.2 kg (2.6 lb)

Compatibility

Patient support

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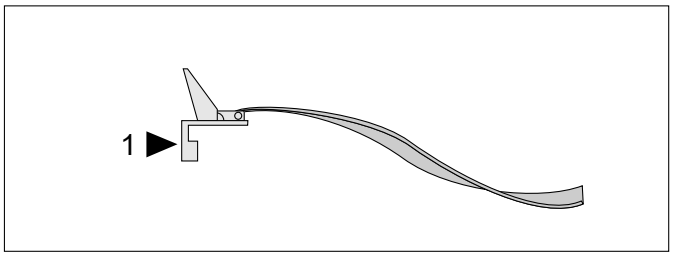
Labels



Label	Meaning
	Accessory label

Further Accessories

You can use the hand grips and the shoulder supports with the stitching support as well. For further information regarding these accessories, see the system instructions for use.

Spot Images

Stitching Ruler for Parallel Stitching on the Table

Normal Use

With the aid of the stitching ruler, you can easily recognize wrongly stitched composites when performing stitching examinations for legs.

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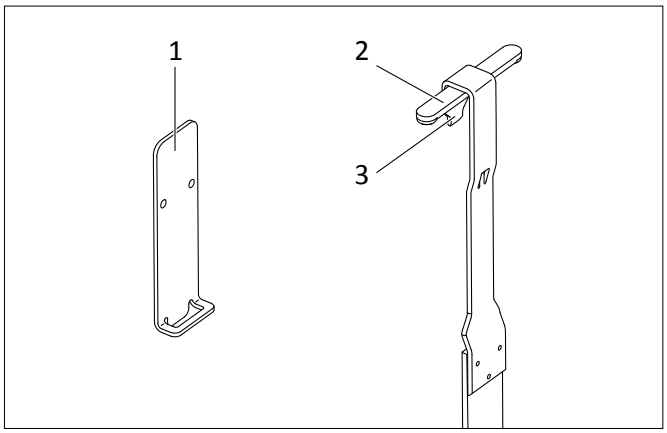
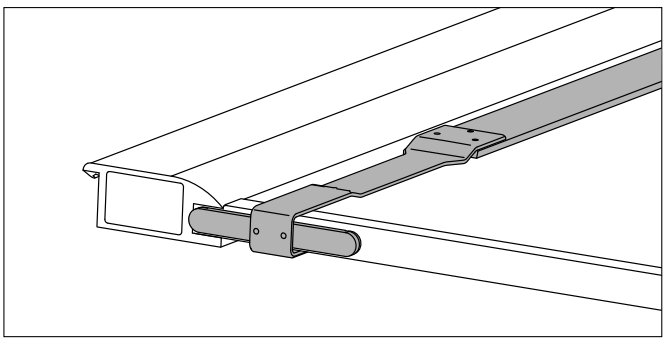
Legend

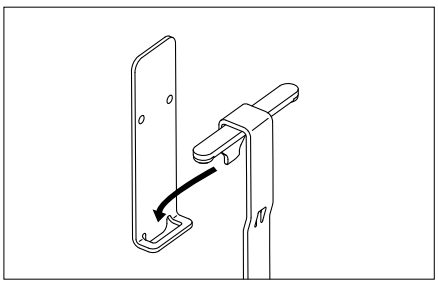


No.	Meaning
1	Holder for the stitching ruler
2	Guide bar of the stitching ruler
3	Hook of the stitching ruler

Operation



- ► Hook up the stitching ruler at the end of the table top.
- ► To position the stitching ruler, move the stitching ruler along the end face of the table top.



- ► Always park the stitching ruler in the holder when the stitching ruler is not used.

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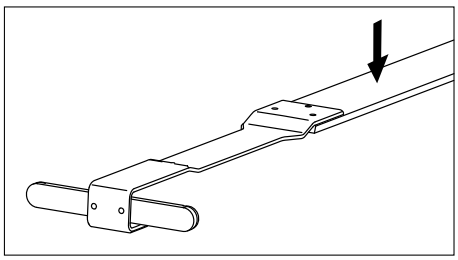
Technical Data

Length	2020 mm (79.5 in)
Width of the guide bar	110 mm (4.3 in)
Width of the ruler	40 mm (1.6 in)
Weight	1 kg (2.2 lb)

Labels



Label	Meaning
	Accessory label

Handle

Safety Instructions

WARNING

Risk of person falling down

If the patient stands on the footrest, for example, for stitching examinations, always install two handles. The handles are intended to support stability safety for the patient.

WARNING

Risk of person falling down

The maximum load for each handle is 50 kg (110 lb).

Do not tilt the table in Trendelenburg position when the handle is in use. The handle should not be used to support the patients weight.

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NOTICE

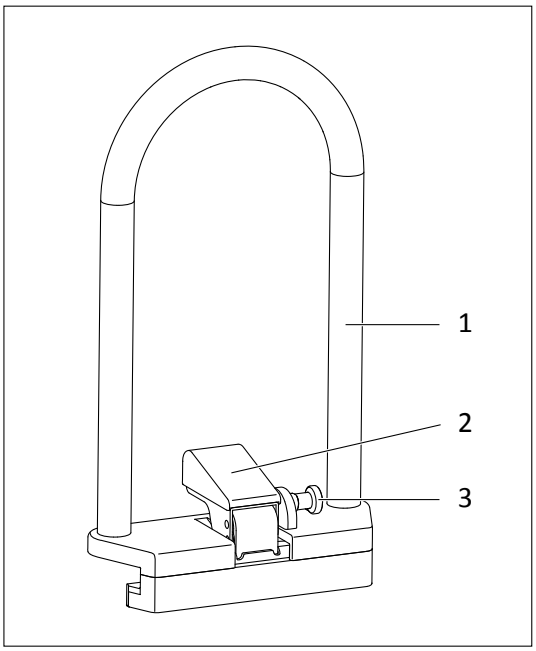
If the table is tilted, hold the handle with your other hand when you open the clamp of the handle.

Normal Use

During the examination, the handle supports the patient to stand safely, for example, on the footrest.

A single handle can be used as stretch grip for lateral chest exposures. Use two handles to stabilize the patient during stitching examinations, especially when performing stitching examinations with legs.

Legend



No.	Meaning
1	Grip
2	Clamp
3	Knob

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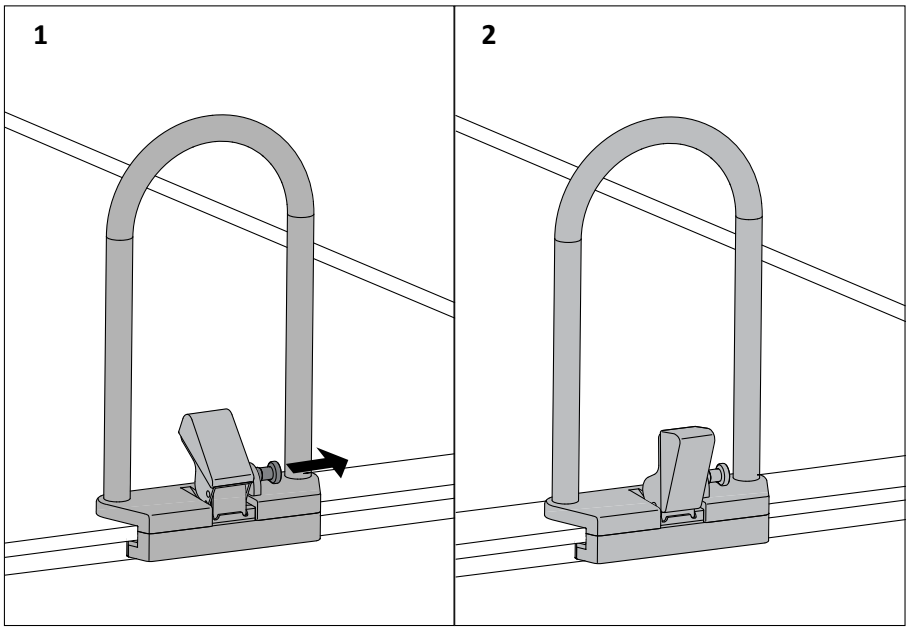
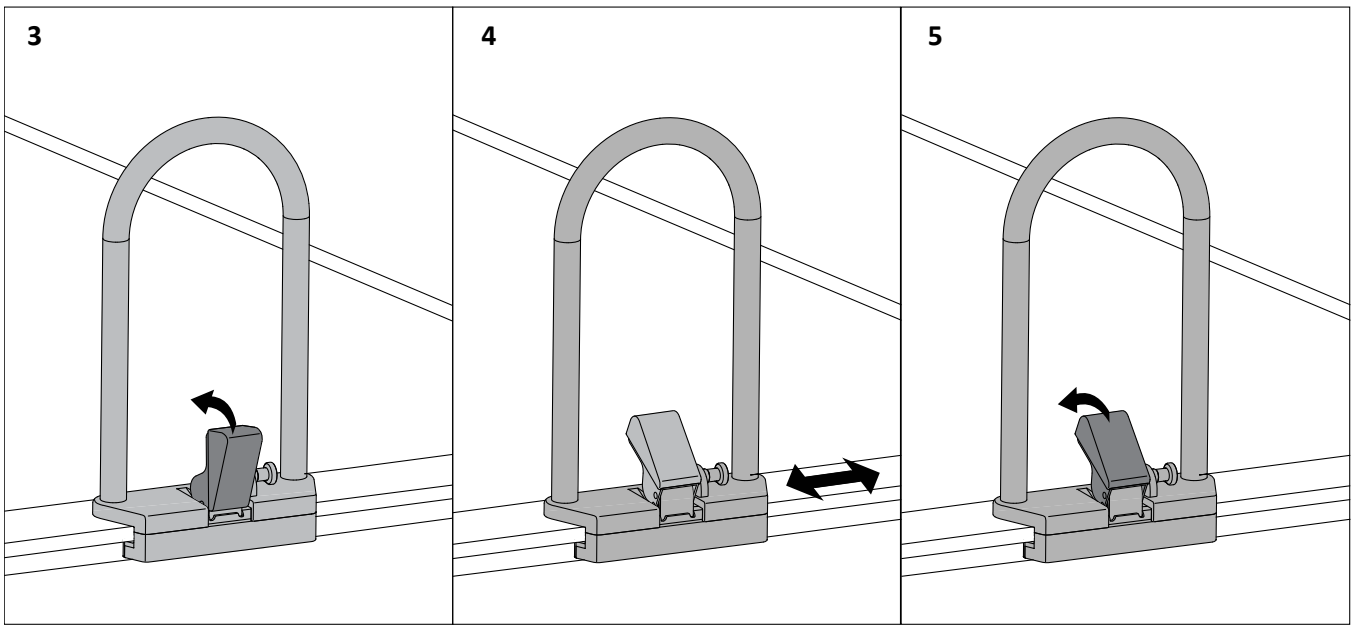
Installing



▷ Make sure, that the clamp is in vertical position (2).

► If the clamp is not in vertical position, pull the knob (1).



► Place the handle at the rail of the table top.

► Push the clamp halfway down (3).

⇨ The handle can be moved along the rail (4) to the required position.

► Close the clamp (5) completely.

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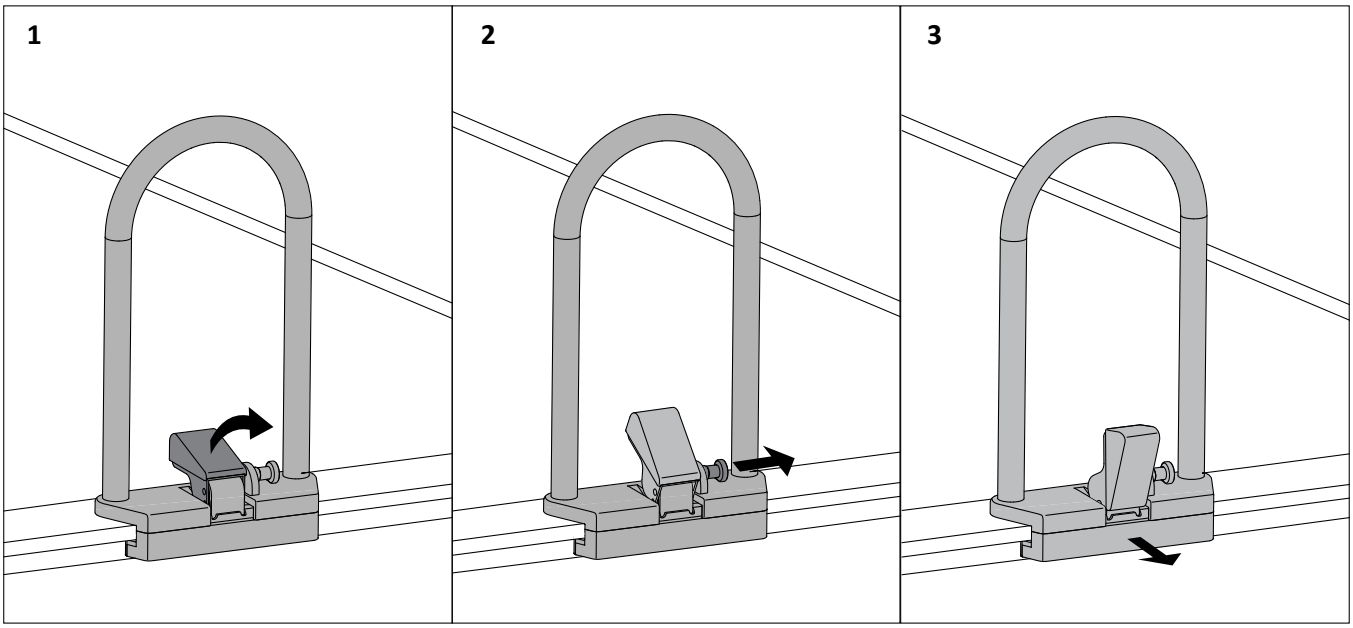
Dismantling



- ► Pull the clamp (1).
- ► Pull the knob (2).
- ⇨ The clamp opens completely.
- ► Remove the handle (3).

Technical Data

Height	420 mm (16.5 in)
Width	230 mm (9.1 in)
Weight	2.6 kg (5.7 lb)

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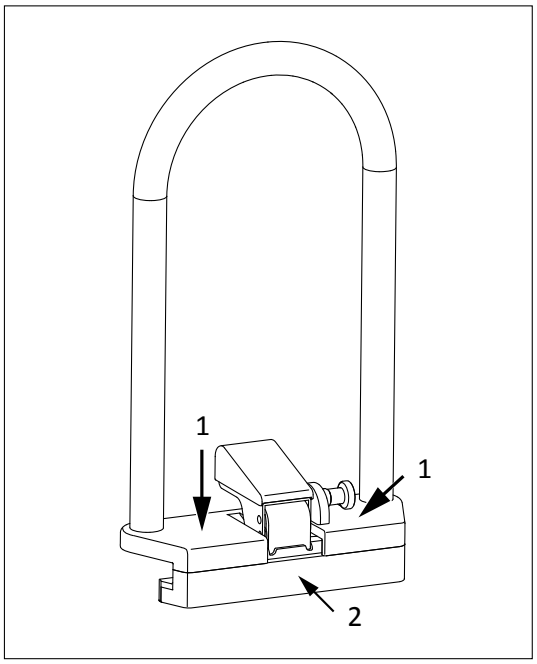
Labels



No.	Contents	Meaning
1		Maximum load
2		Accessory label

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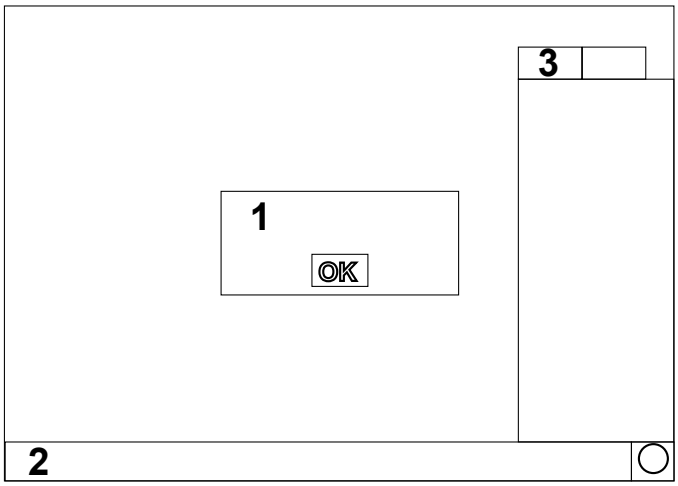
17 Appendix

Messages

The illustration shows where the system messages appear on the screen (1, 2, 3).



Some of these messages require confirmation.

Message	Possible causes	What can be done
“demo” is not a valid user name.	“demo” was entered as a new user name. The name “demo” is a reserved name and cannot be entered here.	Try a different user name.
“Emergency” is not a valid user name.	“Emergency” has been entered as a new user name.	Enter a different name for the new user.
2nd tube enters safe zone	The user has moved the ceiling suspension away from the table. In this position the table can be moved without danger of collision.	-
2nd tube leaves safe zone	The ceiling suspension has entered the table zone. In this position the table cannot be moved to avoid collision.	-
A blank password is not allowed on encrypted systems. Define a valid password.	You have tried to set a blank password for a user account. Disk encryption is enabled on the system.	Enter a valid password.
A button (“...”) sticks at the control handle. Press the sticking button several times to make it operate again. Call service, if the button continuously causes problems.	Upon start-up, a continuously active button has been detected at the X-ray tube control handle. The corresponding function cannot be executed.	Press the sticking button several times to make it operate again. Call service, if the button continuously causes problems.

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Message	Possible causes	What can be done
A detector calibration is due now. Please start a calibration as soon as possible!	This is a reminder that the next detector calibration needs to be carried out for continued optimum image quality.	Perform a detector calibration at the earliest convenience, preferably within the same day.
Adjustment program is running ...	An adjustment program has been started on the generator.	-
A DVD has been inserted. DVD is not a supported media type for writing. For writing to media you need to insert a CD.	A DVD medium has been inserted into the CD/DVD drive. Writing images to DVD is not supported.	Remove DVD and insert a CD.
After changing the bar code linking mode client workspots cannot connect to the server workspot anymore.	The bar code reader mode was changed. This means that other workspots in the cluster cannot use this workspot as a bar code server.	Press OK to confirm the change, press CANCEL to discard the change.
A grid is inserted!	-	-
A grid is put on!	The exposure program is set for using no grid, but a grid is put on the portable detector.	Remove the grid or adapt the technique factors accordingly.
A heavy shock occurred at the portable detector ("...") at "...". This shock might influence the image quality. Further actions are required. Refer to the Instructions for Use.	The detector has received a heavy shock (for example, it has fallen down or hit an object).	For detailed information see the according chapter in this document.
Always enter a user name.	A new user has been added to the system or an existing one has been modified.	Type a user name.
A medium shock occurred at the portable detector ("...") at "...". This shock might influence the image quality. For further information refer to the Instructions for Use.	The detector has received a medium shock (for example, it has fallen down or hit an object).	For detailed information see the according chapter in this document.
An export to destination "..." failed. Please check the job queue.	Wrong export node configuration, network problem, or PACS down.	The administrator should check the network and PACS system. If the problem persists, call service.
An image has been received that cannot be mapped to the correct patient. Click YES to add the image to the currently selected view. Click NO to create a patient "Image Recovery".	The detector has been re-connected and is trying to send an image. You need to define where to add the image.	When you select YES, the image will be added to the selected view. When you select NO, a patient "Image Recovery" will be created in the patient list.
An image processing protocol with manual ranger mode should not be saved because it shall not be used on clinical images. Click YES to save the protocol anyway. Click NO to cancel the operation.	You are about to save an image processing protocol while the ranger is active in manual mode. This is caused, for example, by using the simple ranger tool.	Click YES to continue saving the protocol or NO to discard saving the protocol. The ranger mode can be changed in the ranger panel.

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Message	Possible causes	What can be done
An image processing protocol with this name already exists! Do you want to overwrite this protocol?	The image processing protocol name entered already exists.	Press YES to overwrite the existing protocol, press NO to enter a different name.
An image retrieval from archive "..." failed	Images could not be retrieved from the indicated archive. Possible causes: PACS not available, network problem, insufficient storage space	Retry. Have the network, the PACS and the hard disk space checked. If problem remains, call service.
A patient "Image Recovery" has been created in the patient list. Move the image from the patient "Image Recovery" to the correct patient.	-	-
Area Scan - no auxiliary selection possible	The selected special procedure program for Area Scan can only be used with auxiliary Fluoroscopy and spot images.	Select a different exposure program.
A regular system maintenance is due now. Please call service.	A suggested regular maintenance is due now.	Have regular maintenance on the system as soon as possible.
A remote software installation has failed. The previous software version was re-installed successfully. This message will be shown on every startup until an advanced user logs in.	-	-
A software update is available. The advanced user can start the installation.	A software package has been downloaded from remote center and is ready for installation.	Login as advanced user and install the update.
A stitching part image is about to be moved. This action will delete the existing composite image. Do you want to proceed with the movement?	A stitching part image is about to be moved. You are required to confirm the deletion of the existing composite image.	If you want to delete the existing composite-image, click OK. If you don't want to delete existing composite-image, click CANCEL.
A system integrity check related to the user administration failed. All further user logins (except emergency and service login) are blocked. The system software must be re-installed.	-	-
A system update is pending.	A system update was downloaded and can be installed.	The advanced user should install the update at the earliest convenience.
Attachment of new detector is not possible. Maximum number of portable detectors is reached. Call service.	The maximum number of portable detectors is reached.	Use a detector that has already been used at this system or call service.

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Message	Possible causes	What can be done
Attachment of the detector to this system is not possible. Images acquired at system "..." have not been read out yet. They must be read out at that system first. If you are sure that the images are not needed anymore, restart the detector.	A detector with one or more images acquired at another system cannot be attached.	Readout the images at the other system or switch detector off and on again to delete the images. Retry attachment.
ATTENTION - The Image is not blank. Remove any objects from the X-ray field and release exposure again. If the problem persists, confirm the message and continue the calibration anyway.	The first calibration image cannot be used as there might be an object inside the X-ray field.	Remove any objects from the X-ray field. If the problem persists, confirm the message and continue the calibration anyway.
Auto confirmation of the current acquisition is disabled now.	When the user presses the viewport during the read-out phase the auto confirmation mode is disabled for this image. The user guidance indicates that the auto confirm mode is interrupted correctly.	-
Automatic run aborted by error	A tomography or stitching run or testrun was aborted because an error has occurred while moving (for example, a collision).	Manually move the source assembly back into the start position. Retry. If problem persists, call service.
Automatic tube tracking has switched off.	The tracking servo drive has switched off, possibly because the operating range was left or because of a collision.	Tracking can be switched on again if the reason for automatic switch-off is no longer present.
A wrong antiscatter grid has been inserted! It will not be possible to remove grid line artifacts from the image.	The inserted antiscatter grid line density is not compatible with the grid line removal algorithm.	Exchange the grid.
Background RIS query: worklist has been updated	Your worklist was automatically updated by a backgroud RIS query.	-
Be aware that this geometry position might be assigned to several views. This action will delete the stored geometry coordinates. It cannot be reverted. Do you really want to delete the selected geometry position coordinates?	User pressed the DELETE button in SYSTEM COMPONENTS SELECTION AND ADJUSTMENT section.	If you really want to delete the selected geometry position's coordinates, click YES. If you want to keep the selected geometry position's coordinates, click NO.
Calibration successfully finished.	The calibration has been be performed with valid results and calibration data have been stored.	-
Call service. The software of the component that was just installed is not compatible with the software of the system. Do not use the system on patients. Related components: "..."	An external component has a software version installed that is not compatible with the software of the system.	Call service to update the software of the related components.

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Message	Possible causes	What can be done
Call service - "..." is not responding.	The control handle display is not responding.	Restart the system. If the problem persists, call service.
CALL SERVICE - A focal spot has not been adapted.	A focal spot has not yet been adapted. This may result in prolonged preparation time and inaccurate X-ray technique factors.	Call service immediately!*
CALL SERVICE - A focal spot is not operable!	A focal spot is not operable.	Call service immediately!*
CALL SERVICE - A temporary license has expired! Please check the license status list. Show this message again upon the next system start?	A temporary license is no longer valid. This may affect the whole system or parts of it.	Under "System/General/License status" you can see the license status of the system. Call service, if you want to renew the expired license.
CALL SERVICE - A temporary license will expire in "..." days! Please check the license status list.	Soon a temporary license will no longer be available. This may affect the whole system or parts of it.	Under "System/General/License status" you can see the license status of the system. Call service, if you want to renew the expired license.
CALL SERVICE - A temporary license will expire in "..." days! Please check the license status list. Show this message again upon the next system start?	-	-
CALL SERVICE - A temporary license will expire today! Please check the license status list. Show this message again upon the next system start?	A temporary license will no longer be available after today. This may affect the whole system or parts of it.	Under "System/General/License status" you can see the license status of the system. Call service, if you want to renew the expired license.
CALL SERVICE - Bucky wall stand error!	-	-
CALL SERVICE - Bucky wall stand error!	An error has occurred in the wall Bucky stand subsystem.	Call service immediately!*
CALL SERVICE - Ceiling suspension motor drive error!	-	-
CALL SERVICE - Could not select exam, no matching APR data found!	No matching exposure program was found for the selected examination.	Call service immediately!
CALL SERVICE - CS source collimator error!	An error has occurred in the ceiling suspended X-ray source collimator.	Call service immediately!*
CALL SERVICE - CS source radiation filter error!	-	-
CALL SERVICE - Digital flat detector error!	An error has occurred in the digital flat detector.	Call service immediately!*
CALL SERVICE - Error in image processing protocol. Referenced protocols are missing.	Image processing protocols have been removed or renamed.	Check all invalid image processing protocols with EVA configuration tool.

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Message	Possible causes	What can be done
CALL SERVICE - Error in the examination programming database	An error occurred in the examination programming database.	Call service.
CALL SERVICE - Exposure handswitch error!	An error has occurred at the exposure hand switch, for example, during the switch on procedure the hand switch might have been pressed down.	Make sure that the hand switch is not pressed during power-on phase. If error persists, call service immediately!*
CALL SERVICE - Failed to load configuration data, default values have been set.	The workflow component could not load its configuration data file. This contains only data which can be set by the user in the “System” tab. This can be caused by a failed backup/restore process.	Manually restore the settings in the “System” tab. Call Service.
CALL SERVICE - Flat detector overheated!	-	-
CALL SERVICE - Foot switch error!	An error has occurred at the foot switch, e.g. during the switch on procedure the foot switch might have been pressed down.	Make sure that the foot switch is not pressed during power-on phase. If error persists, call service immediately!*
CALL SERVICE - Geometry error! Fluoroscopy might still be operating (with limitations).	Because of an error the system cannot connect to the geometry.	Call service. Fluoroscopy might still be operating (with limitations).
CALL SERVICE - Geometry position cannot be stored due to a ceiling suspension malfunction.	The ceiling suspension has a technical problem.	Call service.
CALL SERVICE - Geometry position cannot be stored due to a wall stand malfunction.	The wall stand has a technical problem.	Call service.
CALL SERVICE - Invalid application selected!	The selected application data set is invalid and cannot be used.	Try to select a different application. Call service immediately!
CALL SERVICE - Invalid exposure program!	The selected exposure program data set is invalid and cannot be used.	Try to select a different exposure program. Call service immediately!
CALL SERVICE - Invalid fluo flavour data!	The selected fluoroscopy data set is invalid and cannot be used.	Try to select a different fluoroscopy mode. Call service immediately!
CALL SERVICE - Invalid patient thickness correction!	The selected patient thickness data set is invalid and cannot be used.	Try to select a different exposure program or patient thickness. Call service immediately!
CALL SERVICE - Malware found! Ask Philips customer support for further assistance. System functionality might be affected.	The virus scanner has found a suspect item that might be infected.	Call service immediately!*
CALL SERVICE - No connection to the examination programming database	-	-
CALL SERVICE - No printer configured!	A report cannot be printed because there is no printer configured.	Call service immediately!

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Message	Possible causes	What can be done
CALL SERVICE - Portable detector could not be connected. The detector is not prepared to be shared.	Connecting the portable detector was not possible, because the detector is not prepared to be shared between systems.	Use another detector or call service.
CALL SERVICE - Portable detector could not be connected. The ID is already in use.	Connecting the portable detector was not possible, because a different detector had been previously registered with the same ID.	Use another detector or call service.
CALL SERVICE - Printer name error. A printer is referenced that is not configured for this system.	Printers have been removed or renamed by service.	Check all invalid printer name presets with EVA configuration tool. If needed, call service to configure printers properly.
CALL SERVICE - Print template error. A referenced print template is invalid or undefined.	Print templates were removed or renamed.	Check all invalid print templates with EVA configuration tool.
CALL SERVICE - Service partition on hard disc is corrupted. No data storage possible.	Exporting data to the service partition was not possible because the target destination seems corrupted. This can, for example, happen while exporting plate statistics.	Try to store the data on a USB memory stick. Call service immediately!
CALL SERVICE - System error!	There is a malfunction in the system.	Call service. *
CALL SERVICE - System is not stable, must be rebooted	The system state is unstable, a proper workflow may not be possible.	Reboot the system. If error persists, call service immediately!*
CALL SERVICE - The focal spot is not operable!	The selected focal spot is not operable.	Select other focal spot. Call service.
CALL SERVICE - The print configuration could not be loaded from the EPX server. Therefore only a minimal configuration was loaded.	An error occurred while loading the print configuration. Therefore only a minimal configuration was loaded instead.	Call service immediately!*
CALL SERVICE - The selected focal spot has not been adapted!	The selected focal spot has not yet been adapted. This may result in prolonged preparation time and inaccurate X-ray technique factors.	Call service immediately!*
CALL SERVICE - The short term license activation has terminated!	The short term license activation is no longer valid.	See in “System/General/License status” which licenses are affected. Call service, if you need a license that is no longer available.
CALL SERVICE - The system cannot export because no DICOM export target is defined for “...”.	The automatic export found no valid DICOM export target in the export destination settings under “System/Settings/Export destinations”.	The advanced user or customer service should check and properly configure the available DICOM export targets.
CALL SERVICE - Tube control handle error!	-	-

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Message	Possible causes	What can be done
CALL SERVICE - Value of exposed radiation dose is set to 0. The DAP chamber is defective.	The DAP chamber self test reports a defect.	Call service!
CALL SERVICE - Wall stand Bucky unit error!	An error has occurred in the wall stand Bucky unit.	Call service immediately!*
CALL SERVICE - X-ray generator error!	-	-
CALL SERVICE - X-ray tube grid switch defect! Dose increase!	-	-
Cannot execute request - other device selected!	While another auxiliary is active, most functions at the X-ray source control grip are disabled.	Select an exposure program or auxiliary for the ceiling suspended X-ray source.
Cannot link into DR stitching view!	It is not possible to link a bar code into a Direct Radiography stitching part image view.	Select a non-stitching view or a CR stitching part image view.
Cassette mode (no patient selected) cannot be activated!	The cassette mode (no patient selected) could not be activated, e.g. because of: - No user logged in - System in QA mode - A user guidance waiting for confirmation	- Login as user - Switch to diagnostic mode - Confirm any user guidance waiting
CAUTION: X-RAY TUBE OVERLOAD!	The X-ray tube overload limit is reached, but the X-ray tube protection setting allow further operation at the operator's risk.	For continuous tube protection, stop the exposure run and let tube cool down as needed.
Change exam: please select new examination type.	You are about to change the examination type for the selected examination.	Select the new examination type or deactivate this mode by pressing the corresponding button again.
Changes at the print configuration will only become effective after a system restart! Restart the system if you intend to print using the new settings.	Modification of print configuration (system tab) or modification of print template usage in EVA-Tool.	Restart the system.
Check that the X-ray source is properly aligned. Make sure to select the auxiliary that the X-ray source is pointing at!	Whenever a new view uses automatic exposure, the operator is required to confirm that the X-ray source is aligned on to the selected image receptor.	Check beam alignment and confirm the user guidance. Then select the correct corresponding auxiliary.
Click OK to proceed with the Electronic Noise Test. No exposure is required.	You have clicked on the Electronic Noise Test.	Proceed by clicking OK or cancel the activity.
Collecting information for problem report was not aborted. Click OK to restart the system.	Aborting the collection of information for the problem report has failed due to a technical error.	Restart the system.

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Message	Possible causes	What can be done
Collimator error. The switch to field size limitation mode has failed. Switch between the registration devices “Fluoro and spot images” and “Free cassette”.	The switch to field size limitation mode has failed due to a software error.	Switch between the registration devices “Fluoro and spot images” and “Free cassette”. If this does not work, restart the system. If the problem still remains, call service.
Collimator shutter error	-	-
Collimator shutter error. Select a different registration device and return to the initial registration device. If the error remains, call service.	The collimator shutter could not be adjusted due to an error.	Try selecting a different registration device and returning to the initial registration device. Alternatively try restarting the system. If the error remains, call service. Fluoroscopy might still be operational.
Collision danger - Detector directly above the tabletop	An automatic detector movement is not possible because the VM detector is positioned above the tabletop. There is a danger of detector - table collision.	Move the detector using the normal movement functions.
Collision danger - table too low	An automatic movement is prematurely stopped because there is a collision danger with the detector and the table. The target position cannot be reached.	Change e.g. the table height and try again.
Collision detected at the wall stand - Movement not possible.	The wall stand cover is pressed.	Make sure to release the wallstand cover.
Collision detected - Brakes released. Move system out of collision and click OK afterwards.	A collision happened during a geometry position movement. The brakes of the ceiling suspension have been released and the the automatic movement has been disabled. The ceiling suspension can be moved manually now.	Move the system out of collision. Then click OK to engage the brakes and to enable the automatic movement.
Communication problem with control handle display	Communication issue between control handle display and Eleva Workspot. The displayed data may be incorrect.	Reselect the patient or restart the system. If the problem persists, call service.
Communication problem with control handle display	Communication issue between control handle display and Eleva Workspot. The displayed data may be incorrect.	Reselect the patient or restart the system. If the problem persists, call service.
Communication problem with the control handle display. Reselect the patient or restart the system. If the problem persists, call service.	Communication issue between control handle display and Eleva Workspot. The displayed data may be incorrect.	Reselect the patient or restart the system. If the problem persists, call service.

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Message	Possible causes	What can be done
Communication problem with the control handle display. Reselect the patient or restart the system. If the problem persists, call service.	Communication issue between control handle display and Eleva Workspot. The displayed data may be incorrect.	Reselect the patient or restart the system. If the problem persists, call service.
Completing the patient or the examination is not possible for the following reason: "..."	Completing a patient or an examination with a stitching view that has no composite image or that holds a composite image which is neither confirmed nor rejected.	Open the stitching tool to manually create a missing composite image. Confirm or reject any composite image before proceeding.
Composer could not be started because "...". Call service.	Software/Configuration problem.	Internal error. Call service.
Connection to hospital network available	A connection to the hospital network has been (re-)established.	-
Connection to hospital network is lost	The connection to the hospital network has been interrupted.	Check cable connection or Wi-Fi connectivity.
Connection to the patient database lost! Restart the system.	The database connection was lost due to an internal error.	Restart of the system is necessary in order to avoid loss of data.
Context help activated	The context help mode has been activated. Pressing or clicking a screen element now shows a short explanation for that element.	Select context help again to switch mode off again or wait a few seconds for automatic switch off.
Control console ("...") is busy. Wait a few minutes. If this does not help, restart the system.	The control console is busy and is not responding.	Wait a few minutes. If this does not help, restart the system.
Control console ("...") is not connected. Restart the system.	The control console failed to startup and has been disconnected.	Restart the system and call service if the problem still exists.
Conversion of UNIQUE preset "..." has failed. Manually select an image processing protocol for the related views or patient types.	An image processing protocol could not be converted.	Select a different image processing protocol for the related views or patient types.
Currently only restricted power fluoroscopy available!	The X-ray tube is very hot and only continuos fluoroscopy with reduced power can be selected and operated.	Wait for X-ray tube to cool down before selecting other fluoroscopy modes.
Database problem. The patient "...", "..." ["..."] could not be deleted. The system must be restarted!	The database connection was lost due to an internal error.	Restart of the system is necessary in order to avoid loss of data.
Data from the RIS could not be imported.	Data sent by the RIS server may be corrupted or do not comply with the DICOM standard.	Try to correct the data at the RIS. If the problem persists, call service.

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Message	Possible causes	What can be done
Delete the transferred images in DI memory?	The system is configured such that images in image memory can automatically be deleted only after operator's confirmation.	Confirm, if image deletion is wanted.
Deleting obsolete RIS examinations: "..."	The system is busy deleting old (no longer valid) requests from the database.	Wait a few seconds until the process is finished.
Detector armswing position must be locked in 0° position	Wall stand tilting is inhibited while the detector arm swing is not locked into 0°.	Lock the arm swing in 0° position before tilting.
Detector armswing position must be locked in 90° position	Wall stand automatic movement into a lateral cross-table position is inhibited while the detector arm swing is not locked into 90°.	Lock the arm swing in 90° position before moving into the cross-table position.
Detector calibration is running - please wait until a result is reported.	The message is shown while the calibration process is not yet finished.	Just wait.
Detector Error	An error has occurred in the digital flat detector.	Reboot system. If unsuccessful, call service!
Detector is not ready for acquisition.	You cannot acquire any image because there is a problem with the flat X-ray detector connection.	Reboot the system. If unsuccessful, call service!
Detector self-calibration. Wait "..." seconds ...	You cannot release exposure because the detector is busy calibrating.	Please wait a few seconds as indicated.
Disconnection of the detector was successful.	Appears after the wireless portable detector was disconnected successfully.	-
Disconnect the detector "..." via the infrared adapter.	You are trying to disconnect a wirelss portable detector that is not connected.	Disconnect the correct wireless portable detector, consider the respective label. Or switch to the workspot DETECTOR for digital workflow.
DO NOT SWITCH OFF! Detector IP address configuration running ...	The system is reconfiguring the detector IP address.	Wait until the message disappears. Do not switch off the system before.
Do you really want to delete the selected layout?	The selected print layout is about to be deleted.	Confirm with YES, abort with NO.
Do you really want to delete the selected user account?	A user account has been selected to be deleted.	Confirm the message if you really want to delete the selected user account. Otherwise click NO.
Do you really want to store this image in the service area?	You are about to store an image in the service partition (service drive) on the hard disk.	Press YES to confirm, NO to cancel.
Do you want to delete this image processing protocol(s)?	You are about to delete image processing protocols.	Press YES to confirm, NO to cancel.

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Message	Possible causes	What can be done
Do you want to delete this patient? "...", "..." ["..."]	Warning message that the user is about to delete a patient.	-
Do you want to map RIS code: "..." permanently to examination type: "..."?	You have changed the examination type for an examination, and the RIS code is not yet mapped onto an examination type.	Select YES, if you want to permanently map that RIS code onto this examination type.
Do you want to proceed with the stitching of the images ?	The stitching dialog has been closed using OK or has been quit with auto-confirmation.	-
Do you want to remove "..." from the physician list?	You are about to delete the selected name from the performing physician list.	Press YES to confirm.
Do you want to store the image using the extended image format including the raw image?	You are about to store an image in the customer service area on the hard disk.	You may select extended image format (YES) or standard image format (NO).
Do you want to write these images onto CD/DVD?	You are about to export the images of the selected examination onto a DICOM CD/ DVD.	Press YES to confirm, NO to cancel.
Drive error: Ceiling suspension	A ceiling suspension drive has a technical problem.	Try a system restart. If the problem persists, call service!
Drive error: Table	A table drive has a technical problem.	Try a system restart. If the problem persists, call service!
Drive error: Wall stand	A wall stand drive has a technical problem.	Try a system restart. If the problem persists, call service!
DRR image processing parameter "..." out of range. "..." used instead. Correct protocol or use another one.	A DRR image processing protocol is invalid. One parameter is out of the allowed range.	Correct the invalid parameter of the current protocol or select another protocol. You should save your changed protocol or change the reference of the protocol in the EVA tool.
Due to an increased difference of the detector temperature between calibration "..." and current state "...", technical artefacts may occur. To avoid possible artefacts, please wait until the detector temperature is in range or perform a new calibration with the current detector temperature.	The detector temperature is outside the recommended calibration temperature range.	Go to System – Portable detector. In the table, compare the calibration temperature range with the current temperature. It is recommended to wait until the detector temperature is in range.
Entered report date is incomplete. Please enter a valid date.	The daily report date has not been entered completely.	Select day and year.
Entered report date is in the future. Please enter a valid date.	The daily report date is in the future.	Enter a date in the past.

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Message	Possible causes	What can be done
ERROR: Automatic tube/receptor alignment not possible	The image receptor cannot be aligned to the X-ray source because of a technical error: the corresponding detector or collimator position information is not available.	Align manually. Call service.
ERROR: Bucky tray reference run not successful. Must be repeated.	The Bucky tray reference run could not be successfully completed.	Remove any obstacles. Press any key on the X-ray source control handle to start another reference run (max. no. of retries: 2).
ERROR: Grid is not armed. Pull out tray and push back.	The grid is not armed and cannot move, consequently an exposure cannot be started.	In order to arm the grid, completely pull-out the cassette tray and push it back in.
ERROR: Grid is not moving. Remove and re-insert grid.	The grid could not move, consequently an exposure could not be started.	Remove and re-insert the grid. If the problem persists, call service.
ERROR - Could not schedule "..." examination(s) from RIS	The indicated number of examinations from the RIS could not be added to the worklist, probably because of data errors.	Check the missing worklist items in the RIS for errors. Call Service, if this happens more often.
ERROR - detector is not exposed completely. Please check that the X-ray field covers the whole detector area and repeat the first image.	The first calibration image cannot be used. The X-ray field does not cover the whole detector area.	Adjust and align the X-ray field to cover the complete detector area.
ERROR - detector signal is higher than expected. Please check settings: - Filter wrong or missing? - X-ray settings? - SID too low? Repeat procedure, starting with the first image.	During a calibration or test, the detector signal is higher than expected.	Check settings and repeat the procedure.
ERROR - Detector signal is lower than expected. Please check settings: - Filter, wrong? - X-ray settings? - SID too high? - Grid removed? - Objects in the X-ray field? - X-ray field covers detector completely? Repeat procedure, starting with the first image. If unsuccessful, also check tube efficiency.	During a calibration or test, the detector signal is lower than expected.	Check settings and repeat the procedure.
ERROR - exposure /exposure run aborted	The exposure or exposure run was aborted by an error.	Call service, if this happens more often.
ERROR - fluoroscopy run aborted!	The fluoroscopy run was aborted by an error.	Call service, if this happens more often.

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Message	Possible causes	What can be done
ERROR - Gain calibration failed. Data will not be stored. Please check settings: - Preparation (no filter, insert filter, full field size, no grid, X-ray settings) - No objects in the X-ray field - Alignment between X-ray field and detector. Repeat procedure, starting with the first item.	The gain calibration did not give valid results. Calibration data have not been stored.	Check settings and repeat the calibration.
ERROR - Import of patients from RIS failed	A patient import from the RIS failed and was aborted by a timeout.	Close RIS-search dialog and check if the patient is imported in the patient list.
ERROR - No data available for printing report!	A report cannot be printed because for the requested date there is no available data.	-
Error of filter selection	-	-
ERROR - Offset calibration failed. Data will not be stored. Please check settings, then repeat procedure, starting with the first item.	The offset calibration did not give valid results. Calibration data have not been stored.	Check settings and repeat the calibration.
ERROR - Pixel calibration failed. Data will not be stored. Please check settings: - Preparation (no filter, insert filter, full field size, no grid, X-ray settings) - No objects in the X-ray field - Alignment between X-ray field and detector. Repeat procedure, starting with the first item. If unsuccessful, do a gain calibration first.	The pixel calibration did not give valid results. Calibration data have not been stored.	Check settings and repeat the calibration. Perform a gain calibration first, if needed.
ERROR - Report printout failed	A report could not be printed because of an error.	Call service.
ERROR - The acquisition parameter display values are not up to date or there is no display of values possible at this console!	The main console display is not operable or does not display actual values.	Call service immediately!
ERROR - The Area Scan movement has been aborted.	A collision or a hardware failure of detector or X-ray tube assembly occurred.	Move the column manually and check whether the movement can be performed without any problems. If the problem persists, call service.

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Message	Possible causes	What can be done
ERROR - The patient database is completely full. You must manually delete examinations before proceeding!	In spite of automatic deletion of completed entries, there is no space left in the patient database.	Delete examinations that are no longer needed. Call service, if this happens frequently without obvious reason. Make it a rule to close examinations directly after finishing.
ERROR - The system could not map the requested examination (RIS code) onto an application. A default application has been assigned.	For the selected examination, the RIS code could not be mapped onto a selectable application. Therefore a default application was selected.	Manually select an appropriate application type. Have the RIS code mapping updated accordingly.
ERROR - the system is unable to reach the MPPS server. No MPPS messages can be sent.	The system could not send an MPPS message to the corresponding station, probably because there is no connection.	Restart the MPPS server and/or check the network connection. If problem remains, call service.
ERROR - The test patient could not be created successfully. "..."	The exam type "service/test images" (test patient) could not be loaded, for example, because test images are missing.	Try again. Call service.
ERROR - writing to CD/DVD not successful. Failed patients: "...". Do you want to retry on another blank?	Physical errors during writing the CD/DVD.	Insert a new CD/DVD. Answer yes: If you want to retry an identical CD/DVD compilation. Answer no: If you want to discard the compilation.
Examination already started, no update possible	The RIS has sent updated information for a previously booked examination. These modifications are disregarded, because the examination is already in progress, completed, or suspended.	Make your changes in the RIS prior to starting the examination. Call service, if this message occurs frequently.
Exit QA (quality assurance) mode? The images created in this mode will be lost if they have not been printed or exported!	You are about to change from QA mode back to diagnostic.	Press YES to exit the QA mode (complete change to DIAGNOSTIC) or press NO and remain in QA mode.
Export job failed: "..."	Software/Configuration problem.	Call service.
Exposure: Please try again!	The unit is now ready for radiography.	Let go of the radiography switch and press it again to start exposures.
EXPOSURE FAILURE! Check exposure settings and AEC chamber position.	The automatic exposure control was not able to finish the last exposure properly. There may be an object in the radiation field which is considerably attenuating radiation (or no object at all), the exposure values selected may be significantly too low or too high, or the exposure button was not pressed long enough.	Check object and settings. Confirm the corresponding message on the main examination console.

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Message	Possible causes	What can be done
EXPOSURE FAILURE! Exposure switch was not pressed long enough.	The last exposure was not finished properly. The exposure button was not pressed long enough.	Confirm this message on the main examination console. The exposure button should normally be kept pressed until the sound indicates exposure termination.
EXPOSURE FAILURE! Generator or X-ray tube fault	The last exposure was not finished properly, for example, by cause of a generator or X-ray tube fault.	Confirm the message on the main examination console. Call service.
Exposure frame rate dynamically reduced	The frame rate was reduced because the exposure time is longer than compatible with this frame rate.	Try different exposure technique factors.
Failed to arrange the images automatically. Please arrange them manually.	The automatic stitching algorithm failed.	Arrange the images manually in the editor. If the problem persists frequently call service.
Failed to create print job for auto print.	-	Try manual printing.
Failed to load image configuration data from file. Please Call Service.	The IP-static component could not load its configuration data file. This contains only data which can be set by the user in the system area of the application. It can be caused by a failed backup/restore process.	Try to restore a valid backup file again. If not successful it is possible to restore the settings by hand in application's System-Area.
Failed to stitch the images automatically. Please open the stitching editor and stitch them manually.	The automatic stitching algorithm failed.	Open the stitching editor and perform the stitching manually. If the problem persists frequently call service.
Failed to stitch the images manually. You can change the image arrangement in the stitching editor and try again.	No stitched image can be computed from the manual arrangement of the images in the stitching editor.	Retry the manual arrangement of the images in the stitching editor. If the problem persists, frequently call service.
Field size limitation error	The switch to field size limitation mode has failed due to a software error.	Switch between the registration devices “Fluoro and spot images” and “Free cassette”. If this does not work, restart the system. If the problem still remains, call service.
Filter error. Select a different patient type and then return to the initial patient type. If the error remains, call service.	Because of an error during filter selection, you cannot release exposures.	Call service. Fluoroscopy might still be operational (with limitations).
Fluoroscopy: Please try again!	The unit is now ready for fluoroscopy.	Let go of the fluoroscopy switch and press it again to start fluoroscopy.
Fluoroscopy is not possible with selected device!	A fluoroscopy switch was pressed while fluoroscopy is not possible with the currently selected auxiliary.	Select an auxiliary which supports fluoroscopy.

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Message	Possible causes	What can be done
Following licence file was found: "..."("...") Licence-dependent changes become active after restart of the computer. Import licence and restart system now?	Import procedure found a valid license file.	Select YES, for importing the valid license file and exit the application. Select NO, otherwise.
For the current image there is no valid pixel size information present. Some functions of this tool will give no or meaningless results.	There is no pixel size information for the current image. Therefore any size information will be incorrect and distance measurements will give no meaningful results. Zoom mode "Life-size" (100%)does not display the correct actual size.	The system assumes a default pixel size which is probably incorrect. Do not base any clinical judgement on size information provided by this tool.
Gain calibration successfully finished.	The gain calibration has been be performed with valid results and calibration data have been stored.	-
Generator is not ready.	The generator may not be switched on.	Restart the generator. If the problem persits, call service!
Geometry error. Refer to the error description on the control console.	There is an error in the geometry. The system may not be ready for exposure. The position of the shutter, filter, or grid may be incorrect.	Refer to the error description on the control console. In case of any emergency reasons fluoroscopy is operational. Restart the system. If the problem persists, call customer service.
Geometry error. Refer to the error description on the control console.	Movement is not possible due to a geometry error. The position of the shutter, filter, or grid may be incorrect.	Refer to the error description on the control console. In case of any emergency reasons fluoroscopy is operational. Restart the system. If the problem persists, call customer service.
Geometry error. Refer to the error description on the control console. For emergency reasons fluoroscopy is still operational. Correct shutter, filter, and grid position cannot be guaranteed.	Movement could not be performed due to a geometry error.	Refer to the error description on the control console. Restart the system. If the problem remains, call service.
Geometry movement is not possible because the stretch grip is mounted to the wall stand.	The stretch grip is plugged into the wall stand and a geometry movement is requested.	Remove the stretch grip from the wall stand.
Geometry position cannot be stored because the X-ray tube assembly has not been locked into place after rotation.	The X-ray tube assembly is not locked into place.	Make sure that the X-ray tube assembly is locked into place.
Geometry position cannot be stored because this description already exists. Use another description.	This description has already been used with another geometry position.	Use another description and store the geometry position again.

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Message	Possible causes	What can be done
Geometry position has been reached.	A geometry position movement has reached the selected position.	-
Geometry position is not adjusted.	The geometry position assigned to this view and auxiliary combination has not been adjusted yet.	Contact the advanced user.
Grid is missing!	The exposure program is set for using a grid, but no grid is mounted on the portable detector.	Mount a grid or adapt the technique factors accordingly.
High dose is selected	Fluoro flavour with high dose has been selected by the user. This might allow a higher patient entrance dose rate than usual. This might be needed to penetrate a heavy patient.	Switch back to Normal if not needed anymore.
Image processing protocol "..." not found. Please select another protocol.	An image processing protocol programmed for this view does not exist. "None Processing" is applied.	Select another image processing protocol. To fix this problem permanently, you should either create a new protocol with the missing name or correct the wrong reference of the protocol in the EVA tool.
Images are being processed. This may take up to 3 minutes.	The image processing takes longer than usual.	Wait until the processed image is displayed.
Image transfer failed - check connection!	A connected workstation or the integrated Viewforum workstation program is not responding.	Check workstation for correct operation and connection.
Insert the selected image from "..." at "..."?	When moving an image, the selected image is about to be inserted into another patient folder.	Press YES to proceed, otherwise press NO.
Insufficient query input, at least one of the following attributes is needed: - Patient ID - First name - Last name	For a PACS query, at least one patient identifying attribute must be entered.	Enter at least one of the following: patient ID, first name, last name. You may enter wildcards (*,?) as part of an attribute.
Internal error - call service.	Possibly an error occurred because of wrong system configuration or a hardware defect.	Restart the system. If the problem persists, call customer service.
Internal print error.	Software/Configuration problem.	Internal error. Call service.
Internal print initialization error.	Software/Configuration problem.	Internal error. Call service.

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Message	Possible causes	What can be done
Invalid date/time settings! Please enter new date and time.	The system has encountered invalid date/ time settings upon startup. There may be a problem with the permanent storage of system data.	Enter correct date and time. Call service.
Invalid entries found in export destination settings. Invalid entries have been removed. Check export destinations!	The field service DICOM export configuration has been changed. The result is not compatible with the export destination settings under “System/Settings/Export destinations”. Conflicts have been removed automatically.	Reconnect the used export scheme in “System/Settings/Export destinations” to a valid DICOM export target.
Invalid entries found in print destination settings. Invalid entries have been removed. Check print destinations!	The field service printer configuration has been changed. The result is not compatible with the print destination settings. Conflicts are removed automatically.	Reconnect the used print medium types in “System/Settings/Print destinations” to valid printer and film formats.
It is not possible to attach this detector type to the system.	You have tried to attach a detector type which is not supported.	Attach a detector type which is supported for this system.
Key has currently no function.	No function is currently assigned to the button you have pressed.	-
Last login attempts Successful attempt: “...” Failed attempt: “...” Number of failed attempts: “...”	Due to the set password rules the date and time of the last successful and failed login attempts are displayed.	Contact your local system administrator.
Layout is in use and cannot be deleted.	A print layout which is in use cannot be deleted.	Confirm message with OK.
Layout saved successfully.	The layout has been stored.	-
Limit of supported user accounts is exceeded. Delete all obsolete user accounts.	The number of supported user accounts is exceeded.	Ask the system administrator to delete all obsolete user accounts.
Lock-in only possible during fluoroscopy	The Lock-in function can only be called up during fluoroscopy.	-
Log-in not allowed - new software was installed on this system and the instructions for setting to work need to be executed first. Only advanced users may log in now!	New software was installed and the instructions for setting to work still need to be done.	An advanced user has to log in and execute the 'first use instructions' that come with the software package.
Low disk space for images. Please complete some examinations in order to free disk space.	The tidy up could not delete images because examinations are protected against automatic deletion unless they are completed.	Complete all examinations that are currently in progress but are not needed any longer.
Low PC battery - Charge soon.	The PC’s battery charge level is less than 50%.	Connect the unit to the main power supply soon.

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Message	Possible causes	What can be done
Manual overrides are stored ...	System is storing exposure program modifications.	-
Max. preparation time for exposure exceeded: Please try again.	The preparation button was pressed for a longer time without an actual exposure request. Preparation was aborted.	Let go of the radiography switch and press it again to start exposures.
Maximum fluoroscopy time limit reached: press button	Fluoroscopy is disabled since the maximum cumulative fluoroscopy time limit is reached.	Press the button for resetting the max. fluoroscopy time alarm buzzer.
Maximum scale value is 500 %	Within the printing tool, the maximum scaling factor is 500% and cannot be exceeded.	-
Maximum uninterrupted fluoroscopy time - fluo stopped.	Fluoroscopy is stopped since the maximum uninterrupted fluoroscopy time is exceeded.	Let go of the fluoroscopy switch and press it again to restart fluoroscopy.
Message from Service: "..." Press NO if you want to be reminded again.	This is a message from the Service about changes to your system settings, possibly accompanied by a short instruction what you should do.	Confirm the message with YES to accept. Pressing NO will diplay this message again after 1 hour.
Movement aborted: Beam center outside usable range	An automatic detector beam alignment movement was aborted because the target position is outside the useful table length range.	Adjust the beam center position and try again.
Movement aborted: tabletop or patient area blocks movement path	An automatic detector movement was aborted because of a danger of collision with the tabletop or with a patient who might be lying on the table.	Move the detector or the table using the normal movement functions.
New software was installed remotely. This message will be shown on every startup until an advanced user logs in.	-	-
No alignment - detector is tilted	The image receptor cannot be aligned to the X-ray source because the wall stand is not in the exact horizontal or vertical position.	Tilt wall stand into horizontal or vertical position.
No alignment - detector swing is not locked	The image receptor cannot be aligned to the X-ray source because the wall stand swing movement is not locked in center position.	Lock detector in center swing position.
No alignment - target position out of movement range	The image receptor cannot be aligned to the X-ray source because the target position is out of the movement range.	Correct X-ray source position or tilt angle.

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Message	Possible causes	What can be done
No alignment - tube is tilted too far	The image receptor cannot be aligned to the X-ray source because the beam angle is more than 45° from perpendicular.	Reduce X-ray source assembly tilt angle relative to the image receptor.
No geometry position has been assigned.	No geometry position has been assigned for this view and auxiliary combination in the EVA tool.	Contact the advanced user.
No grid in use! Check whether SkyFlow is applied.	The SkyFlow license is present within the system. The exposure program is set for using a grid, but no grid is mounted on the portable detector.	Mount a grid or make sure that SkyFlow is switched on.
No grid in use. SkyFlow enabled.	Grid usage is pre-configured but no grid is in use.	Use grid or proceed using SkyFlow.
No layout selected	The current action requires a layout to be selected.	Select a layout first.
No movement - EMERGENCY STOP switch is pressed	The movement stop switch has been pressed. No motorised movements are possible anymore.	Pull the STOP switch to enable the movements again.
No RIS connection!	A RIS query cannot be executed because there is no RIS connection available at the moment.	Retry later. If the problem remains, check RIS and/or network connection. If it still remains, call service.
No RIS connection available! Please confirm.	The system is configured for patient data input via RIS connection but there is no RIS connection available.	Call service.
No RIS patients visible, schedule manually.	The emergency user is not allowed to schedule patients from a RIS.	Schedule manually, or log in as a normal user.
No stitching run possible - collimator key switch is activated	You cannot release a stitching run or test run, because the collimator key switch is set to emergency operation, for example, automatic collimator functionality is disabled.	Set the collimator key switch to normal.
No table movement – 2nd tube is not in safe zone	The user requests a specific table movement. The specific table movement is currently disabled because the ceiling suspension is near to the table zone.	Move the ceiling suspension into the safe zone.
NOT READY - A cassette is still inside the wall stand but this is not the active auxiliary	You cannot release exposures on table Bucky or free cassette auxiliaries because there (still) is a cassette inside the wall Bucky stand. The wrong device might be selected.	Remove cassette from wall Bucky stand or select the correct auxiliary.

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Message	Possible causes	What can be done
NOT READY - AMPLIMAT chambers are not hit by the radiation field	You cannot release AEC exposures because the X-ray field does not cover any AMPLIMAT field.	Change field size and/or alignment or use manual exposure techniques.
NOT READY - A patient must be selected for digital exposures	You work in the “no patient selected” mode which is reserved for conventional radiography only, and requested an exposure on a digital receptor.	Change the auxiliary to conventional radiography or select the patient from the worklist
NOT READY - Bucky tray still open	You cannot release exposure because the Bucky tray is not completely closed for the selected device.	Close the Bucky tray.
NOT READY - Bucky wall stand error	You cannot release exposure because there is an error inside the wall Bucky stand subsystem.	Call service.
NOT READY - Calculated expo frame rate is out of range	The calculated exposure frame rate cannot be set since it is out of range.	Try a different exposure program. Call service.
NOT READY - Cannot release X-ray for this device from that switch	You cannot release exposure or fluoroscopy for the ceiling suspended X-ray source from the spot image device controls.	CS source X-ray operation can only be released from the control room area.
NOT READY - Cannot release X-ray for this device here	You cannot release exposure or fluoroscopy for the main X-ray source from the CS source controls.	Main source X-ray operation can only be released from the spot image device and corresponding foot switches.
NOT READY - CASSETTE is selected. Disconnect the detector via the infrared adapter first.	At the Eleva Workspot CASSETTE is selected. You are trying to release an exposure while the wireless portable detector is connected.	Disconnect the wireless portable detector by holding the infrared sensor of the detector in front of the infrared adapter. Check the label.
NOT READY - Cassette missing or tray open	You cannot release an exposure because no cassette has been inserted into the selected device, or the Bucky tray has not been closed. Also, the wrong device might have been selected.	Insert the cassette into the selected device. Make sure that the Bucky tray is closed.
NOT READY - Ceiling suspended X-ray tube is not in the safe zone.	You are about to start an Area Scan and the ceiling suspended X-ray tube is not in the safe zone.	Start the Area Scan only when the ceiling suspended X-ray tube is in the safe zone.
NOT READY - Ceiling suspension motor drive error	Because of an error in the ceiling suspension drives you cannot release tomography exposure, a stitching run, or a corresponding test run.	Call service.
NOT READY - Check beam alignment first	You cannot release exposure, because the user guidance to check for correct beam alignment has not be confirmed yet.	Check beam alignment and confirm the corresponding user guidance by pressing OK.

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Message	Possible causes	What can be done
NOT READY - Cloning of the examination is still in progress	Exposure cannot be started while the examination is cloned.	Please wait until cloning is finished.
NOT READY – Collimator not adjusted to 0°	You cannot run fluoroscopy since the collimator is not adjusted to 0° position.	Adjust the collimator into the 0° position and try again.
NOT READY – Collimator shutter error	The shutter could not be moved due to an error while you are trying to release exposure.	Try selecting a different registration device and returning to the initial registration device. Alternatively try restarting the system. If the error remains, call service. Fluoroscopy might still be operational.
NOT READY - Compression cone is not parked.	You are about to start an Area Scan and the compression cone is not parked.	Start the Area Scan only when the compression cone is parked.
NOT READY - CS beam does not hit the image receptor	You cannot release exposures because the X-ray central beam does not hit the image receptor at all.	Move X-ray source and/or receptor in longitudinal direction until the beam can hit the image receptor.
NOT READY - CS not centered in lateral direction (marked blue)	You cannot release exposures because the X-ray source is not correctly centered laterally (transverse) on the image receptor.	Move X-ray source and/or receptor laterally into the correct stop.
NOT READY - CS not centered in lateral direction (marked blue), grid in place	You cannot release exposures because the X-ray source is not correctly centered laterally (transverse) on the image receptor and a grid is inserted. Grid exposures should only be executed with the X-ray source centered on to the grid lines.	Move X-ray source and/or receptor laterally into the correct stop or remove the grid.
NOT READY - CS not centered in longitudinal direction (marked green)	You cannot release exposures because the X-ray source is not correctly centered longitudinally on the image receptor.	Move X-ray source and/or receptor longitudinally into the correct stop.
NOT READY - CS not centered in longitudinal direction (marked green), grid in place	You cannot release exposures because the X-ray source is not correctly centered longitudinally on the image receptor and a grid is inserted. Grid exposures should only be executed with the X-ray source centered on to the grid lines.	Move X-ray source and/or receptor longitudinally into the correct stop or remove the grid.
NOT READY - CS not locked in lateral direction (marked blue)	You cannot release a stitching run or test run because the X-ray source is not locked in lateral direction (SID).	Move X-ray source lateral into a detent.
NOT READY - CS not locked in longitudinal direction (marked green)	You cannot release a stitching run or test run because the X-ray source is not locked in longitudinal direction (SID).	Move X-ray source longitudinal into a detent.

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Message	Possible causes	What can be done
NOT READY - CS source arm swing movement not locked	You cannot release exposures, a stitching run, or a corresponding test run, because the X-ray source assembly swing movement is not locked.	Move into (correct) lock position.
NOT READY - CS source collimator error	Because of an error in the ceiling suspended X-ray source collimator you cannot release any exposures.	Call service. If your system is equipped with a key switch at the collimator, you might enable emergency operation by operating that key switch.
NOT READY - CS source radiation filter error	Because of an error in the ceiling suspended X-ray source collimator filter changer you cannot release any exposures.	Call service. If your system is equipped with a key switch at the collimator, you might enable emergency operation by operating that key switch.
NOT READY - CS source swing movement not in lock position, grid in place	You cannot release exposure, because the X-ray source assembly swing movement is not locked and a grid is inserted. Grid exposures should only be executed with the X-ray source centered on to the grid lines.	Move X-ray source arm into lock position or remove the grid.
NOT READY - Database busy preparing data	You cannot release exposure or fluoroscopy while the system is busy distributing or collecting corresponding data.	If the problem persists, call service.
NOT READY - Detector arm swing not locked, grid in place	You cannot release exposures because the image receptor arm swing movement is not locked in center position and a grid is inserted. Grid exposures should only be executed with the X-ray source centered on to the grid lines.	Lock detector in center arm swing position or remove the grid.
NOT READY - Detector error	You cannot release exposure because there is a problem with the flat X-ray detector .	Reboot system. If unsuccessful, call service!
NOT READY - Detector is busy calibrating	You cannot release exposure because the detector is busy calibrating.	Please wait for a short moment and try again.
NOT READY - Detector is calibrating	You cannot release exposure because the flat X-ray detector is currently busy calibrating.	Wait for a few seconds and try again.
NOT READY - Detector missing or tray open	You cannot release an exposure because the detector has not been inserted into the selected device, or the Bucky tray has not been closed. Also, the wrong device might have been selected.	Insert the detector into the selected device. Make sure that the Bucky tray is closed.

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Message	Possible causes	What can be done
NOT READY – Detector off - temperature too high	The operator requests exposure but the detector has been shut off due to high temperature.	For emergency use try to continue working after the detector has restarted automatically after 10 minutes cool-down time. Call service.
NOT READY - Detector swing not locked, grid in place	You cannot release exposures because the image receptor swing movement is not locked in center position and a grid is inserted. Grid exposures should only be executed with the X-ray source centered on to the grid lines.	Lock detector in center swing position or remove the grid.
NOT READY - Door is not closed	A radiation protection door is open (depending on installation), so radiography and fluoroscopy are not possible.	Close the radiation protection door.
NOT READY – Error of filter selection	Because of an error during filter selection, you cannot release exposures.	Call service. Fluoroscopy might still be operating (with limitations).
NOT READY - Exposure hand switch error	Because of an error in the exposure hand switch you cannot release exposure.	Call service. Fluoroscopy might still be operating (with limitations).
NOT READY - External safety device is enabled.	You are about to start an Area Scan and the external safety device is enabled.	Make sure that the upper room limit is not exceeded.
NOT READY – Field size limitation error	The switch to field size limitation mode has failed due to a software error.	Switch between the registration devices “Fluoro and spot images” and “Free cassette”. If this does not work, restart the system. If the problem still remains, call service.
NOT READY – Fluoroscopy not allowed, only spot exposures allowed.	Operator is trying to release fluoroscopy while performing a dynamic detector calibration.	Release all exposures for dynamic detector calibration using the exposure pedal.
NOT READY - Focal spot distance too small	The SID is set so small that the focal spot to skin distance is definitively too small.	Increase SID.
NOT READY - Foot switch error	Because of an error in the foot switch you cannot release exposure.	Call service. Fluoroscopy might still be operating (with limitations).
NOT READY - Generator is too hot	You cannot release exposures because the generator is too hot.	Wait for the generator to cool down.
NOT READY - Geometry error	Because of an error in the geometry you cannot release exposures.	Call service. Fluoroscopy might still be operating (with limitations).
NOT READY - Geometry position movement is active.	The user requests X-ray while a geometry position movement is active.	Release X-ray again, when the appropriate geometry position has been reached.

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Message	Possible causes	What can be done
NOT READY - Grid not correctly inserted	You cannot release exposure because the grid is not completely inserted or is jammed.	Remove and re-insert the grid.
NOT READY – Grid position unknown	You cannot release exposures on the table because the grid is moving into position.	Wait until the target grid position is reached.
NOT READY - Image receptor not horizontal, wrong auxiliary selected?	You cannot release exposures because the image receptor is in a vertical position while the table auxiliary is selected. The wrong device might be selected.	Tilt the image receptor into a horizontal position or select the correct auxiliary.
NOT READY - Image receptor not vertical, wrong auxiliary selected?	You cannot release exposures because the image receptor is in a horizontal position while the wall Bucky auxiliary is selected. The wrong device might be selected.	Tilt the image receptor into a vertical position or select the correct auxiliary.
NOT READY - Last image not completely retrieved from portable detector.	You cannot release exposure because the last image could not be retrieved from the wireless portable detector and still resides in there. This may be the result of a WiFi connection problem or low battery.	Connect the backup cable.
NOT READY - Last image was not exposed correctly	Although the last image was not correctly exposed, you have not confirmed the corresponding message.	Confirm the corresponding message on the main examination console.
NOT READY - Last image was overexposed	Although the last image was not correctly exposed, you have not confirmed the corresponding message.	Confirm the corresponding message on the main examination console.
NOT READY - Light barrier is enabled.	You are about to start an Area Scan and the light barrier is enabled.	Make sure that the light beam is not interrupted.
NOT READY - Move CS down	The tube position is too high for stitching on the wall stand.	Move the ceiling suspension down.
NOT READY - Move CS towards table center	The tube position is too far off the table center for stitching on the table.	Move the ceiling suspension towards the table center.
NOT READY - Move CS up	The tube position is too low for stitching on the wall stand.	Move the ceiling suspension up.
NOT READY - Move wall stand detector below table	You cannot release a stitching run or test run, because the vertical stand detector is not positioned below the TH-S table.	Position the detector below the table.
NOT READY - Must first switch to “examination” task	The exposure switch is pressed while not in the examination task.	Enter the examination task first.

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Message	Possible causes	What can be done
NOT READY - No connection to wireless portable detector. Check WiFi connection / backup cable or attach detector again.	You cannot release exposure because there is no connection to the wireless portable detector.	Check, if the wireless connection has been interrupted. If necessary use the backup cable or retry to attach the detector.
NOT READY - No detector calibration data found	You cannot release exposure because the portable detector has not been calibrated on this system.	Perform a detector calibration within QA mode.
NOT READY - No detector connected.	You cannot release an exposure because the detector is not connected.	Check the cable connection.
NOT READY - No examination selected	You cannot release exposures or fluoroscopy since there is no examination selected.	Try to select a new examination. If the problem persists, call service!
NOT READY - No further exposures possible after cloning the examination	The examination has been cloned, therefore no further exposures can be made into the original examination.	Proceed using the examination clone.
NOT READY - No portable detector connected	You cannot release exposure on a the portable detector because it could not be successfully connected to the system.	Try to connect another detector, if available. If unsuccessful, call service.
NOT READY - No view selected	-	-
NOT READY - Patient database is full	You cannot release exposure because the patient database is completely filled.	Delete examinations that are no longer needed. Call service, if this happens without obvious reason. Make it a rule to close examinations directly after finishing.
NOT READY - Point source assembly to receptor!	You cannot release exposures because the 2nd beam direction does not match the selected receptor.	Point X-ray source assembly towards selected receptor.
NOT READY - Processing images	You cannot release exposures because the system is busy processing incoming exposures.	Please wait a moment.
NOT READY - QA mode not selected	For service user only: the adjustment procedure needs to be executed in QA mode.	Switch to QA mode first.
NOT READY - Reduce collimation field size.	Automatic collimation limitation has failed.	Reduce the collimation field size.
NOT READY - Reduced power supply to the generator. Call service!	The mains power supply may be insufficient, the generator adjustment may be incorrect, or the generator may be defective.	No exposure possible, call service.
NOT READY - Selected auxiliary at generator console is unknown.	The Eleva Workspot can not communicate with the generator console.	Select another auxiliary at the generator console and then select the desired auxiliary again. Wait a moment until the green ready indicator lights up.

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Message	Possible causes	What can be done
NOT READY - Selected detector not configured or not connected	You cannot release exposures, since the selected detector is not available.	Select a different image receptor. Call service, if this message appears unexpectedly.
NOT READY - Selected mAs value too high	You cannot release exposure because the selected mAs is out of range.	As appropriate, decrease mAs value or change kV or select large focal spot.
NOT READY - Selected ms value is too high	You cannot release exposures because the selected ms value is out of range.	Decrease ms value, change kV value or select large focal spot accordingly.
NOT READY – Setting shutter limits is still in progress	A request to limit the shutters to the detector borders is still in progress.	Wait until shutter limits have been set.
NOT READY – Shutter still moving	The shutter is still moving while you are trying to release exposure.	Wait for the shutter to stop moving.
NOT READY - SID sensing error	Because of an error in the X-ray source to table distance sensing circuit you cannot release any exposures.	Call service. If your system is equipped with a key switch at the collimator, you might enable emergency operation by operating that key switch.
NOT READY - SID unknown	You cannot release exposures because the SID is unknown and there is no automatic limitation of field size to receptor size.	Move ceiling suspension into the correct lock. If problem persists, call service. If your system is equipped with a key switch at the collimator, you might enable emergency operation by operating that key switch.
NOT READY - SID unknown. Try changing the SID.	You cannot release exposures with the table tube because the SID is unknown and there is no automatic limitation of field size to receptor size.	Change the SID at the table tube assembly. If the error remains, call service.
NOT READY - Stitching run is not possible because the stretch grip is mounted to the wall stand.	The stretch grip is plugged into the wall stand and a stitching run is requested.	Remove the stretch grip from the wall stand.
NOT READY - Stitching with connected detector is not supported.	The user requests X-ray for a stitching examination but stitching with the connected detector is not supported.	Select a detector which does support the stitching function.
NOT READY - Synchronization timeout error	X-ray generation could not be started because the synchronisation signal was missing. Either the grid could not move or the digital flat detector subsystem is not ready for image acquisition.	Check if the grid is inserted correctly and if the digital flat detector subsystem shows a green ready indication light.
NOT READY - Synchronization timeout error - Check if the grid is inserted correctly. - Open the cassette tray of the Bucky unit more than ¾ to tense the grid. - Check if the Eleva Workspot shows a green ready indication.	Taking exposures is not possible. Either the grid can not move or the detector is not ready for image acquisition.	Check if the grid is inserted correctly and if the detector is connected and ready for exposure.

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Message	Possible causes	What can be done
NOT READY - System controller problem or error	Because of an error in the system you cannot release exposures or fluoroscopy.	If there is no obvious reason for this message, for example, a power failure, call service immediately.
NOT READY - SYSTEM ERROR, CALL SERVICE! System needs to be rebooted.	-	-
NOT READY - The Area Scan movement parameters are invalid.	Incorrect Area Scan parameter configuration within the EPX database, for example, “Image interval” set to 0.	Check and correct the Area Scan parameter configuration within the EPX database.
NOT READY - The backup cable is plugged into a detector which is not connected to this system	The backup cable is plugged into a portable detector that is currently not connected to this system.	The Detector needs to be connected (registered)to the system, before it can be used for X-ray exposure.
NOT READY - The battery of the portable detector is empty.	The battery of the portable detector is empty.	Exchange the battery of the portable detector.
NOT READY - The cassette has already been exposed	You cannot release exposure because the cassette was not changed after the last exposure.	Change the cassette.
NOT READY - The detector is still inside the wall stand but this is not the active auxiliary	You cannot release exposure on a table Bucky or free cassette auxiliary because there (still) is the portable detector inside the wall Bucky tray. The wrong device might be selected.	Remove detector from wall Bucky tray or select the correct auxiliary.
NOT READY - The geometry is moving.	You have started an Area Scan while the geometry was still moving.	Only start the Area Scan when the geometry is not moving.
NOT READY - The image cannot be processed. Restart the system.	Operator is trying to release an exposure while the last received image is still being processed.	Restarting the system will recover the image and start the processing again. Afterwards system will be ready for exposure.
NOT READY – The portable detector in the wall Bucky unit is not attached.	A different portable detector is currently attached to the system.	Attach the appropriate portable detector to the system.
NOT READY - The selected examination is already completed	You cannot release exposures since the currently selected examination has already been completed.	Select a different examination or schedule a new one.
NOT READY - Tube assembly must be set to 0° (vertical beam)	You cannot start a stitching run or test run on the table because the X-ray tube is not exactly pointing downwards.	Adjust tube to vertical.
NOT READY - Tube assembly must be set to 90° (horizontal beam)	You cannot start a stitching run or test run on the vertical stand because the X-ray tube is not exactly pointing horizontal.	Adjust tube to horizontal.

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Message	Possible causes	What can be done
NOT READY - Tube control handle error	Because of an error in the ceiling suspended X-ray source control handle you cannot release any exposures.	Call service.
NOT READY – Tube not in 0° position	A fluoro or spot exposure is requested while the tube is not tilted to 0°.	Tilt the tube to 0°.
NOT READY - Unknown filter position	Unknown filter position due to a geometry error.	Refer to the error description on the control console. Restart the system. If the problem remains, call service.
NOT READY - Unknown grid position	Unknown grid position due to a geometry error.	Refer to the error description on the control console. Restart the system. If the problem remains, call service.
NOT READY - Unknown shutter position	Unknown shutter position due to a geometry error.	Refer to the error description on the control console. Restart the system. If the problem remains, call service.
NOT READY - Unregistered second portable detector present in system	There is more than one portable detector inserted into a Bucky tray.	Remove the wrong (not registered) detector.
NOT READY - Wall Bucky tray not at fixed position	You cannot release exposures because the wall Bucky tray is tilted into horizontal position but is not in the intended vertical position (lock).	Move wall Bucky tray vertical into locked position.
NOT READY - Wall stand arm swing position must be locked.	-	-
NOT READY - Wall stand detector swing position must be locked in 0° position.	-	-
NOT READY - Wall stand detector tilt position not suitable	You cannot release a stitching run or test run, because the vertical stand is not tilted to exact horizontal or vertical position.	Tilt the vertical stand detector into vertical position (or into horizontal position for use below the table).
NOT READY - Wall stand detector too close below tabletop	You cannot release a stitching run or test run, because the detector has been moved up too close to the table top. The automatic movement needs a certain clearance distance.	Change the table height a little. This will reactivate detector height tracking.
NOT READY - X-ray beam is angulated.	You are about to start an Area Scan and the X-ray beam is angulated.	Start the Area Scan only when the X-ray beam is not angulated.
NOT READY - X-ray generator error	Because of an error in the generator you cannot release any exposures.	Call service. Fluoroscopy might still be operating (with limitations).
NOT READY - X-ray is disabled	You cannot release exposure or fluoroscopy while X-ray is disabled.	X-ray can be re-enabled from the main console auxiliary selection.

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Message	Possible causes	What can be done
NOT READY - X-ray source not exactly rotated into vertical or horizontal position	You cannot release exposures because the X-ray source is tilted into a position close to but not exactly vertical or horizontal.	Tilt the X-ray source exactly into the horizontal or vertical detent.
NOT READY - X-ray source still moving	You cannot release exposures since the ceiling suspended X-ray tube height tracking movement is not yet completed.	Wait until the movement is finished or switch off the CS tracking function at the CS control handle.
NOT READY - X-ray tube filament pre-heating. Please wait ...	You cannot release exposure or fluoroscopy, because the X-ray tube or focal spot selection has been changed, and preheating the filament for the currently selected focal spot is not yet finished.	Wait for a short moment until the green ready indicator lights up, try again.
NOT READY - X-ray tube is too hot	You cannot release exposures because the X-ray tube is too hot.	Wait for X-ray tube to cool down.
NOT READY - X-ray tube not yet operable. Please wait ...	You cannot release exposure or fluoroscopy, because a switching over action inside the system is not yet finished.	Wait for a short moment until the green ready indicator lights up, try again.
NOT READY - X-ray tube rotation drive is too hot	You cannot release exposures because the X-ray tube stator is too hot. Another anode rotation acceleration is not possible now.	Wait for a short moment until the green ready indicator lights up, try again.
No tube tracking - key switch is enabled	Tracking is switched on while the key switch at the collimator is activated.	Tracking cannot be enabled while the key switch is active.
No valid configuration found at "...". Call service.	Import of wrong configuration files.	Call service to configure the available printers or print templates properly.
No valid medium found for printer. Call service.	Printing is not possible because no valid medium size can be found in the printer configuration.	Call service to configure the available printers and print media properly.
No valid printer found in configuration. Call service.	Printing is not possible because no printer found in configuration.	Call service to configure the available printers properly.
Now generating image "..." of "..."	Indicating the progress in a stitching run.	-
No worklist updates available	A worklist update was requested while there is no new information available.	-
Offset calibration may take about 4 minutes. Press OK to start.	The calibration run may be started now. This may take some time while the system cannot be used normally.	Confirm this message to actually start the calibration.
Offset calibration successfully finished.	The offset calibration has been be performed with valid results and calibration data have been stored.	-

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Message	Possible causes	What can be done
One or more patients could not be scheduled. The patient data may be corrupted or do not comply with the DICOM standard. Try to correct the data at the RIS.	Data sent by the RIS server may be corrupted or do not comply with the DICOM standard.	Try to correct the data at the RIS. If the problem persists, call service.
OVEREXPOSURE! Check exposure settings and AEC chamber position.	The automatic exposure control was not able to finish the last exposure properly. There may be no object in the radiation path or the exposure values selected may be significantly too high.	Check object and settings. Confirm the corresponding message on the main examination console.
OVEREXPOSURE - Must correct technique factors!	The automatic exposure control was not able to finish at least one exposure properly. There is possibly no object in the radiation path which is considerably attenuating radiation or the exposure values selected are much too high.	You may have to set lower exposure values.
Password changed successfully.	Password change was successful.	-
Password not accepted! Please enter a password with a minimum length of "..." characters.	The password entered is too short.	Enter a new password of appropriate length.
PatientID must not be empty.	The patient ID was deleted and not replaced by a new one. Your change was not accepted.	Enter a valid patient ID into the corresponding field.
Patient with these identifying attributes is already present in the database. Please select other values.	System is configured to identify patients by a set of identifying attributes. A patient with these identifying attributes is already present in the database.	Only combinations of identifying attributes that are not already present can be used.
PC battery empty – Charge immediately or system will shut down.	The PC's battery charge level is less than 7%.	Connect the unit to the main power supply.
Pixel calibration successfully finished.	The pixel calibration has been be performed with valid results and calibration data have been stored.	-
Please either create the composite image, reject the individual images or move them to a normal view.	A patient or an examination is completed, but no composite image has yet been created from a stitching view.	Finish stitching view or use the Move-Image-Tool to move the images from the stitching view to a normal view.
Please enter a layout name.	A layout can only be saved under a name.	Enter a name and try again saving.
Please wait, no exposure series start allowed for "..."	The X-ray tube is very hot. The message indicates the waiting time until series exposures can be started.	For continuous tube protection, let tube cool down as needed.

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Message	Possible causes	What can be done
Please wait, no single exposure start allowed for "..."	The X-ray tube is very hot. The message indicates the waiting time until a single exposure may be started.	For continuous tube protection, let tube cool down as needed.
PLEASE WAIT: Detector not at operating temperature; possible lower image quality	The detector has not yet reached the operating temperature required for optimum image quality.	Please wait a few moments.
PLEASE WAIT - calibration is running	You cannot release exposure because the detector is still busy calibrating.	Please wait until the message disappears.
PLEASE WAIT - Connecting the portable detector ...	The system is connecting the portable detector.	Please wait a few moments.
PLEASE WAIT - Detector connection completed	The portable detector has been connected successfully and can be used after the initialization now following.	-
PLEASE WAIT - Disconnecting the detector...	Appears during the disconnection procedure of the wireless portable detector.	-
PLEASE WAIT - Initializing detector(s)	You cannot release exposure because the system is still busy initializing and connecting detectors.	-
Please wait - Retrieving examinations from RIS: "..."	Progress information for broad RIS query.	Wait until the process is finished.
Please wait - System still busy selecting the examination program ...	The system is still busy selecting and distributing new examination program data.	Wait until the message disappears.
Possible exposure run time: "..."	The X-ray tube is very hot. The message indicates the expected possible runtime until tube overload.	Wait until the indicated possible exposure run time is as needed.
Press any key on the remote control to initialize it. Do not press the deadman switch!	The user tries to start an automatic movement the first time after system start-up without initializing the remote control. The remote control needs to be initialized to ensure that the deadman switch is working correctly.	Press any key on the remote control to initialize it. Do not press the deadman switch!
Printing report ...	Report printout was started.	-
Print job canceled. Status is: "..." (status code: "..." "...")	Software/Configuration problem.	Internal error. Call service.
Print job failed. Status is: "...".	Printer not ready or not connected to network.	Check printer and network connection. If the problem persists, call service.
Print job failed. Status is: "..." (status code: "..." "...").	Software/Configuration problem.	Internal error. Call service.

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Message	Possible causes	What can be done
Privacy rules are enabled. If you add this job to the queue, images of multiple patients will be exported to DICOM Media. Do you want to continue?	Encryption of DICOM media is enabled. You have tried to add a job for a patient that differs from the patients already existing in the queue.	Click YES to confirm that jobs of different patients will be exported or decline with NO. In case of NO, the job will not be added to the queue.
Processing new examinations: "..." of "..."	Broad RIS query: new examination data are processed.	Wait a few seconds until the process is finished.
Query/Retrieve is restricted to RIS patients only.	The selected search source is a PACS. Query/Retrieve is configured to be restricted and the selected patient is NOT a RIS patient.	-
Query result: No suitable match found	No matching search results have been found during a query.	Modify query attributes and start a new query.
Reduced power supply to the generator. Generator may not run with its highest possible performance. The exposure time might be longer.	The main power supply may be insufficient, the generator adjustment may be incorrect, or the generator may be defective.	Click OK.
REMOTE SERVICE is active. Do not use on patients!	A remote service session is active with your system.	You must not operate the system with patients as long as remote service is active.
Removed one or more jobs from printing queue, because printer is no longer present.	Printer was removed from configuration.	Only for information. Jobs must be started again manually.
Remove this reject reason: "..." ?	You are about to remove an entry from the list of selectable image reject reasons.	Confirm with YES or reject with NO.
Restore the last applied licence file and shut-down program now?	You are about to reset the licence file. The current licence file is replaced with the last applied one.	Press YES to reset the licence file and exit the application (computer reboot necessary). NO to keep the current licence file.
Retrieved images cannot be exported. Do you want to export all local images for this patient instead?	Images that have been retrieved from PACS cannot be exported again.	Press YES to export the patient's local images instead.
Retrieving images from network ...	A Query/Retrieve query to a PACS is running.	Please wait until the images have been transferred.
Revert to accepted is not possible. There is not yet any accepted image processing protocols.	There is no accepted image processing protocols which the system can revert to.	Imaging protocols must have been accepted before this function can be used.
RIS query: worklist has been updated	Based on the RIS query, your worklist was automatically updated.	-
RIS query in progress ...	A RIS query is currently active and is not yet finished.	Wait for RIS query success or abort if necessary.

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Message	Possible causes	What can be done
Scaling conflicts with film layout or pages incomplete - page(s) not printed!	An image does not fit into the print layout without changing size or cutting image parts; or a film page is incomplete.	Go to the “Print” tab and solve the conflict or set another scaling conflict behavior to automatically solve conflicts of this type.
Selected geometry position is not reachable.	The geometry position can not be reached.	Check positions of all components.
Service export job has failed: “...”	An export to the service partition has failed. There may be missing space on hard drive or an error during creation of the file.	In case of missing space on hard drive, try to make more space available. In other cases, call service.
SERVICE MODE is active. Do not use on patients!	A local service session is active with your system.	You must not operate the system with patients as long as service mode is active.
Severe Error – Please restart the system immediately! You may continue working if necessary, but this is not recommended.	A software error has occurred.	If this error occurs frequently, call service.
SkyFlow cannot be applied	SkyFlow could not be applied, probably because the image was taken below 60 kV. If the problem occurs with generator settings above 60 kV, restart the system.	-
Software download: “...”% (“...” minutes remaining)	-	-
Software download: “...”% (“...” seconds remaining)	A software update is downloading.	Wait until the process is finished.
Software download is completed.	A software update download is complete.	The update can be installed.
Software download was canceled.	The software update download has been canceled.	-
Software Error on RF viewer – Restart the system. You may continue working without using the “Fluoro and spot images” registration device. Do you want to see this message again in case another error occurs?	An unanticipated software error has occurred on the RF viewer. This affects only fluoroscopy and exposures performed using the “Fluoro and spot images” registration device.	If this error occurs frequently, call service. You can suppress this user guidance by selecting NO.
Software Error – Restart the system. You may continue working if necessary, but this is not recommended. Do you want to see this message again in case another error occurs?	An unanticipated software error has occurred.	If this error occurs frequently, call service. You can suppress this user guidance by selecting NO.

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Message	Possible causes	What can be done
Stitching - auxiliary not supported	Only corresponding “stitching” auxiliaries can be selected, when a special procedure program for stitching is active. Auto stitching is only possible on table or wall stand with digital detector, CR stitching only with free cassette auxiliaries.	Select an appropriate auxiliary. Or select a different exposure program.
Stitching run aborted by operator	Pressing the exposure button was interrupted while the stitching run was not yet completed.	Manually move the source assembly back into the start position. Always hold the exposure button until the stitching run is completed.
Stitching run completed.	The automatic stitching movements are completed.	You may now let go of the exposure hand switch.
Stitching test run aborted by operator	A stitching test run was interrupted, for example, by pressing a brake button for the ceiling suspension.	Manually move the source assembly back into the start position. Do not press any button during a test run, except if you want to stop the run.
Stitching test run aborted - detector drive error (collision?)	A stitching test run was aborted because an error has occurred at the detector drive while moving, for example, a collision.	Make sure that the detector can move freely. Manually move the source assembly back into the start position. Start again.
Structured Dose Reports cannot be exported as the DICOM SR node is not available. There are already “...” reports in the “sending failed” export queue.	The connection to the DICOM SR node is interrupted or the configuration of the connection is not valid.	Check if the server is switched on. Check the server connection. For detailed information see the according chapter in this document. If the problem remains, call service.
Sure to permanently store exposure program modifications?	Exposure program modifications will only be stored after confirmation.	-
System is busy deleting old examinations ...	The system is busy deleting old examinations in the patient database. This may slow down system performance.	It is safe to use the system as usual; however you should be aware of possibly slower than normal system response.
System is ending your open jobs and shutting down	The system shut down has been triggered.	Wait until the shutdown is completed. Press the power-on button to start the system again.
System is entering the sleep mode	The system was left unused and not connected to the mains for a certain time or the operator has triggered the sleep mode manually.	Wait until the system has entered the sleep mode. If required, exit the sleep mode.
System is shutting down.	The System Power Off or Restart was requested.	-

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Message	Possible causes	What can be done
System settings have been changed that require a system restart . Restart the system now? Select NO for leaving the system tab without restart , this will discard any changes. Select CANCEL to continue working in the system tab.	Changes have been made in the system tab section that require a system restart.	Select YES to immediately restart the system or select NO to discard all changes. Select CANCEL to proceed changing the system settings.
System update ultimately denied	Confirmation message that a pending system update was ultimately refused by the operator.	-
System update was successful.	The system update performed before the last power down was successful.	-
The "..." is not responding. Restart the system. If the problem persists, call service.	The control handle display is not responding.	Restart the system. If the problem persists, call service.
The ambient light value for contact measurement is missing. Enter a value or change to the distance measurement method to verify the DICOM compliance of the monitor.	The monitor verification procedure was started without entering a valid ambient light value for the selected contact measurement method.	Enter a valid ambient light value or use the distance measurement method.
The backup cable must be connected for enabling or disabling the wireless connection. Please connect the cable.	The wireless connection to the portable detector can only be disabled or enabled while the detector is connected via the backup cable.	Connect the backup cable, then press OK.
The battery of the portable detector is empty. Exchange the battery or attach a different detector.	The battery of the recently attached portable detector is too low to perform exposures.	-
The battery of the portable detector is empty. Exposures are not possible anymore.	The battery of the portable detector is empty.	Exchange the battery of the portable detector.
The battery of the portable detector is low.	The battery of the portable detector is low.	Exchange the battery of the portable detector as soon as possible.
The calibration length entered is invalid (too low). Please enter a higher value.	The calibration length entered is too low (less than 75% of the distance in detector plane).	Enter a higher value.
The calibration length value entered is invalid (too high). Please enter a lower value.	The calibration length entered is too high (more than double of the distance in detector plane).	Enter a lower value.
The CD/DVD has successfully been created. Patients on disc: "..."	All jobs from the queue has been successfully burned on the CD/DVD.	-

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Message	Possible causes	What can be done
The changes you have made require you to restart the system before they can take effect. Do you want to restart the workstation?	A system configuration has been changed that needs a restart to become fully effective.	Press OK to immediately restart the system. Press “Cancel” if you want to manually restart the system later.
The CR image to be moved is associated with exposure data. Move the exposure data together with the image?	The CR image that you have selected for moving into another examination is associated with exposure data.	Select YES to move the exposure data together with the image. Select NO to keep the exposure data in its place and move the image only.
The date of birth entered is in the future. Please enter a valid date.	The entered date of birth is in the future.	Enter a date in the past.
The date of birth entered is invalid or incomplete. Do you want to go back to the previous date?	The date of birth entered is not valid (for example, no month entered).	Press NO to return to the dialog and correct the input, press YES to revert to previous values.
The date of birth entered is invalid or incomplete. Please fill in correctly or clear the fields.	The date of birth entered is not valid (for example, no month entered).	Press “OK” and fill in the missing values.
The default export target is used because of missing entry for [“...”] in the export destination settings.	The table in “System/Settings/Export destinations” contains no valid entry for the used export scheme.	The advanced user or customer service should select a valid export target for this export scheme in the export destination table.
The default printer is used because of missing entry for [“...”] in the print destination settings.	The table in “System/Settings/Print destinations” do not contain a valid entry for the used print medium type.	The Advanced User should select a valid printer and format for this medium type in the print destination table.
The detector calibration image seems to be generated using a grid. A grid must not be used during detector calibration. Please remove the grid.	The detector calibration procedure was started while the grid has not been removed.	Remove the grid and restart the procedure.
The detector cannot be connected when CASSETTE is selected.	You are trying to connect a wireless portable detector while at the Eleva Workspot CASSETTE is selected.	At the Eleva Workspot select DETECTOR and try to connect the detector again.
The detector has not reached operating temperature. Releasing an exposure might result in a lower image quality. It is recommended to wait up to 20 minutes until the detector has reached the right temperature or to perform a calibration.	The current temperature of the detector is deviating from the calibrated operating temperature.	Wait until the detector has reached the operating temperature for optimum image quality (this can take up to 20 minutes) or perform a new detector calibration.
The detector is performing an initial configuration. This may take some time. Afterwards, the detector restarts automatically and can be attached.	This message is shown during a service activity. An unknown portable detector was attached for the first time.	Continue according to service documentation.

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Message	Possible causes	What can be done
The detector temperature is "..." higher than allowed. Wait until the detector temperature is in range or perform a new calibration with the current detector temperature.	The detector temperature is above the allowed calibration temperature range.	The current detector calibration is not valid for the current detector temperature. Go to System – Portable detector. In the table, compare the calibration temperature range with the current temperature. It is recommended to wait until the detector temperature is in range or to perform a new calibration with the current detector temperature.
The detector temperature is "..." higher than recommended. The system is ready for X-ray. However, the image quality may be affected. It is recommended to wait until the detector temperature is in range.	The detector temperature is above the recommended calibration temperature range.	Go to System – Portable detector. In the table, compare the calibration temperature range with the current temperature. It is recommended to wait until the detector temperature is in range.
The detector temperature is "..." lower than allowed. Wait until the detector temperature is in range or perform a new calibration with the current detector temperature.	The detector temperature is below the allowed calibration temperature range.	The current detector calibration is not valid for the current detector temperature. Go to System – Portable detector. In the table, compare the calibration temperature range with the current temperature. It is recommended to wait until the detector temperature is in range or to perform a new calibration with the current detector temperature.
The detector temperature is "..." lower than recommended. The system is ready for X-ray. However, the image quality may be affected. It is recommended to wait until the detector temperature is in range.	The detector temperature is below the recommended calibration temperature range.	Go to System – Portable detector. In the table, compare the calibration temperature range with the current temperature. It is recommended to wait until the detector temperature is in range.
The detector temperature is getting too high. The detector will shut off soon. Finish the current examination and stop working. Call service.	The detector temperature is getting too high. The detector will shut off soon.	Finish the current examination and stop working. Call service.
The detector temperature is too high. The detector has been shut off. The system tries to restart the detector automatically after 10 minutes. Call service.	The detector temperature has reached the automatic shutdown temperature.	For emergency use try to continue working after the detector is restarted. Call service.
The detector will shut off soon - high temperature.	The detector temperature is getting too high. The detector will shut off soon.	Finish the current examination and stop working. Call service.
The encrypted DICOM medium will contain images of multiple patients. If this is not intended, remove all jobs of other patients from the "Prepared for writing" queue.	You are enabling the DICOM media encryption and there are jobs of multiple patients in the "Prepared for writing" queue.	Adapt the "Prepared for writing" queue and ensure that only one patient remains in the queue.

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Message	Possible causes	What can be done
The end of the scan range is reached. The Area Scan has been stopped.	The column has reached the movement end position and has stopped automatically.	If the desired anatomy has not been covered completely, check the movement range of the column manually.
The entered date: "..." is not valid.	The year to be entered must be in between 2006 and 2037.	Enter the correct year.
The entered minimum password length is invalid. The value must be 8 or greater.	Password length values smaller than 8 are not accepted.	Enter a value equal to 8 or greater.
The font sets for the following film sizes are missing: "...". This will lead to printing problems.	The film sizes are not known by the system.	Configure the missing film size/font sets tables.
The height of the X-ray tube assembly (ceiling suspension) is too close to the mechanical end stop. To adjust the position, switch on tracking or move down the X-ray tube assembly manually.	During the adjustment of a geometry position the tube assembly was located in a restricted area.	Switch on tracking or move down the X-ray tube assembly manually. Store the geometry position under the same description.
The image cannot be processed. Restart the system.	The last received image is still being processed.	Restarting the system will recover the image and start the processing again.
The image cannot be recovered and will be deleted. Retake the image.	The current image cannot be processed.	Confirm the message and retake the image.
The last image could not be retrieved from the portable detector. You may also try using the backup cable. Press OK to retry a transfer. After another unsuccessful attempt you will be given the option to delete the defect image. Press CANCEL to continue working with a different device. The image may then be retrieved later.	The last image could not be retrieved from the wireless portable detector and still resides in there. This may be the result of a WiFi connection problem or low battery.	Press OK for a retry. Connect the backup cable.
The last image could not be retrieved from the portable detector in spite of several attempts. Do you want to dismiss that image? (Press NO for another retry)	In spite of several attempts the last image could not be retrieved from the wireless portable detector. Probably the image data are corrupted.	Press YES to dismiss that image and free the detector for further use. Press NO for further transfer retries.
The last system shutdown was a hard shutdown! This can corrupt your system data. To avoid hard shutdowns, do not switch off the system by applying: - The emergency switch - The switch off button for more than 3 seconds (if your system has this button).	The system has not been shut down properly using the software button or by pressing the switch off button on the monitor shortly (one second).	Avoid hard shutdowns. Always shut down the system via the software buttons or apply the switch off button on the monitor shortly.

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Message	Possible causes	What can be done
The layout name is already used by another layout. Please choose a different name.	The selected name already exists.	Choose a new name.
The licence "..." is missing to perform this action.	The user tried to perfom an action that is is not permitted due a missing software licence.	Install a valid licence.
The licence file could not be found.	No licence file found in the specified drives.	Put the licence file in one of the specified drives. Following drives are valid: –floppy a:/ –service drive f:/ –cd/dvd i:/ –memory stick1 j:/ –memory stick2 k:/
The loudspeakers are not working. Check if the loudspeakers are connected to the workstation.	The loudspeakers are not connected to the workstation.	Ensure that the loudspeakers are connected.
The movement is currently disabled: - The safe zone for the ceiling suspension is not adjusted. - The ceiling suspension position is unknown. After confirmation the table movement is unlocked. Always ensure that there is no collision with the ceiling suspension.	The movement is currently disabled due at least one of the following reasons: - The safe zone for the ceiling suspension is not adjusted. - Due to a technical issue the ceiling suspension position is unknown.	Confirm the user guidance. Afterwards the safe zone supervision is disabled and the table movements are unlocked. Always ensure that there is no collision with the ceiling suspension.
The MPPS server cannot be reached. This will result in low storage space on this workstation.	The connection to the MPPS Server is interrupted or the configuration of the connection is not valid.	In most cases the MPPS Server is identical to the RIS Server. Check if the server is switched on. Check the server connection. If the problem remains, call service.
The new password entered is invalid. A valid password should: - have a length of at least 8 characters - hold at least one lower case character and one upper case character - hold at least one digit - hold at least one special character (characters other than 0 through 9, a though z and A through Z). Make sure that the entered new password and the confirmation are equal.	The password couldn't be changed because the entered new password is not valid.	Confirm the message and enter a valid new password.
The new password entered is invalid. Make sure that "..."	The password couldn't be set or changed because the entered new password is not valid.	Confirm the message and enter a valid new password.

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Message	Possible causes	What can be done
The new password is invalid. Make sure that the new password and the confirmation are equal.	The password couldn't be changed because the entered new passwords were not equal.	Confirm the message and enter the correct password twice.
The old password entered is incorrect.	The password couldn't be changed because a wrong old password was entered.	Confirm the message and enter the correct old password.
The passwords you have entered do not match.	The two password entries do not match.	Enter exactly the same password twice.
The patient "...", "..." ["..."] could not be deleted, because this patient is protected. Please remove protection and try again.	A patient entry could not be deleted because of its protection status.	Unprotect the patient and try again.
The patient database size exceeds the configured warning threshold. It is recommended to free space, e.g. by closing finished exams and manually deleting all entries that are no longer needed.	In spite of automatic deletion of completed entries, the patient database is filling up to a level higher than set.	Make it a rule to close examinations directly after finishing. Free space is provided by manually deleting all unnecessary examination entries.
The patient database takes too much space. Delete older suspended examination entries?	The system could not clear enough space upon deleting old examination entries. There might be unnecessary old examination entries which have never been set to interrupted or closed.	Press "Yes" to have the system delete not yet closed examination entries.
The Portable detector could not be connected. Please plug in the backup cable and try again.	Connecting the of the portable detector was not possible, because the backup-cable is not plugged in.	Connect backup cable and try again.
The portable detector has reached its maximal surface temperature of 41 °C / 106 °F. Exchange the battery and let the portable detector cool down.	The portable detector is placed in a hot environment or the battery might be warm.	Exchange the battery, let the portable detector cool down, or use a detector holder.
The query to destination "..." failed.	A Query/Retrieve query to a PACS failed. Reason may be a wrong query node configuration, a network problem, or PACS down.	The administrator should check the network and PACS system. If the problem persists, please call service.
The ranger mode of the preset has been implicitely switched from Auto to Semi. Continue saving?	Contrast/brightness was modified resulting in a change from Automatic to Semiautomatic ranging. This might not be what is intended.	"Yes" will save the Preset in SEMI mode as it is. "No" will stop the save process. The Ranger mode can be changed in the Ranger panel of UNIQUE. Afterwards use Density1 and Density2 for changing the contrast instead of using the contrast in the Contrast/ Brightness Tool.

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Message	Possible causes	What can be done
There are examinations in progress and unexported or unprinted images may be lost. Anyway perform the update?	A software update is about to be started and images may be not yet exported or printed. Such images might be lost during the update.	Complete all patients/examinations and wait until export/print is finished.
There are print films ready to be checked in the 'Print' tab. Do you instead want to print them now without checking them first?	One or more pages have been marked for autoprint with user check.	Press “yes” to print all pages as they are. If “no” is pressed, the preview pages are not printed and the user has the opportunity to manually correct and print the pages in the 'Print' section.
There are scaling conflicts with the film layout or incomplete pages. Do you want to print the films anyway?	One or more images do not fit into the page according to the autoprint settings.	Press “yes” to print all pages as they are. If “no” is pressed, the pages with scaling conflicts are not printed and the user has the opportunity to manually correct and print the pages in the “Print” section.
There is free space on the CD/DVD for the next burn job waiting. Start burning now?	Images are waiting to be burnt on a CD/DVD and there is sufficient space available on the inserted CD/DVD for the next job that is queued for burning.	Select YES to immediately start burning on to the CD/DVD. Select NO, if you want to manually start CD/DVD burning at a later time or on a different CD/DVD.
There is no connection to the “...”.	There is no hardware connection or a software error between the workstation and the control handle display.	Restart the system. If the problem persists, call service.
There is no connection to the X-ray system. No power?	There is no connection to the X-ray system. Probably the system or parts of it are not powered.	The workstation may be used standalone. Image acquisition is not possible.
There is no connection to the X-ray system - probably the system is not powered up!	There is no connection to the X-ray system. Probably the system or parts of it are not powered.	The workstation may be used standalone. Image acquisition is not possible.
There is not enough free space on the CD/DVD. Please insert a new CD/DVD.	The current amount of data will not fit on the CD/DVD.	Insert a new CD/DVD.
The restore of the EPX database has failed. The last valid EPX database has to be activated manually.	During update procedure the EPX database could not be restored.	The last valid EPX database has to be activated manually.
The selected combination of auxiliaries is not supported.	The auxiliary selected at the Eleva Workspot cannot be used with the auxiliary selected at the generator console.	Check the selection of auxiliaries.
The selected mAs value is too high - no exposure will be possible!	Selected mAs is out of range (too high).	As appropriate, decrease mAs value or change kV or select large focal spot.
The selected view belongs to a closed examination. Do you want to create a new examination?	The currently selected view is part of a closed examination, for example, completed. Images cannot be added any more.	Select “YES” to create a new copy of that examination.

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Message	Possible causes	What can be done
The selection contains one or more structured dose reports. These reports will be permanently deleted and cannot be recreated. Do you really want to delete these reports?	The sending during export/print failed. You try to delete the tasks in the Sending failed section of the export/print queue.	If it is ok that the dose information gets lost, confirm with YES. If you want to keep the reports and try to send again, confirm with NO.
The short term license activation will expire in "..." days.	The short term license activation will expire in a few days.	See in "System/General/License status" which licenses are affected. Call service, if you need a license that is no longer available.
The system cannot print because no printer and/or no print medium is defined ("..."). Call service.	The automatic printing found no valid printer and/or print medium in the print destination settings.	Call service to configure the available printers and print media properly.
The system has low memory. Please restart the system.	Memory Leaks in the system, the Virtual Machine is going to run out of memory.	Restart the system if this message does not vanish automatically.
The system has no disk space for storing images any more. You must complete patients immediately to continue working.	The tidy up could not delete images because examinations are protected against automatic deletion unless they are completed.	Complete all examinations that are currently in progress but are not needed any longer and reboot the system afterwards.
The system is running out of memory. Please restart the system immediately.	The system is out of memory.	Restart the system. If this message occurs often please call service.
The system is running out of memory. Please restart the system immediately in order to avoid data loss.	The system is out of memory.	Restart the system. If this message occurs often please call service.
The system is trying to read out the image from the portable detector. This may take a while.	The initial image read out was interrupted. The system is trying to recover the image.	Wait until the user guidance disappears.
The system rollback failed! The system software is an inconsistent state now. WARNING - The system must not be used on patients!	A previous system software update rollback action failed.	Call service immediately! Do not use the system on patients!
The system update failed! The system is an inconsistent state now. WARNING - The system must not be used on patients!	A previous system software update installation action failed.	Call service immediately! Do not use the system on patients!
The target view already holds exposure data. Combine the inserted image with these exposure data?	The target view into which you want copy the CR image already holds exposure data.	Select YES to associate the exposure data with the image. Select NO, if the exposure data do not belong to the image.

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Message	Possible causes	What can be done
The update can only be installed if all examinations have been completed and all images have been printed or exported. Complete all examinations first; then login again to start the installation process.	It is not possible to perform a software update since there are exams still open and images might have not yet been exported or printed. Installing a software update in this situation might lead to loss of images or data.	Complete all patients/examinations and wait until export/print is finished; then try again to update.
The wall stand is too close to the mechanical end stop of the height axis. To adjust the position, increase the distance between the wall stand and the end stop.	During the adjustment of a geometry position the wall stand was located in a restricted area.	Increase the distance between the wall stand and the end stop of the height axis. Store the geometry position under the same description.
The wall stand is too close to the mechanical end stop of the longitudinal axis. To adjust the position, increase the distance between the wall stand and the end stop.	During the adjustment of a geometry position the wall stand was located in a restricted area.	Increase the distance between the wall stand and the end stop. Store the geometry position under the same description.
The wireless portable detector is unavailable. Please check detector presence and battery power state. - If no detector is present, press CANCEL. - If the detector has been connected to a different system, press CANCEL. - If there is no battery power, you have to connect the backup cable. Then press OK.	The wireless portable detector may be out of reach or its battery may be empty and needs to be recharged.	If the battery is empty, connect the backup cable, then press OK. If no portable detector is present, or if the detector has been connected to a different system, press CANCEL. If the detector was out of reach but is present now, press OK.
The X-ray tube assembly (ceiling suspension) is too close to the mechanical end stop of the lateral axis. To adjust the position, increase the distance between the X-ray tube assembly and the end stop.	During the adjustment of a geometry position the tube assembly was located in a restricted area.	Increase the distance between the X-ray tube assembly and the end stop. Store the geometry position under the same description.
The X-ray tube assembly (ceiling suspension) is too close to the mechanical end stop of the longitudinal axis. To adjust the position, increase the distance between the X-ray tube assembly and the end stop.	During the adjustment of a geometry position the tube assembly was located in a restricted area.	Increase the distance between the X-ray tube assembly and the end stop. Store the geometry position under the same description.
This action will remove the layout-link. Continue?	You are about to remove the layout-link, e.g. by adding a new string group.	Confirm with YES, abort with NO.
This change requires a system restart to take effect. Restart the system now? Select NO to continue changing system settings and restart the system later. CANCEL will discard the change.	A change has been made in the system tab section that need a system restart to come into effect.	Select YES to immediately restart the system or select NO to continue without a restart. Select CANCEL to discard the change.
This detector is not compatible. Attach a compatible detector.	You have tried to attach a detector from a different system that is not compatible.	Use a compatible detector or call service for more information.

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Message	Possible causes	What can be done
This examination should not be completed for the following reasons:"..."Do you still want to complete this examination?	Warning message that the user is about to complete an examination which should not be completed for one of these reasons: - Routine views exist, which are not executed! - Images exist, which are not printed! - Images exist, which are not archived! - Links to acquisitions exist, which plates are not read out!	-
This ID is already assigned to an existing patient. A new one has been created automatically.	The user has entered a patient ID to create a new patient data set, which is already assigned to an existing patient.	Please select another ID for this new patient data set.
This name already exists.	The new name cannot be entered into the performing physician list since the same name already exists.	-
This page switch would disable radiation. Nevertheless leave the examination main page?	You are about to change to a context (main page) that does not allow radiation release.	Select YES to proceed, select NO to stay in the current context.
This patient should not be completed for the following reasons: "..." Do you still want to complete this patient?	Warning message that the user is about to complete a patient who should not be completed for one of these reasons: - Routine views exist, which are not executed! - Images exist, which are not printed! - Images exist, which are not archived! - Links to acquisitions exist, which plates are not read out!	-
Too small SID limits fieldsize	The SID is set so small that the cassette cannot be irradiated at full size.	Increase SID.
To take an exposure on cassette, disconnect the detector "..." via the infrared sensor.	At the Eleva Workspot the auxiliary was changed from DETECTOR to CASSETTE.	Disconnect the wireless portable detector by holding the infrared sensor of the detector in front of the infrared adapter. Check the label.
Tube conditioning program running ...	The X-ray tube conditioning generator mode is currently selected.	Call service immediately!
TUBE CONTROL HANDLE PROBLEM - key number "..." is sticking!	Upon start-up, a continuously active button has been detected at the 2nd beam control handle. The corresponding function cannot be executed.	Try to have the sticking button operate again by pressing it several times. Press the "Test" key at the control handle to have message disappear. Call service, if the button continuously refuses to operate correctly.

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Message	Possible causes	What can be done
TUBE OVERLOAD - exposure run aborted	The exposure run was aborted because the X-ray tube overload limit was reached.	Observe tube heat status before starting high load exposure runs.
UM image processing parameter "..." out of range. "..." used instead. Correct protocol or use another one.	An UM image processing protocol is invalid. One parameter is out of the allowed range.	Correct the invalid parameter of the current protocol or select another protocol. You should save your changed protocol or change the reference of the protocol in the EVA tool.
Unable to create the user "...".	-	-
Unable to delete patient while active jobs exists. Please wait for completion.	Pending job(s) forbid(s) the deletion of patient data.	Wait until all active jobs are done.
Unable to link bar code since examination is closed. Do you want to create a new examination?	Examination is closed and user tries to create bar code link (directly or implicitly in AC3 mode)	Clone the closed examination or accept that no bar code will be created.
Unable to parse values. Please correct your input. Fill in all fields starting with the highest optical density value (e. g. 3.0).	During monitor calibration, inconsistent or wrong values have been entered.	Confirm the message and restart the calibration entering correct values.
Unable to parse values. Please correct your input. Fill in all fields starting with the lowest luminance value.	At least one entered export calibration value is invalid.	Confirm the message and enter valid values.
Unable to reach the workspot server. Please switch on the workspot server and/or check the connection.	Workspot server is switched off or network connection is broken or misconfigured.	Check if the workspot server is running. Check network connection. If problem remains, call service.
Unable to write file "...". The disk may be full.	Disk is full or file is write protected.	Remove patients or images to make space on the disk.
Unable to write image to file. The disk may be full.	Disk is full or file is write protected.	Remove patients or images to make space on the disk.
Undefined export destination, exporting to "...". Check export destinations.	The export destination setting for the default export target was not set or invalid. The system created automatically a default setting as a fallback.	Check the new settings in system/settings/ export destination and correct these, if necessary.
Undefined print destination. Printing on "..." using the format "...". Check print destinations.	The print destination setting for the default printer was not set or invalid. The system created automatically a default setting as a fallback.	Please check the setting in system/settings/ print destination and correct it, if necessary.
UNIQUE conversion: "..." of "..."	At system start UNIQUE image processing protocols were found. The system is converting them to the new image processing.	Wait until all presets have been converted.

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Message	Possible causes	What can be done
UNIQUE image processing parameter "..." out of range. "..." used instead. Correct protocol or use another one.	A UNIQUE image processing protocol is invalid. One parameter is out of the allowed range.	Correct the invalid parameter of the current protocol or select another protocol. You should save your changed protocol or change the reference of the protocol in the EVA tool.
User name already exists.	There is already a user with the name you entered.	Enter a different new user name.
Validating system database. Please wait ...	Some functions may not be available while the system is busy validating a new exposure program data set.	This may take some minutes.
Very low PC battery - Charge as soon as possible.	The PC's battery charge level is less than 30%.	Connect the unit to the main power supply as soon as possible.
Wall stand: cassette not correctly inserted or invalid cassette size	An invalid cassette size was detected in the wall stand, e.g. not inserted centrically.	Remove and re-insert cassette correctly. Only use specified cassettes.
Wall stand: Detector not correctly inserted or invalid size	An invalid detector size was detected in the wall stand, for example, not inserted centrically.	Remove and re-insert the portable detector correctly.
Wall stand arm swing position must be locked for any movement	Automatic wall stand movements are inhibited while the detector arm swing is not locked into 0° or 90°.	Lock the arm swing in any of these positions before starting any movement.
Wall stand collision switch active	-	-
Wall stand detector swing position must be locked in 0° position	Wall stand automatic movements and tilting are inhibited while the detector swing axis is not locked into 0°.	Lock the detector swing axis in 0° position before starting such movement.
WALLSTAND PROBLEM - a key is sticking!	Upon start-up, a continuously active button has been detected at the wall stand control panel. The corresponding function cannot be executed.	Try to have the sticking button operate again by pressing it several times. Press the "test" key at the control handle to have message disappear. Call service, if the button continuously refuses to operate correctly.
WARNING: Collision danger - 2nd tube not in safe zone	The safe zone supervision is disabled and the table movements are unlocked. The user guidance "Safe zone unknown" has been confirmed.	Restart the system to get the position of the ceiling suspension. If the error remains, call service.
WARNING: Detector temperature "..." too high	The detector temperature is out of the calibration temperature range.	Go to System – Portable detector. In the table, compare the calibration temperature range with the current temperature. It is recommended to wait until the detector temperature is in range.

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Message	Possible causes	What can be done
WARNING: Detector temperature "..." too low	The detector temperature is out of the calibration temperature range.	Go to System – Portable detector. In the table, compare the calibration temperature range with the current temperature. It is recommended to wait until the detector temperature is in range.
WARNING: The DICOM SR node is still not available. Reports will be lost. The "Sending failed" export queue can hold another "..." reports, until the oldest are deleted automatically. Deleted reports cannot be recovered!	The connection to the DICOM SR node is interrupted or the configuration of the connection is not valid.	Check if the server is switched on. Check the server connection. For detailed information see the according chapter in this document. If the problem remains, call service.
WARNING: This will accept all previously unaccepted presets and make them persistent. Previously accepted values will be replaced and cannot be restored. Do you really want to proceed?	You are about to accept all processing presets. The corresponding values will be stored and will replace any values previously accepted. These will be lost and cannot be recovered.	Press YES to confirm.
WARNING: This will reject the selected presets and replace by previously accepted values. Rejected values cannot be restored. Do you really want to proceed?	You are about to reject the selected processing presets. The corresponding values will be replaced by previously accepted values and cannot be recovered.	Press YES to confirm.
WARNING: You are about to delete a patient that is protected by deletion rules. This patient has missing storage commitments! Do you want to delete this patient? "...", "..." ["..."]	The Advanced User is about to delete a patient with missing storage commitments.	-
WARNING: You are about to delete a patient who is protected by deletion rules. The patient has incomplete or rejected print or export jobs. Do you want to delete this patient? "...", "..." ["..."]	Warning message that the user is about to delete a patient who has incomplete or rejected print or export jobs.	-
WARNING: You are about to delete a patient who is protected by deletion rules. The patient is still under examination. Do you want to delete this patient? "...", "..." ["..."]	Warning message that the user is about to delete a patient who is still under examination.	-
WARNING: You are about to delete a patient who is protected by deletion rules. There are failed jobs present for the patient! Do you want to delete this patient? "...", "..." ["..."]	Warning message that the user is about to delete a patient for whom failed jobs are present.	-

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Message	Possible causes	What can be done
WARNING: You are about to reset all selected factory presets to default values. Any selected user defined presets are ignored. Do you really want to proceed?	You are about to reset the selected factory processing presets to the defaults. User-defined presets will be kept unchanged.	Press YES to confirm.
WARNING! 80% of maximum tube heat load level exceeded.	The X-ray tube heat storage capacity is used by 80%.	Try to avoid heavily loading the X-ray tube, otherwise the tube load limit will be reached soon, resulting in a not-ready condition or possible tube damage. Let cool down, if possible.
Warning! DICOM Storage Commitment has failed "..." times since the last startup. The system cannot automatically delete patients with failed storage commitments. This may slow down the system performance. Check the configuration of the DICOM nodes and the PACS and correct the settings.	Several jobs for storage commit have failed since the last startup of the system. This might be caused by a wrong configuration of the DICOM nodes to the PACS or of the PACS itself.	Check if the PACS supports the DICOM Storage Commitment functionality. If the PACS does not support it, disable the setting for storage commitment for the according DICOM nodes. If the PACS supports it, check the configuration of the DICOM nodes and the PACS and correct the settings.
WARNING! The image to be moved is from a different patient folder!	You are going to move an image from one patient folder to another one.	Check that this is what you intended.
WARNING - a calibration step was not performed as required, e.g. settings have been modified from default or the field size is too small. Please check your workflow and settings. Only the recommended default settings should be used.	During a calibration or test, an item was executed using other than the default settings or a different order. It is strongly recommended to only perform calibration or test procedures using the default settings, appropriate collimation, and follow the prescribed order.	Observe the prescribed order and recommended settings. Only use the default adjustments.
WARNING - A gain calibration must be performed first!	During a calibration or test a previous gain calibration was skipped. It is strongly recommended to perform calibration or test procedures in the prescribed order.	Perform the gain calibration first.
WARNING - Air kerma limit exceeded!	The predefined air kerma limit has been exceeded.	Consider possible adverse radiation effects on your patient when proceeding.
WARNING - An item has been skipped. Please perform all acquisitions in the order prescribed.	During a calibration or test an item has been skipped. It is strongly recommended to perform calibration or test procedures in the prescribed order.	Do not skip any item.
WARNING - An offset calibration must be performed first!	During a calibration or test a previous offset calibration was skipped. It is strongly recommended to perform calibration or test procedures in the prescribed order.	Perform the offset calibration first.

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Message	Possible causes	What can be done
WARNING - A pixel calibration must be performed first.	During a calibration or test a previous pixel calibration was skipped. It is strongly recommended to perform calibration or test procedures in the prescribed order.	Perform the pixel calibration first.
WARNING - Corrupt attributes have been removed from RIS examination	At least one RIS examination had invalid data fields. These have been removed.	Check for missing information by comparing with the RIS data. Check for correct RIS entries. Call Service.
WARNING - current detector temperature is more than 8°C from gain calibration!	The detector temperature has changed significantly since the gain calibration. All calibrations should be performed at the same temperature level.	If the temperature difference cannot be lowered by waiting for cool-down or warm-up, repeat gain calibration at a more appropriate temperature level.
WARNING - Flat detector temperature exceeds warning level	-	-
WARNING - Free cassette selected, no flat detector image possible!	The selected auxiliary is “Free cassette”: the digital flat detector will not create any images when irradiated.	Select the correct auxiliary for using the digital flat detector. Only select “Free cassette”, if a “free” film or CR cassette is to be used.
WARNING - the current detector temperature does not match the temperature during gain calibration. Please ensure that the difference is less than 8°C!	The detector temperature has changed significantly since the gain calibration. All calibrations should be performed at the same temperature level.	If the temperature difference cannot be lowered by waiting for cool-down or warm-up, repeat gain calibration at a more appropriate temperature level.
WARNING - the current detector temperature is too high. Please check the ambient conditions and detector cooling, then try again.	Detector temperature is too high. Calibration or test procedures should not be started in such condition.	Check for correct ambient temperature and detector cooling, then try again.
WARNING - the current detector temperature is too low. Please retry after another hour.	Detector temperature is too low yet. Calibration or test procedures should only be started after the detector temperature has stabilized.	Please wait for another hour.
WARNING - the detector temperature is not yet stable. Please retry after another hour.	Calibration or test procedures should only be started after the detector temperature has stabilized.	Please wait for another hour.
WARNING - the kV is changed from the value used for gain calibration. This procedure should only be performed with the same kV setting.	During a calibration or test the exposure kilo voltage has been changed from the one that has been used for gain calibration.	Do not change the kV after gain calibration.
WARNING - This is not the correct item to start with. Please select the first item.	A calibration or test has not been started with the first item. It is strongly recommended to perform calibration or test procedures in the prescribed order.	Select the first item of the procedure and start.

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Message	Possible causes	What can be done
Worklistitem "..." for Patient "..." with StudyUID "..." could not be scheduled. This StudyUID is already assigned to "..." due to Worklistitem "...".	In the RIS, examinations for two different patients have been assigned the same StudyUID. The corresponding worklist item was skipped during RIS import.	Correct wrong data inside the RIS and then query the RIS again for the missing entry.
Writing on CD/DVD ...	CD/DVD burning in progress.	-
Wrong detector connected. Connect the correct detector or reboot the system.	A new detector was connected to the running system.	Reconnect the detector which was connected during the system startup, or restart the system to use it with the new detector.
WRONG EXPOSURE - Must correct technique factors!	The automatic exposure control was not able to finish at least one exposure properly. There is possibly an object in the radiation field which is considerably attenuating radiation or the exposure values selected are much too low.	You may have to set higher exposure values.
X-ray source longitudinal movements is not referenced. Please move once into reference lock position.	Servo-supported longitudinal movements in the defined range are only possible after the ceiling suspension longitudinal drive has been self-calibrating against a reference position.	Manually move the X-ray source longitudinal movement into the reference lock position once after startup. Then confirm the message.
X-ray source longitudinal movements is not referenced - please move once into center lock position.	Some automatic movements are only possible after the ceiling suspension longitudinal drive has been self-calibrating against a reference position.	Manually move the X-ray source longitudinal movement into the center lock position (table center) once after startup.
X-ray source tilt movement has no reference position - please tilt once into a lock position.	Automatic X-ray source movements can only be executed after the tube tilt drive has been referenced.	Manually put the X-ray source assembly tilt into the horizontal or vertical lock position once after startup. Try again.
X-ray tube is too hot!	The X-ray tube is too hot for further operation.	For continuous tube protection, let tube cool down as needed.
You are about to modify the Service User account. If you lose the new user name or password, the system will not be administrable on Service User level anymore. This problem can only be solved by a complete system reinstallation.	Shown when the Service User requests modification for his own account.	Click OK to confirm the message. Now you can either modify your account or cancel the action.
You are about to move an image out of a completed examination. Already sent image and dose reports will not be corrected automatically. Please update this information at RIS, PACS, etc. manually if needed. Do you want to proceed with the movement?	You have pressed the MOVE TO button.	If you want to move the selected image, click YES. If you don't want to move the selected image, click NO.

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Message	Possible causes	What can be done
You are about to move an image that has already been exported. Make sure to remove the exported image from PACS. Do you want to proceed with the movement?	You have pressed the MOVE TO button.	If you want to move the selected image, click YES. If you don't want to move the selected image, click NO
You are not allowed to delete patient data while the examination is still in progress. Please complete the examination first.	When examinations are in progress, only the user role Advanced User is allowed to delete patient data.	Complete examinations or login as Advanced User.
You are not allowed to delete patients while storage commitments are missing. Please wait until all storage commitments are received.	The user role is not allowed to delete patients where storage commitments are missing.	This can only done by the Advanced User or wait until all storage commitments are received.
You have performed changes in this section which have not been applied yet. Do you want to apply these changes before you proceed to the next section?	A tab is switched in the print configuration without saving the changes made in the previous tab.	Press YES to accept the changes or NO to reject changes on this tab. Press CANCEL to go back to this tab and continue editing.
Your password has been changed within the last 24 hours. You are not allowed to change your password more than once a day.	Due to the set password rules it is not allowed to change the password more than once a day.	Contact your local system administrator.
Your password is equal to one of your last passwords. Enter a password that is different from the last passwords you used.	Due to the set password rules it is not allowed to use the same password again.	Contact your local system administrator.
Your QA permissions differ from the current QA database. Upon login, the QA images will be lost! Nevertheless proceed with login?	The previous user logged out with active QA-Mode and the user now logging in has different QA privileges.	Press YES and accept that all QA-Images are lost at the workstation or press NO and have the previous user log in.
Your user role is not allowed to delete patients with open jobs. Please wait for job completion.	When examinations are still in progress and jobs are pending, only the user role Advanced User is allowed to delete patient data.	Wait for job completion or login as Advanced User.
Your user role is not allowed to delete the patient because failed jobs are present.	The user role is not allowed to delete patient data with failed jobs left.	This can only done by the ADVANCED USER.

* For limited emergency operation press the “OK” button on the dialog on the operator's console (if necessary repeatedly), until the message “CALL SERVICE!” disappears. Depending on the cause of the error, certain system functions will not operate.

List of Symbols

For the list of symbols, refer to the Instructions for Use CombiDiagnost R90.

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Glossary

AEC	Automatic Exposure Control
APR	**A**natomic **P**rogrammed **R**adiography; you can select the exposure type with the APR buttons. The exposure parameters are then set automatically.
Bottom position	See Center position
Button	A soft key shown on the screen that can be activated by clicking with the mouse.
Click on this	“Pressing” a soft key or activating an element on screen by pressing the mouse button.
DAP	Dose Area Product
Detector	This consists of a photoconductor which registers the incident X-radiation.
DICOM	**D**igital **I**maging and **Co**mmunication in **M**edicine. Medical technology standard for data formatting and transfer.
DR	**D**irect **R**adiography
EI_s	Exposure index
EPX	**E**xamination, **P**atient type, and **X**-ray operator related configuration data to control the system behavior
Exposure parameters	The X-ray exposure is determined by the three exposure parameters: Tube voltage (kV), Tube current (mA) and Exposure time (ms).
Focal spot	The point of the anode on which the electrons are focused.
GCF	Grid-controlled pulsed fluoroscopy
Images	• The unprocessed image (raw image) is produced by the detector and has full resolution. It is temporarily stored on the hard disk and is used for further preprocessing. It is only subject to a number of detector-specific corrections. • The control image is an image with reduced resolution. It is only used for control purposes during acquisition. This image is automatically deleted when the post image appears on the monitor. • The preprocessed image (pre image) is the result of a number of detector-specific corrections. It serves as the base for all further postprocessings. • The resulting image—the final or postprocessed image (post image)—is the image, which can be transmitted via DICOM or printed out. It encompasses all processing steps in terms of the specific anatomy and type of display. This includes: – Shutter – Region of interest – UNIQUE2-Processing (see section “UNIQUE2 Image Processing” in this glossary) – P-Value-Transformation according DICOM-Display-Standard (optional)
kV-mA-s technique	Three-button setting of exposure data: Tube voltage (kV), tube current (mA) and exposure time (ms) have to be set for the X-ray exposure.

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kV-mAs technique	Automatic two-button technique: Tube voltage (kV) and current-time product (mAs) have to be set for the X-ray exposure.
kV technique	Automatic single-button technique: Only tube voltage (kV) has to be set for the X-ray exposure. The other exposure data are determined by the automatic exposure control (Amplimat).
PACS	Picture Archiving and Communication System.
Patient data	All data belonging to a patient.
Print mode	Print mode determines the combination of layout and scale, e.g. 1 in 1 (one image on one film) or 2 in 1 (two images on one film) etc. In conjunction with the information in the window “HCU scale” print mode decides how the layout and scale are to be printed. The appropriate film size and the appropriate format (portrait, landscape) are selected automatically according to the following rules: 1. The scale is to stay the same. 2. As little film as possible is to be used. 3. The fewest possible black areas are to be generated. 4. Unused film areas are possible but should be avoided. 5. No information should be “cut off” from the image, even if this results in more film being used (black areas, unused film areas); in this case there is automatic switchover to a smaller scale. 6. If both portrait and landscape are available for selection, portrait is used automatically as this fits in the light box better. The user thus has no opportunity of selecting a specific film orientation or a specific film size; this is done by the system. The fifth rule means that if collimation is increased by a few millimeters, there is automatic switchover to a much larger film size, something that results in far more film being used. To avoid this, the fifth rule is overridden by the selection of “fixed scale”. This means that the scale is always set as defined in the field “HCU scale”. However, the edges of the image will be cut off in this case!
QA mode	**Q**uality **A**ssurance mode. Mode of operation which allows to perform detector calibration and constancy tests. During this mode clinical patients are hidden, and predefined QA patients are shown instead.
QA tool	**Q**uality **A**ssurance analysis tool. Allows evaluations (e.g. reject analysis and dose statistic) based on the locally available acquisition data log files. Provides history of test results from QA procedures (see QA mode) for Service.

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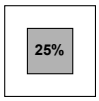
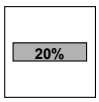
Ranging	The system finds the collimation, analyzes the histogram and determines with the key-percentage value the detector dose of the anatomical region of interest. • **Ranging Mode** Normally (semi mode) only one anatomical region of interest exist (for example, bone). For chest examinations (auto mode) two key-percentage values are used to determine the detector dose of the lung and the mediastinum. • **Key Percentage** Defines where in the whole histogram (100%) the anatomical region of interest is (for example, 25% for bone). • **Measure Field** Inside the mechanical collimation the system defines an area where the histogram will be analyzed out of. Four measure fields are available:  Full field (98/98%)  Half field (98/50%)  Quarter field (25/25%)  Slit field (20/80%)
R/F	Radiography and Fluoroscopy
RIS	**R**adiology **I**nformation **S**ystem; central data input and management terminal for the radiology department.
ROI	Region of interest
SID	Source-image distance
UNIQUE2	**Un**ified **I**mage **Qu**ality **E**nhancement, software for processing digital medical images made with Philips systems. UNIQUE2 = second generation of UNIQUE

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