Instructions for Use

RadiForce®
LS580W

8 MP 58" LCD Monitor

Important

Please read the safety information and all information delivered with the product carefully to familiarize yourself with safe and effective usage.

EIZO®

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ **DANGER**
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ **WARNING**
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ **CAUTION**
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that material damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Use of EIZO products

⚠ **WARNING**
EIZO products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by EIZO. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of their respective owners. Please refer to the trademarks listed in the appendix. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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1 Introduction

1.1 Contents of this document

This document explains the functionality and the approved use of the RadiForce LS580W. To ensure clarity, it does not contain all detailed information on this product.

The contents of this document are neither part of a previous or existing agreement, commitment or legal relationship, nor does it modify such.

Note
This documentation is available in electronic format only. It can be found on the CD-ROM provided and can be downloaded from www.eizo-or.com.

1.2 Intended use

Intended purpose

The RadiForce LS580W is intended for the display of still images and moving images from various commercially available devices commonly used in a medical environment, in particular radiology. The monitor is optimized for the reproduction of grayscale X-ray images. The monitor is not suitable for mammography.

Intended patient population and medical conditions

The LS580W can be used for the intended purpose irrespective of age, body weight and gender.

The LS580W is intended to be used in combination with or mounted on medical devices. The monitor therefore has no direct contact with the patient.

The LS580W is intended to display still images and moving images from various commercially available (medical) devices commonly used in a medical environment. The monitor cannot be used for direct diagnosis and as main device for monitoring live support equipment.

Intended users

The intended users for the LS580W are qualified healthcare professionals.

Intended environment

The LS580W is intended to be used in professional healthcare facilities such as clinics and hospitals. The monitor can be used in operating rooms (OR) or near patients, but is not limited to them. The monitor is not intended for direct patient contact!

The LS580W is not suited for the following environments:

- Home-based healthcare facilities.
- Near short-wave therapy devices.
- Near an MRI-System.
- Built into vehicles, including ambulances.

Note
Serious incident 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.

1.3 User groups

User

In the following, healthcare personnel such as surgeons or medical technicians are referred to as the "user".

Service / service personnel

"Service" or "Service personnel" identifies authorized personnel with knowledge of electrical and signal connection, local standards for image quality requirements, and safety of medical products, for example a hospital technician or manufacturer of medical devices.

Cleaning staff

"Cleaning staff" refers to personnel responsible for cleaning medical devices.

2 Safety information

2.1 General safety instructions

Correct and safe operation of EIZO devices assume professional transport, storage, installation, and connection, as well as careful operation and service.

The devices may only be used for applications for which they are intended.

For safety reasons, the following precautions must be observed:

⚠ **DANGER**

Please observe all warning information present on the device and in the instructions for use.

There is a danger to life if warnings are not obeyed. Severe personal injury or damage to property may occur.

Observe the safety requirements of EN 60601-1 (IEC 60601-1)

To prevent injury to patients and users, connect the electrical system in accordance with the safety requirements of EN 60601-1 (IEC 60601-1) for "Safety requirements for medical electrical systems".

Connecting the protective earth conductor

If the device is connected to line power, the device must be connected to a protective ground conductor. This is the only way to ensure that the touch leakage current in a first fault event does not exceed 500 µA.
The interruption of the device's protective conductor is considered a first fault event in accordance with EN 60601-1.

Use the following measures to ensure that the leakage currents remain below the specified limits:

- Separators for signal input unit or signal output unit
- Use of a safety isolating transformer
- Use of the additional protective ground terminal

Mounting of the monitor: The monitor's suspension arm must have its own protective ground conductor. This protective ground conductor guarantees, together with the protective ground conductor of the monitor, that the housing leakage current always remains less than 500 µA, even in the event of a single fault condition.

No unauthorized opening of the device / no unauthorized service or maintenance work

The device may only be opened by qualified personnel. Likewise, service or maintenance work may only be carried out by qualified personnel. There is a risk of electric shock.

No liability is accepted for death and injury to persons or damage to property resulting from work carried out by non-qualified personnel.

Do not touch components in the device

If the device is connected to the line power, components in the device are subjected to high voltages. Touching the components may be fatal.

No contact between device and patients

The device is not suitable for direct contact with a patient. The device and patient must never be touched simultaneously. Otherwise there is a danger to life and limb.

⚠ **DANGER**

Please observe all warning information present on the device and in the instructions for use.

There is a danger to life if warnings are not obeyed. Severe personal injury or damage to property may occur.

Never use defective power cables

If a damaged or unsuitable power cable is used, it could result in a fire or electric shock. Only use power cables with PE contacts approved by the manufacturer.

Disconnect the power cable correctly

When disconnecting the power cable, always do so by holding the plug. Ensure that your hands are dry. There is a risk of electric shock.

Do not insert any objects into the housing

Objects inserted into the housing may result in an electric shock or damage to the device.

Do not place any objects on top of the device

If you place objects on top of the device, this can lead to overheating and fire.

Avoid penetration of liquid

Liquids seeping into the device may result in electric shock or device failure.

⚠ **CAUTION**

Extensive damage to property may result if the device is not connected correctly

That is why you should observe the warning information:

Connection must be carried out by specialists

Please ensure that all steps are taken to avoid injuries or incorrect diagnoses.

- Only use the video cables specified by the manufacturer for the connection.
- Only use power cables with PE contacts.
- Only use power outlets with PE contacts.
- Do not connect too many devices to a power outlet or extension cable.
- Observe the information provided by the respective manufacturer.
- If required by the application or local regulations, QA software must be used for quality control and documentation.

Connection in the USA and Canada

Molded power supply plugs must comply with the requirements for "hospital grade attachments" CSA Std. C22.2 No. 21 and UL 498.

Connection in China

Only use power cables approved for China. These power cables are identified by the labels "CCC" or "CQC".

Observe the country-specific regulations

Observe all regulations of the country in which the device is used.

NOTICE

Extensive damage to property may result if the device is not connected correctly

That is why you should observe the warning information:

- Desktop installation:
  Place the device on a solid and level surface. The attached stand, as well as the installation surface, must be suitable for the weight of the device.
- For mounting on a wall or ceiling suspension:
  The mount unit must be suitable for the weight of the device.
- For installation in a rack:
  Observe the installation sequence, and provide ventilation for the device.

Provide adequate air circulation

When installing the device, ensure that there is adequate air circulation for operation. The permissible ambient temperature range must not be violated. Otherwise, the device could be destroyed by overheating.

Avoid sources of heat

Do not install the device in the vicinity of sources of heat, such as radiators, heating appliances or other devices that can generate or emit heat.

Do not subject the device to jolting or shocks

The device contains sensitive electronic components that could be damaged by jolting or shocks.

Only switch on a cold device following adaptation to room temperature

If the device is brought into a room with a higher or rising temperature, condensed water will form in and on the device. Do not switch on the device until the condensed water has evaporated. Otherwise, the device could be damaged.

NOTICE

Extensive damage to property may result if the device is not connected correctly

That is why you should observe the warning information:

Transportation only in original packaging

Use the original packaging for transportation, and transport in the correct shipping position. Be sure in particular to protect the monitor LCD modules from shocks.

Care of device / cleaning agents

- Remove water drops immediately; extended contact with water discolors the surface.
- Only clean the surfaces using the cleaning agents referred to in the Instructions for Use.
- Monitor: The screen is extremely sensitive to mechanical damage. Absolutely avoid scratches, shocks, etc.

What to do if the device is faulty

If the following conditions exist, the device must be disconnected from the line power supply and checked by qualified personnel:

- Damage to the plug or power cable.
- After liquid seeps into the device.
- If the device has been exposed to moisture.
- If the device does not function or if a fault cannot be eliminated using the Instructions for Use.
- If the device has been dropped and/or the housing damaged.
- If the device smells of burning or makes peculiar noises.

Be aware of the monitors aging

Note that monitors can fail as a result of aging, and that image properties such as brightness, contrast,and color value can change.

Do not touch the monitor screen

Due to mechanical pressure or electrostatic discharges, touching the screen can result in brief disturbances to the image.

2.2 Product-specific safety instructions

NOTICE

Medical System

Do not connect devices which are not part of the medical system.

NOTICE

Opening the device

The device must only be opened by service personnel.

- Disconnect the power supply plugs before opening the device

NOTICE

Radio interference

This is a Class B device.

The device may cause radio interference or interfere with the operation of other devices in close proximity. In this case the user is encouraged to perform appropriate measures to correct the interference.

Note

No zero error rate

LCD monitors do not have a zero error rate. For this reason, the image parameters can change over time, e.g. reduced luminance or changing/fading colors.

Note

Image quality

To maintain constant image quality, EIZO recommends cleaning the monitor on a regular basis and checking image properties in accordance with all applicable local regulations.

3 Description

3.1 Scope of delivery

The scope of delivery includes the device and various components. After unpacking, check the scope of delivery for correctness and completeness.

Note
Keep the packaging material for subsequent transport of the device.

Device

The RadiForce LS580W is a LCD Monitor for mounting in a ceiling suspension unit or wall mount.

Product	**Order No.**
RadiForce LS580W	6GF62008AB01
RadiForce LS580W JP	6GF62008AB04

Components

The following components are included in the scope of delivery:

- Power cable for Japan (only 6GF62008AB04)
- Signal cable
  - 2x DVI dual link cable, 2 m
- CD-ROM with documentation and general safety instructions.

3.2 Monitor performance features

The monitor has the following features, which permit a wide range of applications.

57.5" large screen diagonal

With a screen diagonal of 57.5" and a resolution of 3840 x 2160 pixels (8 MP), the LS580W is suitable for simultaneous use of several video sources.

Particularly when used together with the LMM56800 or LMM0802 Large Monitor Manager, the versatile monitor can be used for various applications, e.g. angiography, EP or cardiology. It can replace up to eight 1MP monitors.

LED backlight

The LS580W is equipped with a white LED backlight. This means that a long service life can be achieved even with high luminance.

Perfect picture reproduction

The TFT panel used with the LS580W enables a very large viewing angle and high luminance.

The LS580W provides a flicker-free picture, even at low refresh rates. The monitor thus meets the strictest ergonomic requirements.

Fully Automated Stability

The LS580W has a Fully Automated Stability system that keeps luminance constant in accordance with medical standards such as DICOM or Gamma 2.2, for example. The integrated stability system ensures constant luminance using a light sensor integrated in the backlight.

Increased failure safety

Great attention was applied to increased failure safety in the electronic design of the monitor. Two independent circuits are used for the backlight power supply, and a partial image is still displayed should one video channel fail.

Communication interface

As communication interface the DVI, DisplayPort or USB connection is available. The operating states of the monitor can be read and switched via the interface, e.g. in
Power Safe Mode. In particular, the monitor functionality can be queried using the interface.

Even distribution of luminance

The monitor is equipped with luminance correction electronics to achieve luminance uniformity This electronics is calibrated in the factory. Recalibration is possible.

Preset Look Up Tables

The LS580W is precalibrated at the factory. A total of five practice oriented Look Up Tables (LUTs) have been preset. This calibration data makes installation and maintenance easier. As such, the monitor can be easily adapted to the respective application and local lighting conditions.

3.3 Medical subsystem

The RadiForce LS580W can be part of a medical subsystem comprising the following components.

Mandatory Devices

- RadiForce LS580W
- Suitable Large Monitor Manager, such as LMM56800 or LMM0802 for example.

Accessories and Optional Devices

- Analog-DVI Converter PDC0100
- DVI Splitter/Scaler PDS0800
- DVI Transmission Link TDL3600
- Control Interface Device CID1201P

Detailed information on the individual parts of the medical subsystem can be obtained from the documentation of the respective components.

4 Setup and installation

⚠CAUTION

Changes to device

Do not make any mechanical or electric changes to the device. Otherwise the device warranty becomes invalid.

The manufacturer is not liable for changes made to the device.

4.1 Installation site

NOTICE

The power switch and connections must be accessible at all times

When installing and connecting the monitor, ensure that the power switch and the connections are accessible at all times.

NOTICE

Condensation

If the device is brought into a warm environment from a cold one, condensation may form in the device. This could result in a short circuit when switching on the device, damaging it.

- Wait until the condensed water has evaporated, including that inside the device, before you switch it on. This can take several hours.

NOTICE

Overheating

Ventilation holes are located on the rear of the housing.

If the ventilation holes are covered or closed, the heat generated in the monitor will not be dissipated sufficiently.

- Do not cover the ventilation holes.
- Do not close the ventilation holes.
- The minimum distance from the back and side of the monitor to the wall must be 10 cm, and at least 15 cm from other devices.
- The ambient temperature of the monitor must be in the acceptable range of +5 °C ... +40 °C.

NOTICE

Dusty environment

The monitor is intended for use in the clean environment of medical diagnostics. In dusty environments, ventilation holes in the back can allow dust to penetrate into the monitor.

In the worst case, deposits are possible which become evident as dark spots in a white picture and result in deterioration of the luminance.

- Protect the monitor from dust, for example through appropriate construction measures at the installation site.

Note

Reflections on the screen

The monitor has an anti-glare surface that is only effective if the screen is clean and grease-free.

- Comply with the specifications for cleaning.
- Position the monitor to avoid reflections on the display area.
  Reflections can be caused by lights, windows, furniture with shiny surfaces, or light-colored walls.
- In order to reduce reflections on the monitor, only use non-dazzling reflector bulbs for the ceiling lighting.

Note

Shocks and impacts

The monitor is sensitive to mechanical influences. Shocks and impacts on the panel surface can lead to total failure.

- Ensure that such mechanical influences at the installation site are avoided.

Note

Movable installation

If the monitor is installed such that it can move, make sure that persons or objects in the facility are not endangered by the monitor's range of movement.

Note

During transport, use the original packaging or service packaging.

4.2 Unpacking the monitor

⚠ **CAUTION**

Injuries due to the monitor falling or tipping over

To prevent injuries when unpacking the monitor, proceed as follows:

- Make sure the monitor cannot tip over.
- The monitor must be removed from the packaging and carried by at least two persons.
- Wear appropriate protection to prevent injuries should the monitor fall.

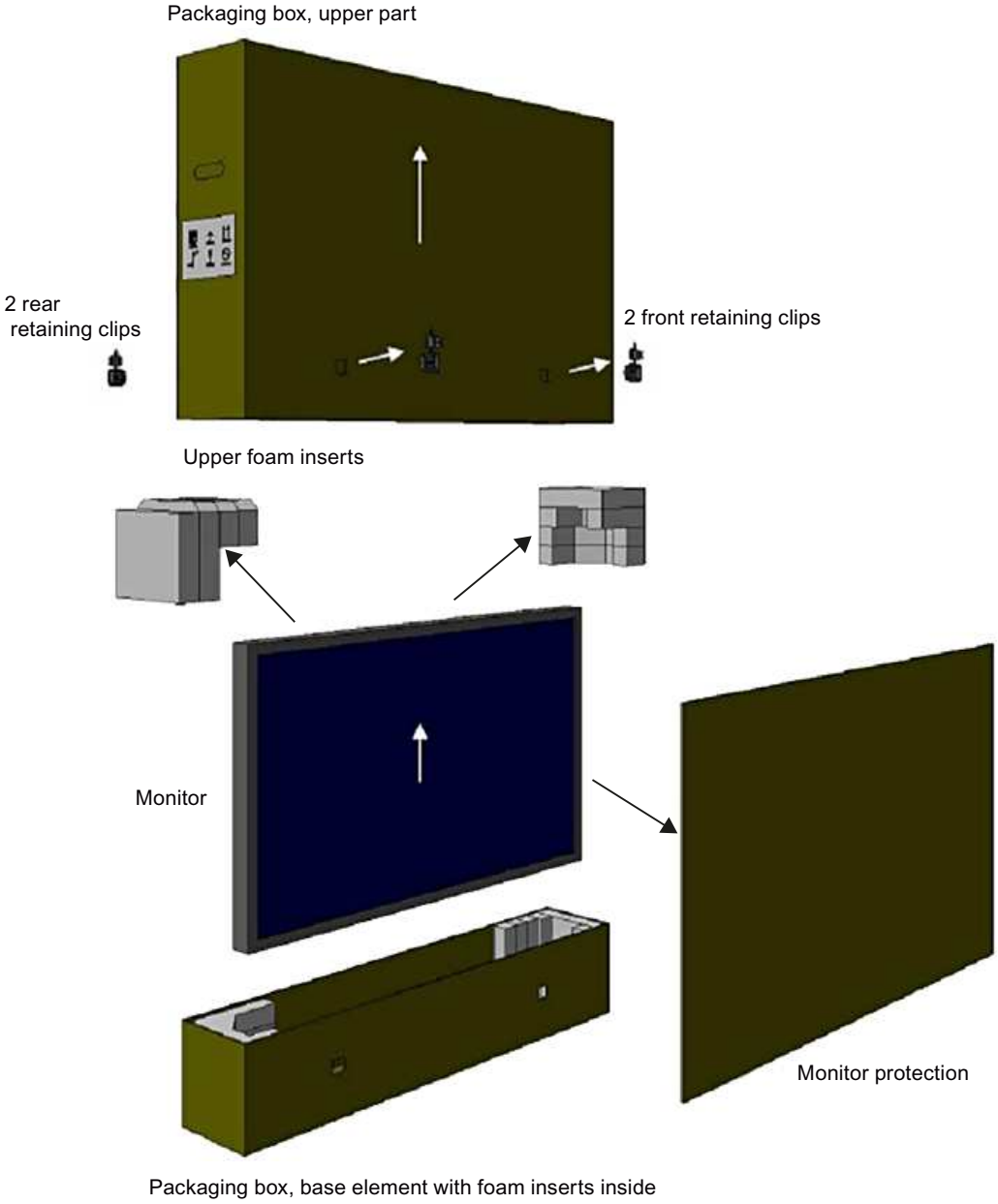


Fig. 1: Monitor packing (schematic representation)

Unpack the monitor as follows:

1. Carefully open the packaging and remove the upper section of the carton as well as all accessible packing parts.
2. Lift the monitor from the base of the packing carton. Hold it on the side and underside.

4.3 Mounting the monitor

The LS580W has a VESA 400 x 400 adapter and can be installed in a suitable ceiling suspension or wall mount.

Note the following during installation:

- The maximum torque for attaching to the holder is 10 Nm.
- The screws used for attaching to the holder must meet the following requirements:

Number	4
Thread	M8
Strength	8.8 in accordance with ISO 898-1
Insertion depth	16 - 20 mm

⚠ CAUTION

Holders

- Holders must be tested and approved by the manufacturer for the weight to be supported.
- An installed stand must be sufficiently stable such that tilting up to 10° does not result in the monitor toppling.

Note

Recommended wall mount

EIZO recommends the FWM6300 wall mount because it has been tested with the monitor and meets all necessary conditions.
Order No.: 6GF69888AB02

Note

Recommended stand

EIZO recommends the FST5600 stand because it has been tested with the monitor and meets all necessary conditions.
Order No. 6GF69888BA01

5 Connecting

5.1 Safety information for connection

All safety information and warnings for the device must be observed to ensure danger-free operation.

⚠CAUTION

Changes to device

Do not make any mechanical or electric changes to the device. Otherwise the device warranty becomes invalid.

The manufacturer is not liable for changes made to the device.

⚠CAUTION

Shielding measures

Follow all shielding measures in accordance with local EMC directives. If these guidelines are not observed, device malfunction may result.

⚠CAUTION

Grounding

The permissible leakage current is not exceeded during the first fault event in accordance with EN60601-1. The device is grounded with an additional protective conductor to ensure the greatest possible electric safety.

⚠CAUTION

Excessive currents, short circuits, and ground faults

In accordance with national standards and regulations, protection against excessive currents, short circuits, and ground faults must be incorporated into the building installation.

NOTICE

Changes to device settings

Device settings may only be adjusted by service personnel.

NOTICE

Disconnecting from line power

Always set the power switch to "Off" before disconnecting the device from power. Otherwise the device could be destroyed.

NOTICE
Cable installation Observe the following instructions: • Only shielded cables are to be used for all signal connections. • The connecting cables must not be kinked. • The minimum bending radius of a connecting cable generally equals five times the cable diameter. • Do not route signal cables and power cables next to one another. Otherwise, line power subject to heavy interference could result in reversible pixel errors. • The device must not share a line power supply with motors or valves (interference!). • Externally connected cables can represent a trip hazard. Make sure that all incoming cables are safely routed. • If the device offers strain relief mechanisms for the cables, use them to prevent unintended loosening of connected cables.

5.2 Device connectors

⚠ CAUTION

Opening the connector panel cover

Only service may open the connector panel cover. Patients must not be present when the cover is open.

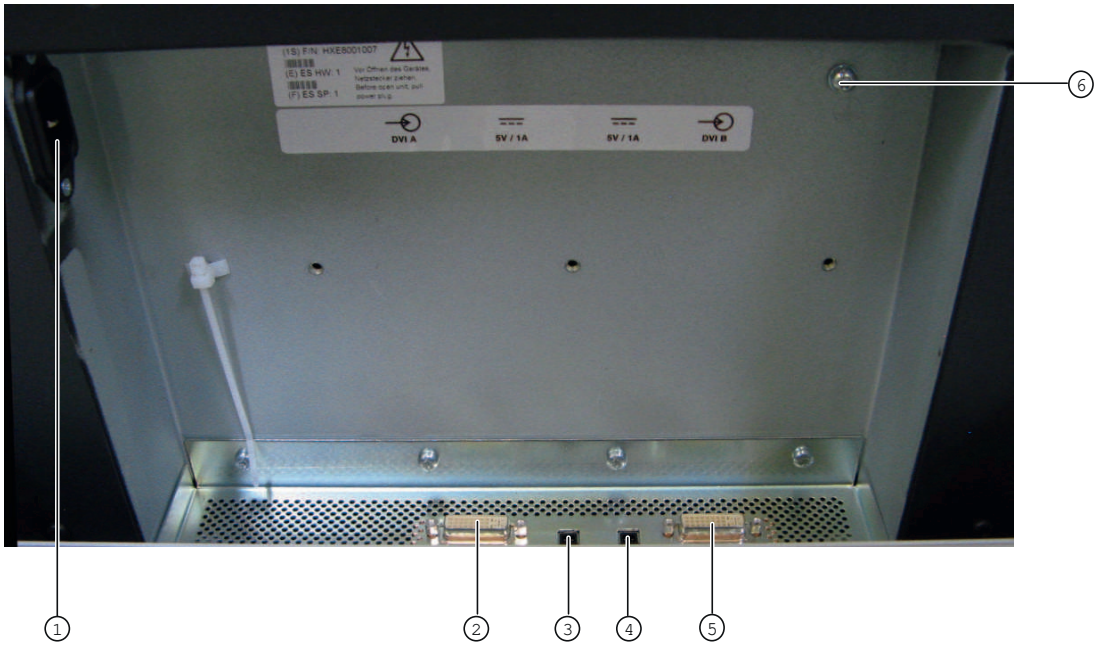


Fig.: Connection panel

① Power connector
② DVI A (front view: right half)
③ 5 V connection for external devices
④ 5 V connection for external devices
⑤ DVI B (front view: left half)
⑥ Ground screw (protective conductor connection)

Power connector

The device's power supply is connected using an appliance plug.

DVI connectors

The monitor has two dual-link DVI connectors (A and B)

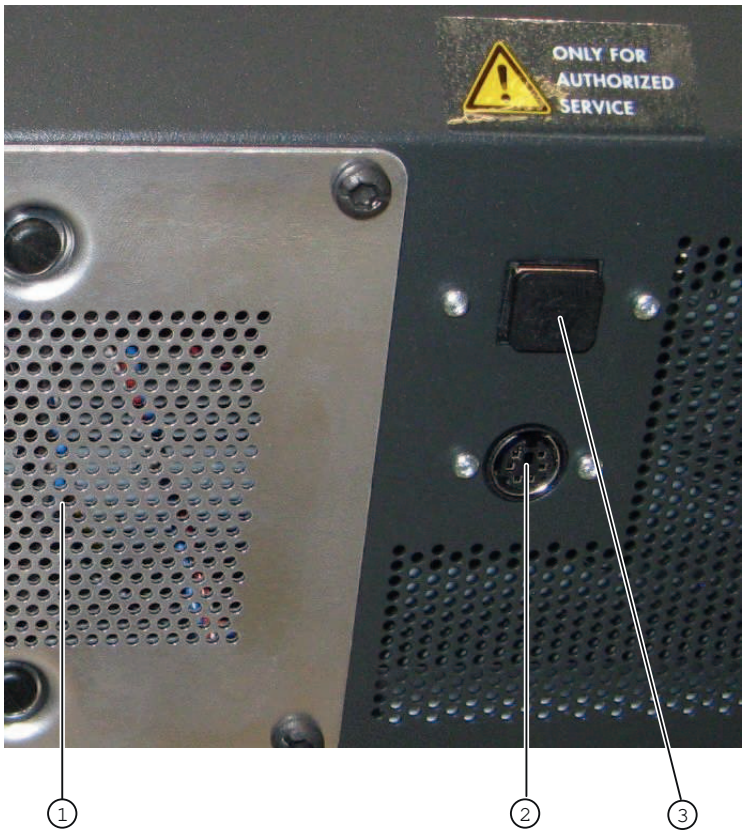
5 V connections

The monitor has two 5 V outputs which can be used to supply external devices.

Grounding screw

The additional protective conductor is connected to the grounding screw.

Connectors on underside of unit



① Center fan cover
② Serial interface
③ USB type B (with protective cap in figure)

- **USB connector:** USB type B connector is used by Service for software updates.
- **Serial interface:** Service uses the serial interface to connect a photometer.

NOTICE
Connecting a photometer • Only service can connect or disconnect a photometer. • Only photometers tested for calibrating the monitor may be connected to the serial interface. • A photometer must not be connected in the presence of the patient.

5.3 Description of connection procedure

⚠ CAUTION
Opening the connector panel cover Only service may open the connector panel cover. Patients must not be present when the cover is open.

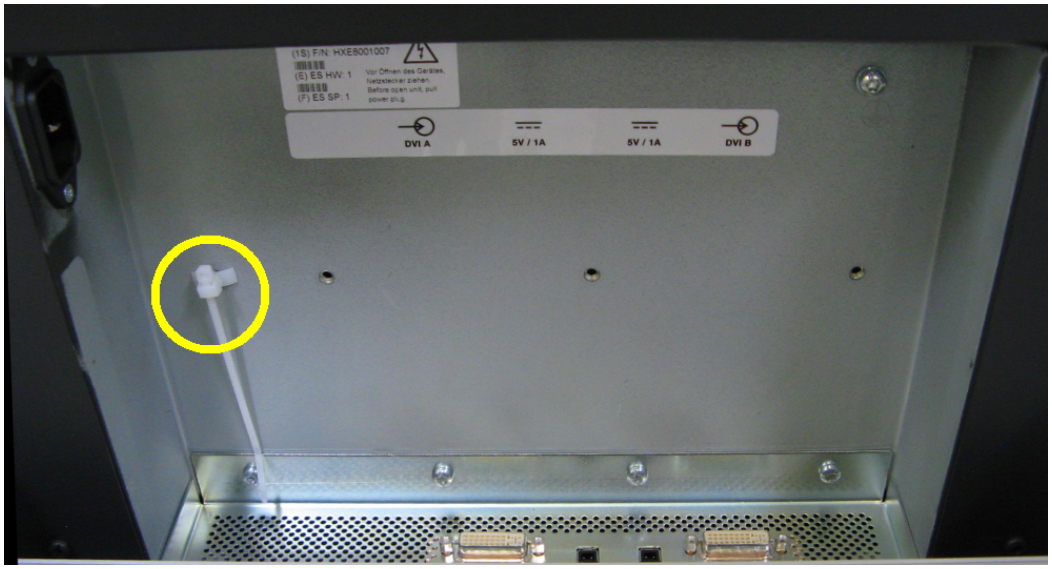
⚠ CAUTION
Connector Connectors may only be plugged in or removed by Service when the device is switched off.

Prerequisite

The monitor must be installed correctly.

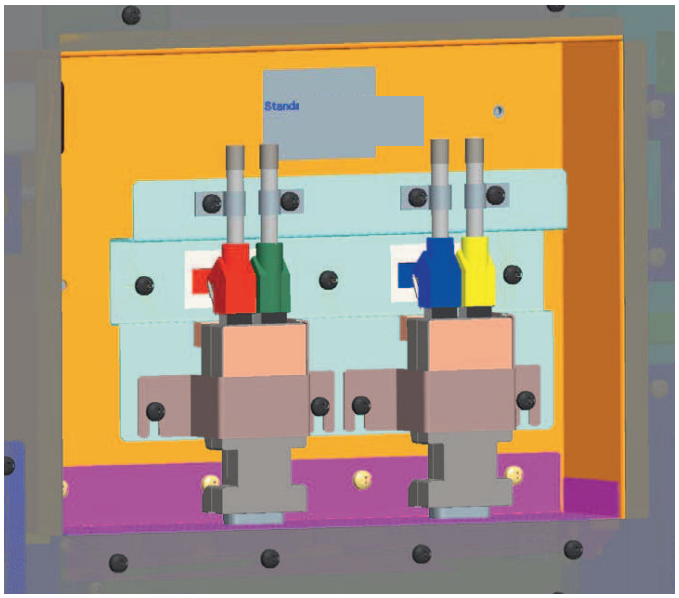
Connecting

1. Loosen the connector panel Combi-Torx screws.
2. Remove the connector panel cover.
3. Connect the appliance plug to the monitor power socket.
4. Secure appliance cable with cable ties to the lug to prevent unintentional loosening (marked with a circle).



5. Insert the DVI cable directly into the DVI socket. Only Dual Link DVI cables of a correspondingly high quality may be used.

6. If TDL3600-QL modules from EIZO are used:
   Connect the CAT cables to the DVI receiver module connectors and tighten the clamps. When connecting the cables, observe the color coding and customer-specific information.



7. Place the cover on the connector panel
8. Secure the cover with the Combi-Torx screws.

6 Commissioning

Note
Factory settings All monitors are optimally preset in the factory, such that changes are not usually required.

6.1 Switching on the monitor and video source

The monitor and connected video source can be switched on in any order.

Switching on the monitor before the video source

1. Switch on the monitor.

   The operation LED lights up yellow.

2. Switch on the video source.

   If the connected signal can be displayed on the monitor, the operation LED will light green.

Switching on the video source before the monitor

1. Switch on the video source.
2. Switch on the monitor.

   If the connected signal can be displayed on the monitor, the operation LED will light green.

⚠ CAUTION
Operation LED does not light green? If the operation LED does not light green after the equipment has been switched on and a video signal has been applied: • check the system for basic connection and operating errors before contacting service personnel.

6.2 Avoiding image sticking

Image sticking may occur with LCD monitors. Image sticking is an effect whereby a faint image of the previous screen contents can be seen after the display contents have changed.

The following measures can reduce or prevent image sticking:

- Use a screen saver with regularly changing images
- Switch off the monitor when it is no longer needed.
- The monitor has an energy saving mode:
  If the application in use supports the energy saving mode, activate it.

Note
Energy saving (Power Management) The monitor supports various energy saving settings, called Power Management (PM). When PM is active, the monitor backlight switches off automatically for example, if the monitor is without a video signal for an extended period. Also observe the operating system manufacturer's instructions regarding power management settings.

6.3 Graphics controller settings

Controlling the monitor with the Large Monitor Manager

No settings have to be made if a Large Monitor Manager is used to control the monitor. No configuration is required.

Controlling the monitor without the Large Monitor Manager

The monitor can be used as a high end PC monitor without the Large Monitor Manager. The following prerequisites must be met to be able to control the monitor without the Large Monitor Manager.

- The graphics card of the PC supports communication via DDC (Display Data Channel).
- The graphics card has two dual link outputs. Both outputs must operate in synchronized mode.
- The graphics card must support a resolution of 3840 x 2160 pixels (8 MP) in stretched mode.
- To operate the monitor at the desired resolution, a driver for the graphics card used must be installed.

If these requirements are met, the monitor is recognized by Windows as a plug-and-play monitor when it is switched on and the EDID data (Extended Display Identification Data) of the monitor is transferred to the graphics card. You can now configure the resolution based on the driver or operating system settings.

NOTICE
Installation and parameterization of the video source Please refer to the video source manufacturer’s manual for detailed information about installation and configuration of the video source.

6.4 Check for pixel defects

Pixel defects (small bright or dark dots) can occur in LCD monitors. During the manufacturing process, all monitors are checked for the permitted number of defective pixels.

Defective pixels cannot be corrected.

7 Operation

Once installed, user operation of the monitor consists of switching the power on and off.

After switching on the monitor, the operation LED is lit green continuously. If the LED lights up with another color, the monitor is not operating within normal operation.

Measures in the event of a failure

Note
Device malfunction in operation If the device is not working properly, check the system for basic connection and operating errors before contacting service personnel.

8 Cleaning and check settings

8.1 Cleaning

NOTICE
Device maintenance, cleaning and disinfecting • Make sure liquids do not seep into the device. Liquids that seep into the device may result in an electric shock or failure of the device. • The screen is extremely sensitive to mechanical influences. Absolutely avoid scratches, shocks, etc. for this reason. • Clean the screen when dirty using a microfiber cloth and, if necessary, a recommended cleaning agent. Clean the housing parts with a recommended cleaning agent. • Use only tested disinfectants. • If a cleaning agent is sprayed directly onto the screen surface, use a microfiber cloth to remove drops which run down before they reach the edge of the panel. • Remove drops of liquid from the device immediately. Contact with liquids over a longer period can cause discoloration or allow calcium deposits to form on the surface.

Recommended cleaning agents and disinfectants

Agent class	Tested cleaning agents and disinfectants	Further examples
Alcohol	Ethyl alcohol, 96% by vol. Mikrozid liquid Meliseptol Rapid Isopropyl alcohol (Isopropanol), 70 %	Hospiset cloth Mikrozid liquid
Aldehyde	Melsitt 10% by vol. Cidex, undiluted	Aldasan 2000 Kohsolin Gigasept FF
Chlorine derivatives	Terrain 0.5% by vol. 0.5 % Chlorhexidine in 70 % isopropyl alcohol	Quartamon Med
Disinfectants	Perform 3% by weight Morning Mist (1:64) Terralin Protect 2% by vol. Mikrozid Sensitive Liquid, undiluted Microbac Tissues	
Glucoprotamin	Incidin Plus 8% by vol.	
Guanidine derivatives	Lysoformin 2% by vol.	
Quaternary compounds	Incidur spray, undiluted	

Agent class	Tested cleaning agents and disinfectants	Further examples
Standard household washing-up liquid	Tempo	Fairy Ultra, Pril, Palmolive
Pyridine derivatives	Activ spray, undiluted	
Organic acids	Bio-AntiBact med	
Water	Tap water Distilled water	

Prohibited cleaning agents and disinfectants

Agent class	Tested cleaning agents and disinfectants:	Further examples
Light gasoline	Cleaning solvent, petroleum spirit close to boiling	Petroleum ether

Note

Cleaning other components

Information on cleaning or disinfection of other system components can be obtained from the respective instructions for use.

8.2 Check the settings

⚠ CAUTION

Checking the settings

- The settings may only be checked by service personnel.
- The settings must not be checked in the presence of patients.

The picture quality of the monitor changes due to aging of the LCD unit and the backlight.

- Check the monitor settings at regular intervals in accordance with the local guidelines.
- Correct the settings if necessary.

9 Troubleshooting

The LED continuously lights up green when operating normally. In the event of a fault, you can localize it as follows, based on the screen display and the operation LED.

1. Check the monitor for the possible causes listed in this table.
2. Carry out the remedial measures before contacting the service personnel.

No picture

LED	Cause	Remedy
Green	Video signal detected, but the monitor or graphics card is set up incorrectly	Check the monitor settings (e.g. LUT, brightness, no test pattern, etc.). Check and adapt the graphics card settings.
Yellow	Power Safe Mode Monitor has been switched actively to a power saving mode.	Deactivate Power Safe Mode
	No DVI signal	DVI cable is not connected
	Incorrect timing is set	Correct the timing
Red	Internal error	Inform servicing department
Dark	Switch is off	Switch on power switch
	Power cable is not inserted or incorrectly inserted.	Check the power cable
	Power cable is defective	Replace power cable

Picture displayed

LED	Cause	Remedy
Green	No error, correct operating status	-
Yellow	Lamp warm-up period: Setting is active, and the monitor is in the warm-up period.	Wait for the warm-up period to expire. The LED turns green when the lamp has reached the stabilized luminance level.
Yellow (flashing)	Monitor has reached an initial critical temperature level.	Select a lower brightness level for standard operation. Check the ventilation and improve these conditions if necessary.
	Lamp warm-up period: Setting is active, and the warm-up period has expired without the monitor having reached the stabilized luminance level.	Inform servicing department
Red	Internal error	Inform servicing department

10 Technical specifications

Note
Applicability of technical specifications All technical specifications are valid after a warm-up period of 30 minutes.

10.1 Monitor characteristics

Type	Color, TFT (MVA)
Active Area	1270 mm x 721 mm
Screen diagonal	1460 mm (57.5")
Resolution	3840 x 2160 (4K UHD)
Refresh rate	60 Hz
Pixel arrangement	24 bit (3 x 8 bit): 3 subpixels per pixel
Pixel distance	0.331 mm (H) x 0.334 mm (V)
Contrast ratio	2800:1 (minimum), 4000:1 (typical)
Horizontal viewing angle	176° typical; 160° minimum (for contrast ratio >=20)
Vertical viewing angle	176° typical; 160° minimum (for contrast ratio >=20)
Response time (gray to gray)	9.5 ms (typically)
Backlight	780 LEDs

10.2 Power supply

Power connector	C14 power cord connector with protective conductor, IEC 60320
Line voltage	AC 100 ... 240 V (± 10%)
Line frequency	50 ... 60 Hz (± 5%)
Current consumption	< 2.0 A @ 240 V, < 5.0 A @ 100 V
Maximum power consumption	400 W
Energy saving mode	< 41 W

10.3 Inputs/outputs

DVI input	Dual link DVI-I socket (analog pins are not used) 3840 x 2160 (4K UHD) at 60 Hz Service and communication over DDC of DVI socket B
DC 5V/1A (two connectors)	For connecting external devices
6-pin mini-DIN socket (serial connection)	For connecting a photometer
USB type B	Connection for software updates

10.4 Controls and connectors

Front	1 operation LED
Back	• 1 power switch Protected by a cover: • 1 power connection socket • 2 DVI, dual link • 2 5 V/max. 1 A
Underside	• 6-pin mini-DIN socket • USB type B connector

10.5 Mechanical design

Housing components	Metal
Ventilation openings	In rear panel
Degree of protection	IP20 according to EN 60529
Connector panel	On rear panel, under cover
Weight	47 kg +/- 2 kg
Dimensions (W x H x D) in mm	1319 x 776 x 146

10.6 Climatic conditions

In operation	
Temperature range	+5 °C ... +40 °C Ambient temperature
Temperature gradient	Max. 5 °C/h, no condensation
Air pressure	570 ... 1050 hPa

Transport and storage (packed)	
Temperature range	-20 °C ... +55 °C ambient temperature
Temperature gradient	Max. 5 °C/h, no condensation
Air pressure	200 ... 1050 hPa
Humidity	10 % ... 90%, non-condensing

10.7 Safety regulations

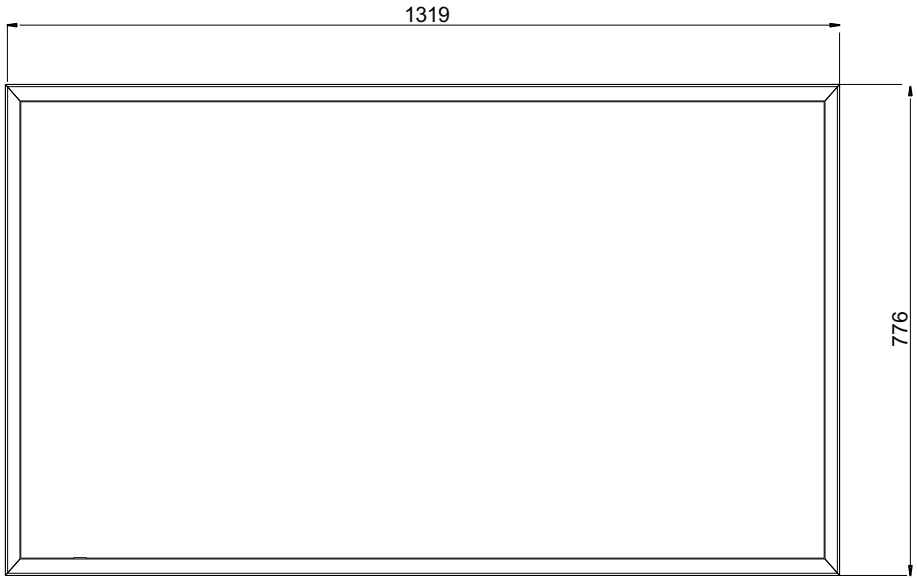
Safety regulations	
Safety standards	• IEC/EN 60601-1 • CAN/CSA - C 22.2 No. 60601 • GB4943.1 (non-tropical, altitude < 2000 m), safety specification T8AL, 250 V
Protection class	Protection class I
Degree of protection	IP20
Medical device classification (EU)	Class 1

11 Dimension drawings

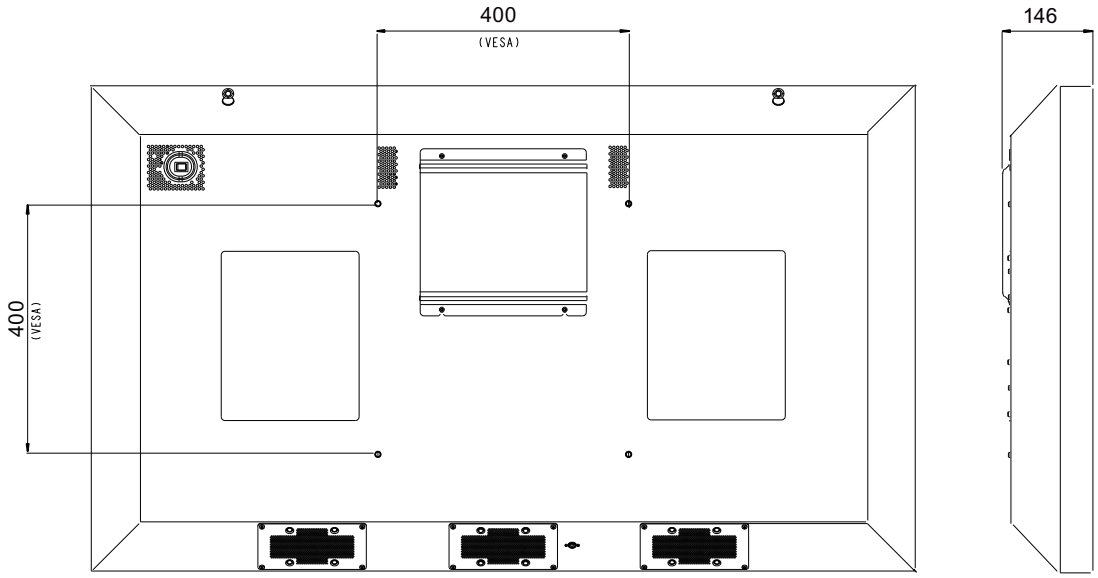
All dimensions in mm

11.1 Monitor dimensions

Front view



View from behind and to the side - with cover



12 Appendix

12.1 Markings and symbols

Marking / symbol	Meaning
⚠	Symbol for "Caution, observe accompanying documents".
CE	CE marking (EU conformity mark).
UK CA	UKCA marking (UK conformity mark).
EU Medical Device	Medical device in accordance with the European medical device regulation.
Electrical Safety MET c us E113208	MET marking, in accordance with U.S. and Canadian national regulations.
FC	U.S. FCC marking for communication devices.
CCC	CCC marking, in accordance with Chinese national regulations.
IS 13252 (Part 1)/ IEC 60950-1 R-41126039 www.bis.gov.in	BIS marking, in accordance with Indian national regulations.
	RCM marking for conformity with Australian and New Zealand EMC standards.
	Symbol for the manufacturer of medical devices, supplemented by the date of manufacture.
	WEEE marking: Product must be disposed of separately; materials may be recycled.
10	Marking according to ACPEIP (China-RoHS).
IP20	Symbol for degree of protection according to DIN EN 60529.
|	"On" symbol (voltage).
○	"Off" symbol (voltage)
	Input for service calls.
	Symbol for "Comply with the instructions for use".
	Symbol for "Dangerous voltage".
UK Responsible Person	UK Responsible Person
CH REP	Swiss authorised representative (CH-REP)

12.2 Information on electromagnetic compatibility (EMC)

EIZO monitors were designed for the display of images and normal monitor operation.

⚠WARNING

Special EMC provisions are required for use of the RadiForce LS580W. Installation, assembly, and use must take place in compliance with the following instructions.

- Only use the cables included in the scope of delivery or recommended by the manufacturer. The use of other cables can result in increased electromagnetic radiation and reduced electromagnetic interference immunity of the device, as well as improper use. Cable length: max. 3 m
- The monitor should not be placed on other devices or positioned in their immediate vicinity. If devices have to be operated on or in the immediate vicinity of one another, the monitor or system must be monitored to ensure proper operation for the defined configuration.
- When using a portable RF communications device, maintain a distance of at least 30 cm from all parts of the monitor, including cables. Otherwise, problem-free function of the device cannot be guaranteed.
- Persons connecting additional devices to the signal input or output when configuring a medical system are responsible for ensuring compliance with standard IEC/EN 60601-1-2.

Electromagnetic radiation		
The RadiForce LS580W is intended for use in the electromagnetic environments noted below. Customers and users of the RadiForce LS580W have to ensure that the device is used in such an environment.		
Radiation test	**Conformity**	**Information regarding the electromagnetic environment**
RF radiation CISPR11/EN 55011	Group 1	The RadiForce LS580W generates RF for its internal function only. For this reason, the RF radiation is very low and is therefore unlikely that it will result in interference in electronic devices in the immediate vicinity.
RF radiation CISPR11/EN 55011 GB9254	Class B	The RadiForce LS580W is approved for use in a number of environments. This includes residential areas and areas connected directly to the public low-voltage grid, such as private homes.
Harmonic currents IEC/EN 61000-3-2 GB17625.1	Class D	
Voltage fluctuations / flicker IEC/EN 61000-3-3	fulfilled	

Electromagnetic interference immunity			
The RadiForce LS580W was tested with the following compliance levels in accordance with the test requirements for professional healthcare facilities, as established in IEC/EN 60610-1-2. Customers and users of the RadiForce LS580W have to ensure that the monitor is used in such an environment.			
Interference immunity test	**Measurement level**	**Compliance level**	**Information regarding the electromagnetic environment**
Electrostatic discharge (ESD) IEC/EN 61000-4-2	±8 kV contact ±15 kV air	±8 kV contact ±15 kV air	It is recommended to use the device on wood, concrete, or ceramic floors. If the floor is made of synthetic material, the relative humidity should be at least 30%.
Fast transient electric disturbances (bursts) IEC/EN 61000-4-4	±2 kV power lines ±1 kV input / output lines	±2 kV power lines ±1 kV input / output lines	The power supply quality has to correspond to that of typical industrial environments or hospitals.
Surge voltage IEC/EN 61000-4-5	±1 kV line against line ±2 kV line against ground	±1 kV line against line ±2 kV line against ground	The power supply quality has to correspond to that of typical industrial environments or hospitals.
Voltage dips, brief interruptions, and fluctuations of power supply lines IEC/EN 61000-4-11	0 % V_T for 0.5 periods and 1 period 70 % V_T for 25 / 30 periods at 50 / 60 Hz 0 % V_T for 250 / 300 periods at 50 / 60Hz	0 % V_T for 0.5 periods and 1 period 70 % V_T for 25 periods at 50 Hz 0 % V_T for 250 periods at 50 Hz	The power supply quality has to correspond to that of typical industrial environments or hospitals. If the monitor has to continue operation even if the power supply is interrupted, it is recommended to connect the device to an uninterruptible power supply or battery.
Magnetic fields with energy technology frequencies IEC/EN 61000-4-8	30 A/m (50 / 60 Hz)	30 A/m (50 Hz)	The magnetic fields with energy technology frequencies must be in an area that is representative of a typical location in a typical industrial environment or hospitals. The device should be used at least 15 cm away from the source of magnetic fields with energy technology frequencies.
Note: V_T is the alternating current voltage before application of the measurement level.			

Electromagnetic interference immunity			
The RadiForce LS580W was tested with the following compliance levels in accordance with the test requirements for professional healthcare facilities, as established in IEC/EN 60601-1-2. Customers and users of the monitor have to ensure that the monitor is used in such an environment.			
Interference immunity test	**Measurement level**	**Compliance level**	**Information regarding the electromagnetic environment**
Line-based disturbances caused by RF fields IEC/EN 61000-4-6	3 V_{rms} 150 kHz to 80 MHz	3 V_{rms}	Portable and mobile RF communications devices may only be operated in the vicinity of the monitor and its components (including cables) when in compliance with the recommended minimum distance. It is determined using the formula for calculating the frequency of the transmitter. Recommended minimum distance d = 3.5/3 √P = 1.2 √P, 150 kHz to 80 MHz d = 2 √P, ISM bands between 150 kHz and 80 MHz d = 3.5/3 √P = 1.2 √P, 80 MHz to 800 MHz d = 7/3 √P = 2.3 √P, 800 MHz to 2.7 GHz In this case, "P" stands for the measured maximum nominal output power in watts (W) of the transmitter recommended by the transmitter manufacturer, and "d" for the recommended minimum distance in meters (m). The field strengths of fixed transmitters according to electromagnetic location measurement[a)] have to be less than the compliance level in each individual frequency range. Interference can occur when used in the vicinity of devices identified with the following symbol.
	6 V_{rms} ISM bands between 150 kHz and 80 MHz	6 V_{rms}	
Electromagnetic RF fields IEC/EN 61000-4-3	3 V/m 80 MHz to 2.7 GHz	3 V/m	
Note: The higher frequency range applies at 80 MHz and 800 MHz. **Note:** Guidelines with respect to line-based interference due to RF fields or electromagnetic RF fields may not apply in all situations. Absorption and reflection by structures, objects, and people impact the propagation of electromagnetic waves. .			
[a)] The field strengths of fixed transmitters, for example the base station for cordless and mobile telephones, radio, land mobile radio, ham radio, and television cannot be determined precisely in advance. To evaluate the electromagnetic environment using fixed transmitters, an electromagnetic location measurement should be included. If the measured field strength in the environment where the device is used exceeds the applicable RF compliance level, observe the monitor to ensure its proper operation. If improper operation is observed, in some circumstances additional measures may be necessary, such as reorienting or repositioning the device.			

Recommended minimum distance between portable or mobile RF communications devices and the RadiForce LS580W			
The RadiForce LS580W is intended for use in an electromagnetic environment in which interference due to electromagnetic radiation is controlled. For other portable and mobile RF communication devices (transmitters), the recommended minimum distance between the portable and mobile RF communication devices (transmitters) and the monitor applies as listed below. This is based on the maximum output power of the communication device.			
Maximum nominal output power of the transmitter (W)	**Recommended minimum distance according to the frequency of the transmitter (m)**		
	150 kHz to 80 MHz $d = 1.2 \sqrt{P}$	80 MHz to 800 MHz $d = 1.2 \sqrt{P}$	800 MHz to 2.7 GHz $d = 2.3 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters whose maximum nominal output power is not shown above, the recommended minimum distance "d" in meters (m) can be determined using the formula for calculating the frequency of the transmitter. "P" here stands for the transmitter's maximum measured nominal output power in watts (W), as recommended by the transmitter's manufacturer. **Note:** For 80 MHz and 800 MHz, the recommended minimum distance for the higher frequency range applies. **Note:** This information may not be applicable in all situations. Absorption and reflection by structures, objects, and people impact the propagation of electromagnetic waves.			

Recommended minimum distance between portable or mobile RF communications devices and the RadiForce LS580W

The RadiForce LS580W is intended for use in an electromagnetic environment in which interference due to electromagnetic radiation is controlled. The customer or user of the monitor can help prevent electromagnetic interference by maintaining the recommended minimum distance between portable and mobile RF communications devices (transmitters) and the monitor.
The interference immunity regarding adjacent fields has been confirmed for the following wireless RF communications devices:

Test frequency (MHz)	Bandwidth[a)] (MHz)	Service[a)]	Modulation[b)]	Maximum power (W)	Minimum distance (m)	Measurement level (V/m)	Compliance level (V/m)
385	380 - 390	TETRA 400	Pulse modulation[b)] 18 Hz	1.8	0.3	27	27
450	430 - 470	GMRS 460 FRS 460	FM ±5 kHz deviation 1 kHz sine	2	0.3	28	28
710	704 - 787	LTE band 13, 17	Pulse modulation[b)] 217 Hz	0.2	0.3	9	9
745							
780							
810	800 - 960	GSM 800/900 TETRA 800 iDEN 820 CDMA 850 LTE band 5	Pulse modulation[b)] 18 Hz	2	0.3	28	28
870							
930							
1720	1700 - 1990	GSM 1800; CDMA 1900 GSM 1900 DECT LTE band 1, 3, 4, 25 UMTS	Pulse modulation[b)] 217 Hz	2	0.3	28	28
1845							
1970							
2450	2400 - 2570	Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE band 7	Pulse modulation[b)] 217 Hz	2	0.3	28	28
5240	5100 - 5800	WLAN 802.11 a/n	Pulse modulation[b)] 217 Hz	0.2	0.3	9	9
5500							
5785							

[a)] For some radio services, only the frequencies for the radio contact from the mobile communications device to the base station ("Uplink") is included in the table.
[b)] The carrier is modulated by a square wave with 50 % duty cycle.

12.3 FCC Declaration of Conformity

For U.S.A. , Canada, etc. (rated 100-120 Vac) Only

FCC Declaration of Conformity

We, the Responsible Party

EIZO Inc.

5710 Warland Drive, Cypress, CA 90630

Phone: +1 (562) 4 31 50 11

declare that the product

- Trade name: EIZO
- Model: RadiForce LS580W

is in conformity with Part 15 of the FCC Rules. Operation of this product is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note

Use the specified cable below or EIZO signal cable with this monitor so as to keep interference within the limits of a Class B digital device.

- AC Cord
- Shielded Signal Cable

Canadian Notice

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est comforme à la norme NMB-003 du Canada.

12.4 China RoHS (Restriction of Hazardous Substances)

液晶显示器 LCD Monitor
型号 Model: 6GF62008A$## ($ = A...Z; ## = 00…99)

根据SJ/T11364-2014《电子电气产品有害物质限制使用标识要求》特提供如下有关污染控制方面的信息。
The following product pollution control information is provided according to SJ/T11364-2014 Marking for the restriction of the use of hazardous substances in electrical and electronic product.

电子电气产品有害物质限制使用标志说明
Explanation of Marking for Restriction of Hazardous Substances

该标志表明本产品含有超过中国标准GB/T26572-2011《电子电气产品中限用物质的限量要求》中限量的有毒有害物质。标志中的数字为本产品的环保使用期，表明本产品在正常使用的条件下，有毒有害物质不会发生外泄或突变，用户使用本产品不会对环境造成严重污染或对其人身、财产造成严重损害的期限。单位为年。

为保证所申明的环保使用期限，应按产品手册中所规定的环境条件和方法进行正常使用，并严格遵守产品维修手册中规定的定期维修和保养要求。

产品中的消耗件和某些零部件可能有其单独的环保使用期限标志，并且其环保使用期限有可能比整个产品本身的环保使用期限短。应到期按产品维修程序更换那些消耗件和零部件，以保证所申明的整个产品的环保使用期限。

本产品在使用寿命结束时不可作为普通生活垃圾处理，应被单独收集妥善处理。

This symbol indicates the product contains hazardous materials in excess of the limits established by the Chinese standard GB/T26572-2011 Requirements of concentration limits for certain restricted substances in electrical and electronic products. The number in the symbol is the Environment-friendly Use Period (EFUP), which indicates the period during which the toxic or hazardous substances or elements contained in electronic information products will not leak or mutate under normal operating conditions so that the use of such electronic information products will not result in any severe environmental pollution, any bodily injury or damage to any assets. The unit of the period is "Year".

In order to maintain the declared EFUP, the product shall be operated normally according to the instructions and environmental conditions as defined in the product manual, and periodic maintenance schedules specified in Product Maintenance Procedures shall be followed strictly.

Consumables or certain parts may have their own label with an EFUP value less than the product. Periodic replacement of those consumables or parts to maintain the declared EFUP shall be done in accordance with the Product Maintenance Procedures.

This product must not be disposed of as unsorted municipal waste, and must be collected separately and handled properly after decommissioning.

有毒有害物质或元素的名称及含量 Name and Concentration of Hazardous Substances

部件名称 Component Name	有毒有害物质或元素 Hazardous substances' name					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
液晶纯平屏幕 LCD Flat Screen	O	O	O	O	O	O
控制板 Controller Board	O	O	O	O	O	O
电源 Power Supply	X	O	O	O	O	O
其他 电路板 Other Circuit Boards	O	O	O	O	O	O
其他（电缆等） Others (cables, etc.)	O	O	O	O	O	O
机架、底盘 Housing, Chassis	O	O	O	O	O	O
附件（信号电缆、输电线等） Accessories (signal cable, power line, etc.)	O	O	O	O	O	O

本表格依据SJ/T 11364 的规定编制。
O: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572 标准规定的限量要求以下
X: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572 标准规定的限量要求

- 此表所列数据为发布时所能获得的最佳信息.
- 由于缺少经济上或技术上合理可行的替代物质或方案，此医疗设备运用以上一些有害物质来实现设备的预期临床功能，或给人员或环境提供更好的保护效果。

This list is based on SJ/T 11364.
O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.
X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572.

- Data listed in the table represents the best information available at the time of publication.
- Applications of hazardous substances in this medical device are required to achieve its intended clinical uses, and/or to provide better protection to human beings and/or to environment, due to lack of reasonably (economically or technically) available substitutes.

产品中有毒有害物质或元素的名称及含量 Table of hazardous substances' name and concentration.

12.5 Declaration of compliance with India RoHS

We, EIZO Corporation, hereby declare and guarantee that this product has been designed and manufactured in compliance with the E-Waste management rule 2016 which prohibit the inclusion of the following substances except for the exemptions listed in schedule II.

- Lead, Mercury, Hexavalent Chromium, Polybrominated Biphenyls or Polybrominated Diphenyl Ethers exceeding a concentration of 0.1% by weight in homogeneous materials
- Cadmium exceeding a concentration of 0.01% by weight in homogeneous materials

For information on proper disposal and recycling of the product, please refer to the following website.
eizo.co.in/e-waste.php

12.6 Environmental protection

Comply with all local requirements and laws pertaining to the disposal of devices.

The device is in compliance with directive 2011/65/EU for limiting the use of specific hazardous materials in electric and electronic devices.

12.7 Warranty

Opening of the housing, or electrical or mechanical changes on or in the device, result in cancellation of the warranty. For warranty details, please contact the sales partner from whom you purchased the product. These warranty conditions are neither extended nor limited by the contents of this instruction manual.

12.8 Additional devices

Connected devices must meet the relevant safety standards.

12.9 Repairs

Please contact the sales partner from whom you purchased the product.

12.10 Contact

Support during installation and for technical questions

www.eizo-or.com

12.11 Trademarks

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All other company names, product names, and logos are trademarks or registered trademarks of their respective owners.

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