

# Instruction for Use

## RadiForce® LX600W

8MP 60.1" LCD Monitor

### **Important**

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



## 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.

 <b>DANGER</b>
indicates that death or severe personal injury will result if proper precautions are not taken.
 <b>WARNING</b>
indicates that death or severe personal injury may result if proper precautions are not taken.
 <b>CAUTION</b>
indicates that minor personal injury can result if proper precautions are not taken.
<b>NOTICE</b>
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.

### Proper use of EIZO products

Note the following:

 <b>WARNING</b>
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® LX600W. 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.

<b>Note</b>
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These instructions are available on the supplied CD-ROM and on the website <a href="http://www.eizo.com">www.eizo.com</a> .
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## 1.2 Correct usage

The RadiForce® LX600W has been specifically designed for medical imaging, with the exception of mammography. The monitor should be mounted in a ceiling suspension unit or wall mount.

The RadiForce® LX600W is intended to be used by health care professionals to display the video sources from various commercially-available devices (with the exception of mammography) commonly used in a medical environment on a single video monitor.

This modality application requires monitors with internal factory preset Look Up Tables in order to adapt the monitors to the human visual system. These monitors do not have to be calibrated on site.

The LX600W has five internal factory preset Look Up Tables.

The LX600W is particularly suitable for operation with the LMM56800 or LMM0802 Large Monitor Manager.

## 1.3 User

### User

In the following, health personnel such as radiologists or MTAs are referred to as the "user".

### Service/service personnel

The terms "service" or "service personnel" denote specially trained and authorized personnel, e.g. hospital technicians, medical device manufacturers.

## 2 Safety instructions

Ensure that all necessary steps are taken to avoid injuries or incorrect diagnoses.

### **No zero error rate**

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

<b>Note</b>
<b>Image quality</b> 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.

### 2.1 General safety notes

Correct transport, professional storage, installation and connection, as well as careful operation and maintenance, are required to ensure that the EIZO devices operate safely and correctly.

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

For safety reasons, the following precautions must be observed:

 **DANGER**

**Please observe all warning information present on the device and in the Instruction Manual.**

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 conductor. This is the only way to ensure that the touch leakage current in a first fault event does not exceed 500  $\mu$ A.

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 or signal output unit
- Use of a safety isolating transformer
- Use of the additional protective conductor terminal

Mounting of the monitor: The monitor's suspension arm must have its own protective conductor. This protective conductor, together with the protective conductor of the monitor, ensures that the housing leakage current always remains less than 500  $\mu$ A, even in the event of a first fault event.

**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 line power, components in the device are subject to high voltages. Touching the components may be fatal.

**No contact between device and patients**

The device is not suitable for direct contact with patients. 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 Instruction Manual.**

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 enclosure**

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 penetrating into the device may result in an electric shock or failure of the device.

 **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 installed stand as well as the mounting surface have to be suitable for the weight of the unit.
- **For mounting on a wall or ceiling suspension:**  
The mount unit must be suitable for the weight of the device.
- **For installation in a mounting frame:**  
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 display in the vicinity of sources of heat, e.g. radiators, heating appliances or other devices which 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 acclimation 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 particularly to protect the monitor LCD module from shocks.

**Care of display / 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 Instruction Manual.
- 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 line power and checked by qualified personnel:

- Damage to the plug or power cable.
- Following the entry of liquid into the device.
- If the device has been exposed to moisture.
- If the device does not function or if a fault cannot be corrected using the instruction manual.
- If the device has been dropped and/or the housing damaged.
- If the device smells of burning or produces peculiar noises.

**Be aware of the aging of monitors**

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 discharging, touching the screen can result in brief disturbances to the image.

## 2.2 Product-specific safety instructions

<b>NOTICE</b>
<b>Medical System</b> Do not connect devices which are not part of the medical system.
<b>NOTICE</b>
<b>Opening the device</b> The device must only be opened by trained service personnel. <ul style="list-style-type: none"><li>• Disconnect the power supply plugs before opening the device</li></ul>
<b>NOTICE</b>
<b>Radio interference</b> This is a class A 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.

## 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® LX600W is a 8MP 60.1" LCD Monitor for mounting in a ceiling suspension unit or wall mount.

The RadiForce® LX600WP has protective glass. All other features are identical with those of the LX600W.

Product	Order No.
RadiForce® LX600W	6GF6200-8LA01
RadiForce® LX600WP	6GF6200-8LA11

#### Components

The following components are included in the scope of delivery:

- Power cord (country-specific versions may deviate)
  - Power cord for Europe
  - Power cord for US
  - Power cord for Japan
- 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.

#### 60.1" Large screen diagonal

With a screen diagonal of 60.1" and a resolution of 3840 x 2160 pixels (8 MP), the monitor is suitable for simultaneous use of several video sources.

Particularly when used together with the LMM56800 Large Monitor Manager or LMM0802, 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 LX600W is equipped with a white LED backlight. This means that a long service life can be achieved even with high luminance.

### **Perfect picture reproduction thanks to LCD technology**

Distortions in the image geometry do not occur with LCD technology.

The LX600W provides a flicker-free picture even with low refresh rates. The monitor thus fulfills even the strictest ergonomic requirements.

The monitor has a TFT monitor module with a very wide viewing angle. The use of state-of-the-art LCD technology allows a high luminance.

### **Fully Automated Stability**

The LX600W has an integrated stability system (ISS). The ISS ensures constant luminance using a built-in light sensor in the center of 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**

The communication interface is routed via the DVI or USB connection. 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 LX600W is precalibrated at the factory. A total of five reality-based Look Up Tables (LUTs) have been defined. The LUTs simplify installation and maintenance, and the monitor can be adapted to the local lighting conditions with a click of the mouse. Graphics settings are also retained, for example after changing the graphics card or PC, and the monitor does not have to be calibrated.

### **Protective glass**

The RadiForce® LX600WP has anti-glare protective glass fitted in front of the LCD panel to protect the surface from bumps and scratches. The monitor with protective glass is protected at the front against moisture (IP65 degree of protection). The space between the protective pane and the panel is sealed to prevent dust from entering, thus helping ensure the internal surfaces remain clean.

### **3.3 Medical subsystem**

<b>NOTICE</b>
<b>Only trained and qualified personnel</b>
The device may only be used by trained and qualified personnel.

The RadiForce LX600W can be part of a medical subsystem comprising the following components.

#### **Mandatory Devices**

- RadiForce LX600W
- Suitable Large Monitor Manager such as LMM56800 for example or LMM0802.

#### **Accessories and Optional Devices**

- Analog-DVI Converter PDC0100
- DVI Splitter/Scaler PDS0800
- DVI Transmission Link TDL3600
- Control Interface Device CID1000P

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.

EIZO GmbH will not be held liable if changes are made to the device.

### 4.1 Installation site

Note the following conditions at the installation location.

#### 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.

#### Sufficient ventilation

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.

#### Avoid dusty environments

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 building measures at the installation location.
- During transport, use the original packaging or service packaging.

### Maintain the permissible ambient temperature

The ambient temperature must be in a range of +5 °C ... +40 °C.

### Avoid reflections on the screen

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

- Comply with the specifications for Cleaning [► 30].
- Position the monitor to avoid reflections appearing on the screen.  
The 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.

### Avoid shocks and impacts

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

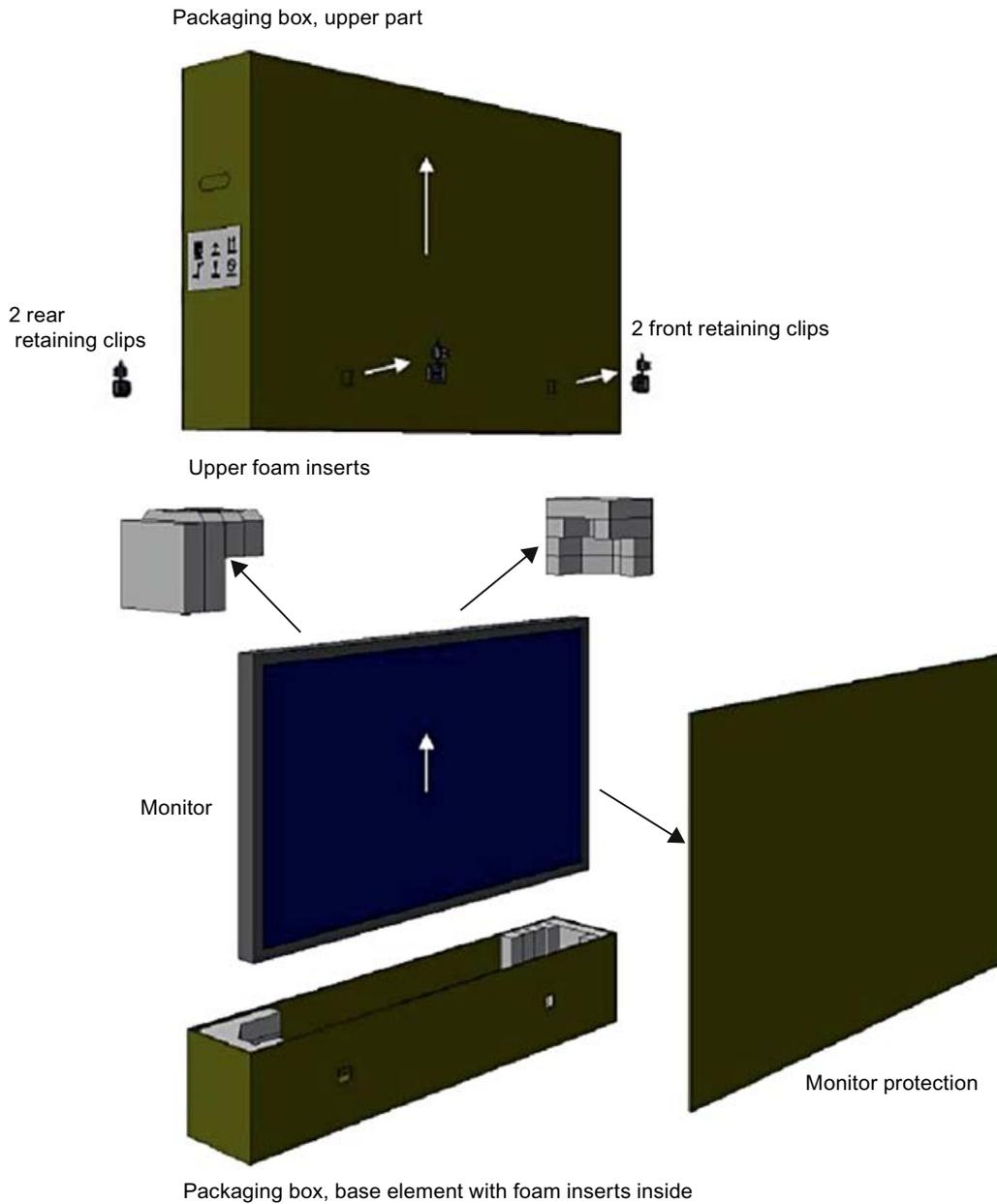
- Avoid such mechanical influences at all costs.

### 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.

## 4.2 Unpacking the monitor

 <b>CAUTION</b>
<b>Injuries due to the monitor falling or tipping over</b>
To prevent injuries when unpacking the monitor, proceed as follows:
<ul style="list-style-type: none"><li>• Make sure the monitor cannot tip over.</li><li>• The monitor must be removed from the packaging and carried by at least two persons.</li><li>• Wear appropriate protection to prevent injuries should the monitor fall.</li></ul>



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 monitor has a VESA 400 x 400 adapter and can be installed in a suitable ceiling suspension or wall mount. The maximum torque is 15 Nm.

Note the following during installation :

- The screws used for fixing to the suspension unit or mount must meet the following requirements:

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

- 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.

<b>Note</b>
<b>Wall mount</b> EIZO recommends the FWM6300wall mount, because it has been tested with the monitor and meets all necessary conditions.

## 5 Connecting

### 5.1 Safety information for connection

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

 <b>CAUTION</b>
<b>Changes to device</b> Do not make any mechanical or electric changes to the device. EIZO GmbH will not be held liable if changes are made to the device.

 <b>CAUTION</b>
<b>Shielding measures</b> Follow all shielding measures according to the country-specific EMC Directive. If these guidelines are not observed, device malfunction may result.

 <b>CAUTION</b>
<b>Grounding measures</b> To ensure that the permissible leakage current is not exceeded in the case of a fault, you must ground the device with a separate ground line.

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

<b>NOTICE</b>
<b>Changes to device settings</b> Device settings may only be adjusted by trained service personnel. Otherwise, the warranty is void.

<b>NOTICE</b>
<b>Disconnecting from line power</b> Always set the power switch to "Off" before disconnecting the device from power. Otherwise the device could be destroyed.

**NOTICE**

**Cable installation**

Please note the following:

- Only shielded cables are to be used for all signal connections.
- If the relevant facility is available on the connector, all plug connections must be screwed tight or locked.
- Do not route signal cables and power cords next to one another. Otherwise, line power subject to heavy interference could result in reversible pixel errors.
- The device must not share a 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 includes cable grips, please use them to prevent unintended loosening of connected cables.

**See also**

Safety instructions [▶ 6]

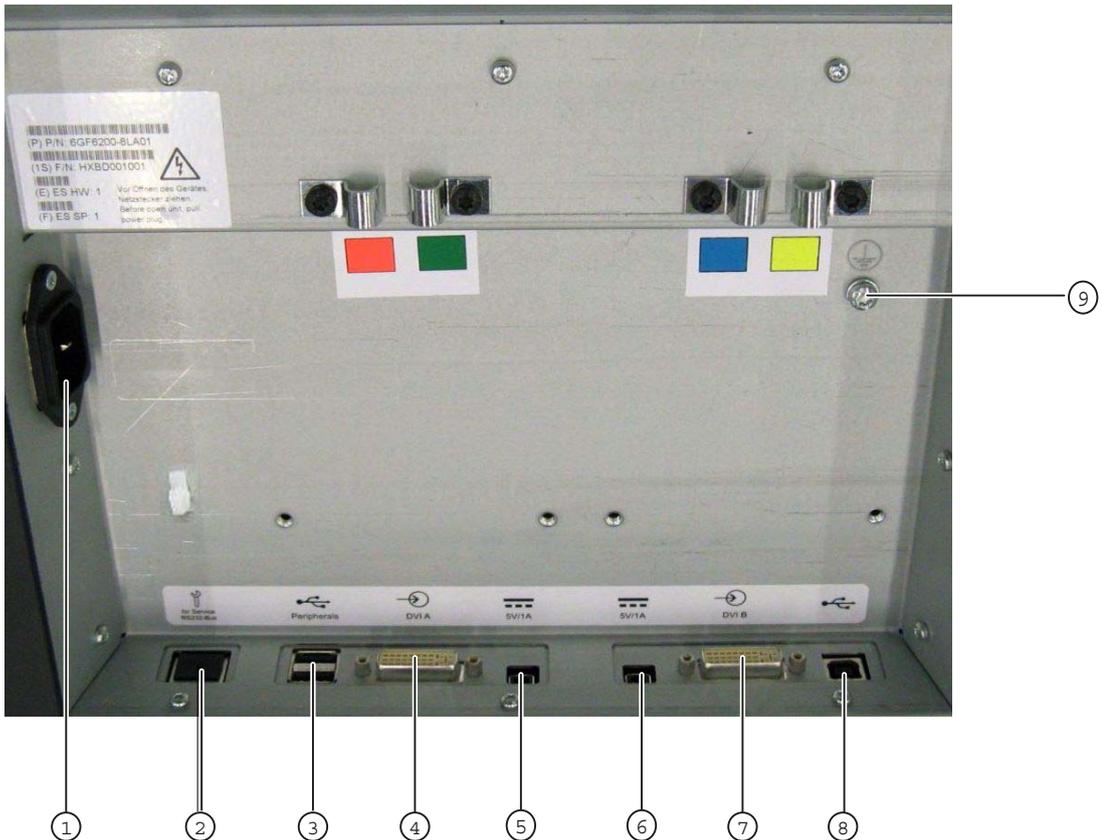
Electromagnetic compatibility [▶ 37]

## 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.



- ① Power connector
- ② Service connection
- ③ 2 x USB (downstream)
- ④ DVI A (front view: right half)
- ⑤ 5 V supply for external devices
- ⑥ 5 V supply for external devices
- ⑦ DVI B (front view: left half)
- ⑧ USB (upstream)
- ⑨ Additional grounding screw

#### 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 ground is connected to the grounding screw.

### **USB connections**

A PC can be connected to the USB upstream connection. The USB downstream connections enable communication with external devices.

### **Service connection**

The service connection is used by Service for software updates.

### **Serial interface for photometer**

The serial interface is freely accessible under the right fan.

<b>NOTICE</b>
<b>Connecting a photometer</b>
<ul style="list-style-type: none"><li>• Only service can connect or disconnect a photometer.</li><li>• Only photometers tested for calibrating the monitor may be connected to the serial interface.</li><li>• A photometer must not be connected in the presence of the patient.</li></ul>



### **See also**

Power connector [▶ 23]

DVI connector [▶ 24]

### 5.2.1 Power connector

The device power connector is located within the connector panel under a cover on the rear of the device. The power supply is connected using an appliance plug.

Please note the following.

 <b>CAUTION</b>
<b>Connecting to line power</b> The device is designed for line power with a grounded neutral conductor. <ul style="list-style-type: none"><li>• To avoid risk of electric shock, this device must only be connected to line power with a protective conductor</li><li>• Contact the responsible building technician or a qualified electrician if you are uncertain whether the line power is equipped with a protective conductor.</li></ul>

 <b>CAUTION</b>
<b>Risk of damage to the device</b> <ul style="list-style-type: none"><li>• Only use the power cord supplied with the device , or a connection cable with a protective conductor and an appliance plug in accordance with DIN 49 49547, IEC 60320 (max. length 3 m, cable e.g. H05VV-F 3x1.0 mm<sup>2</sup>). The cable must comply with the safety regulations of the respective country.</li><li>• Device fuses may only be replaced by authorized repair centers. The failure of a device fuse may result in a defect in the device. Do not use any other fuse.</li></ul>

<b>Note</b>
<b>Installations in the USA and Canada</b> Molded power supply plugs must comply with the requirements for "hospital grade attachments" CSA Std. C22.2 No. 21 and UL 498.

<b>Note</b>
<b>Installations in China</b> Power cables, power supply plugs and appliance plugs must be CCC-certified.

<b>NOTICE</b>
<b>Line voltage and frequency</b> Before connecting the device, make sure the line voltage and frequency correspond to the specifications on the name plate.

#### See also

Device connectors [▶ 21]

### 5.2.2 DVI connector

<b>NOTICE</b>
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<b>Video source settings</b>
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The monitor sends the correct settings to the video source via the DDC interface. If you change the settings, the images will not be displayed correctly.
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<b>NOTICE</b>
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<b>Do not kink the cables</b>
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The cables must not be kinked. The minimum bending radius of the cable is 30 mm.
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The monitor can process digital DVI input signals. There are two dual-link DVI connectors (A and B) for this purpose.

- Only use the Dual Link DVI cables specified by EIZO or the transmission links available from EIZO.  
The picture quality, noise immunity, and radiated interference of the entire system depend on the cable quality and length.
- You must use a device tested in accordance with IEC 60601-1 or IEC 60950-1 to control the monitor.

### 5.3 Description of connection procedure

 <b>CAUTION</b>
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<b>Opening the connector panel cover</b>
--

Only service may open the connector panel cover. Patients must not be present when the cover is open.
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 <b>CAUTION</b>
--

<b>Connector</b>
------------------

Connectors may only be plugged in or removed by Service when the device is switched off.
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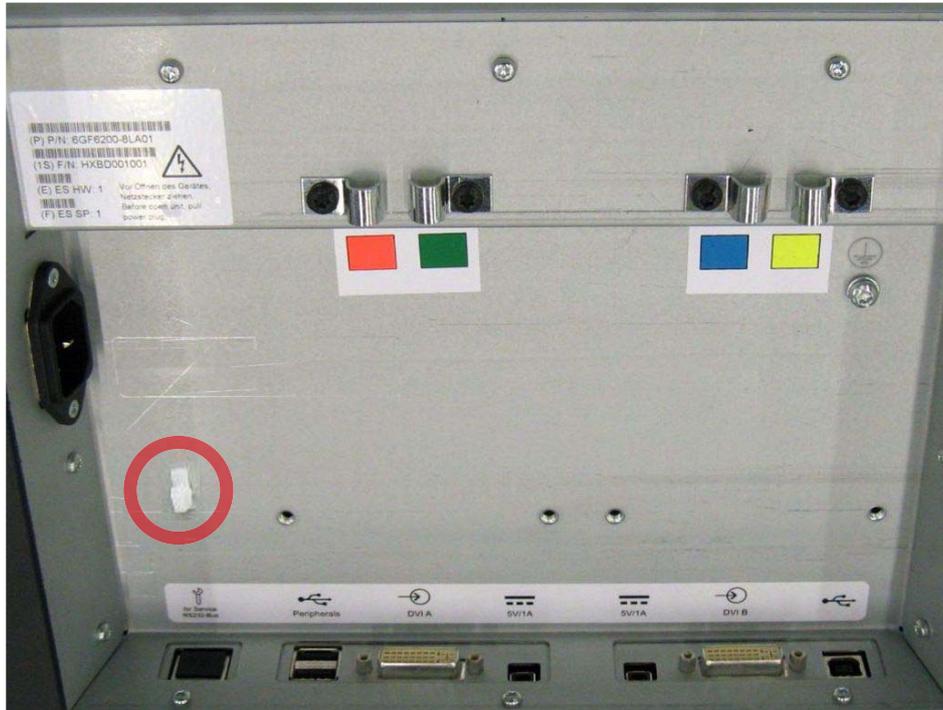
#### Requirement

The monitor must be installed correctly.

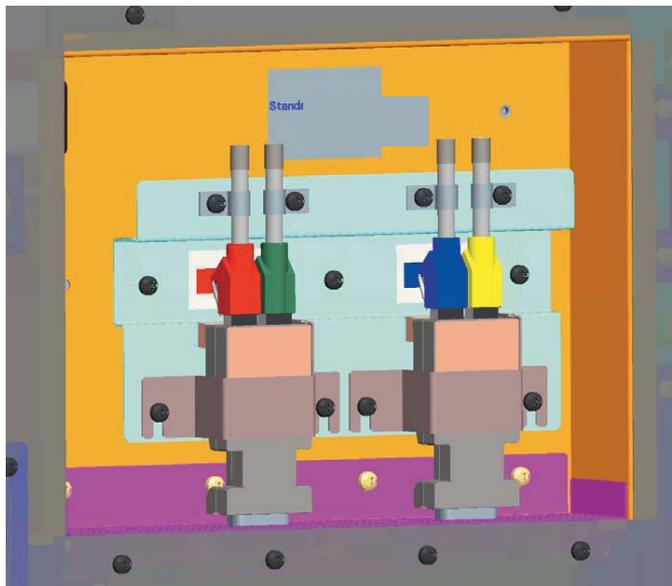
#### Connecting

1. Loosen combo Torx-slotted screw on the connector panel.
2. Remove the cover from the connector panel.
3. Connect the appliance plug to the monitor's power connector.
4. Secure appliance cable with tie to the provided lug to prevent unintentional loosening (marked with a red circle).

5. Connect DVI cables directly to the DVI sockets. Only Dual Link DVI cables with a correspondingly high quality may be used.



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



7. Replace the cover on the connector panel.
8. Fasten the cover using the combo Torx-slotted screw.

## 6 Commissioning

<b>Note</b>
<b>Factory settings</b> All monitors are optimally preset in the factory, meaning that changes are not usually required.

### 6.1 Switching on the monitor and PC

The monitor and PC can be switched on in any order.

#### Requirement

- The PC and monitor are connected to one another via DVI-I cable.
- TO obtain the best possible results, graphics cards and drivers should support communication via the Display Data Channel (DDC).

#### Switch on monitor before PC

1. Switch on the monitor.

The operation LED lights up yellow.

2. Switch on the PC.

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

#### Switch on PC before the monitor

1. Switch on the PC.

2. Switch on the monitor.

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

<b>Note</b>
<b>Operation LED does not light green?</b> 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 Avoidance of 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**

**Power management settings**

Observe the instructions of the operating system manufacturer regarding the power management settings.

The monitor supports the DVI DMPM mode (Digital Monitor Power Management), which can be used to save energy. By means of DVI DMPM, the monitor can be switched off automatically, e.g. after 20 minutes.

**See also**

Troubleshooting [▶ 33]

## 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 monitor will operate with any PC sporting a dual link, dual head graphics board that supports The graphics card must support a resolution of 3840 x 2160 pixels (8 MP) in stretched mode. Both outputs must operate in synchronized mode.

The following requirements 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).
- 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.

**Note**

**Installation and parameterization of the graphics card**

Please refer to the graphics controller manufacturer's manual for detailed information about installation and configuration of the graphics controller.

## **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, operating the monitor consists mainly 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 parameters.

### Measures in the event of a failure

<b>Note</b>
<b>Device malfunction in operation</b> If the device is not working properly, check the system for incorrect connection or operation before contacting Service.

## 8 Cleaning and maintenance

### 8.1 Cleaning

<b>NOTICE</b>
<p><b>Device maintenance, cleaning and disinfecting</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• The screen is extremely sensitive to mechanical influences. Absolutely avoid scratches, shocks, etc. for this reason.</li> <li>• 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.</li> <li>• Use only tested disinfectants.</li> <li>• 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.</li> <li>• 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.</li> </ul>

<b>Note</b>
<p><b>Monitor with protective glass</b></p> <p>If the monitor has a protective glass the glass is subject to the same cleaning and disinfection instructions as the screen. The recommended cleaning agents and disinfectants are the same.</p>

#### Recommended cleaning agents and disinfectants

Agent class	Tested cleaning and disinfection agents:	Further examples
Alcohol	Ethyl alcohol, 96% by vol. Mikrozyd liquid Meliseptol Rapid	Hospiset cloth Mikrozyd liquid
Aldehyde	Melsitt 10% by vol. Cidex, undiluted	Aldasan 2000 Kohsolin Gigasept FF
Chlorine derivatives	Terrain 0.5% by vol.	Quartamon Med
Disinfecting agents	Perform 3% by weight Morning Mist (1:64) Terralin Protect 2% by vol. Mikrozyd Sensitive Liquid, undiluted Microbac Tissues	

Agent class	Tested cleaning and disinfection agents:	Further examples
Glucoprotamin	Incidin Plus 8% by vol.	
Guanidine derivatives	Lysoformin 2% by vol.	
Quaternary compounds	Incidur spray, undiluted	
Standard household washing-up liquid	Tempo	Fairy Ultra, Pril, Palmolive
Petroleum spirit	Petroleum ether	
Pyridine derivatives	Activ spray, undiluted	
Water	Tap water Distilled water	

**Note**

**Cleaning other components**

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

## 8.2 Maintenance

 **CAUTION**

**Maintenance**

The monitor must not be serviced in the presence of patients.

### Check the settings on a regular basis

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

- Check the monitor settings against the country-specific guidelines at regular intervals.
- Correct the settings if necessary.

### Carrying out quality tests

All quality tests can be performed using the EIZO RadiCS program.

### Checking, changing, and calibrating settings

You can check and change the monitor settings and calibrate them if necessary using a photometer and suitable software.

### Confirming the image quality visually after calibrating the monitor

After calibration, the monitor must be visually inspected to verify successful and correct completion of the calibration procedure. The following two test patterns, for example, are suitable:

*8.2 Maintenance*

- SMPTE pattern: The gray levels must be displayed correctly and visibly at both 5% and 95%.
- VeriLum pattern: The visible display of small squares in all gray scale levels confirms the correct calibration.

## 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

<b>Note</b>
<b>Applicability of technical specifications</b>
All technical specifications are valid after a warming-up period of 30 minutes.

### 10.1 Monitor characteristics

Typ	TFT, MVA mode
Active Area	1330.56 mm x 748.44 mm
Screen diagonal	60.1" (152.7 cm)
Resolution	3840 x 2160 (QFHD)
Refresh rate	60 Hz
Pixel arrangement	24 bit (3 x 8 bit): 3 subpixels per pixel
Pixel spacing	0.3465 mm x 0.3465 mm
Contrast ratio	4000:1 typical
Horizontal viewing angle	176° typically for contrast ratio > 10:1
Vertical viewing angle	176° typically for contrast ratio > 10:1
Response time (gray to gray)	6 ms
Backlighting	780 LEDs
Screen brightness	Typically 520 cd/m <sup>2</sup> , uncontrolled
Lifetime Backlight	50 000 hours

### 10.2 Power supply

Power connector	Non-heating appliance socket
Line voltage	AC 100 ... 240 V (± 10 %)
Line frequency	50 ... 60 Hz (± 5 %)
Current consumption	max. 5 A ... max. 2.1 A
Maximum current consumption	500 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 (QFHD) at 60 Hz Service and communication over DDC of DVI socket B
-----------	--

RJ 45	Service or software update
2 x 5 V/max. 1 A	For connecting external devices
2 USB (downstream)	For connecting external USB devices
1 USB (upstream)	For communication with the PC
4-pin mini-DIN socket (serial connection)	For connecting a photometer

## 10.4 Controls and connectors

Front	1 operation LED
Rear side	<ul style="list-style-type: none"> <li>• 1 power switch</li> <li>• 4-pin mini-DIN socket</li> </ul> Protected by a cover: <ul style="list-style-type: none"> <li>• 1 power connection socket</li> <li>• 2 DVI, dual link</li> <li>• 2 5 V/max. 1A</li> <li>• 2 USB (downstream)</li> <li>• 1 USB (upstream)</li> </ul>

## 10.5 Mechanical design

Housing components	Metal
Ventilation openings	In rear panel
Degree of protection	IP20 according to EN 60529 IP20: Front sealed in accordance with IP65
Connector panel	On rear panel, under cover
Weight	
• RadiForce LX600W	52 kg +/- 3 kg
• RadiForce LX600WP	62 kg +/- 3 kg
Dimensions (W x H x D) in mm	
• RadiForce LX600W	1390 x 800 x 144
• RadiForce LX600WP	1390 x 800 x 148

## 10.6 Climatic conditions

Operation	
Temperature range	+5 °C ... +40 °C Ambient temperature
Temperature gradient	Max. 5 °C/h, no condensation
Air pressure	700 ... 1060 hPa

Transport and storage (packed)	
Temperature range	-20 °C ... +55 °C ambient temperature
Temperature gradient	Max. 5 °C/h, no condensation
Humidity	10 ... 95 %, non condensing, at 25 °C
Air pressure	500 ... 1060 hPa

## 10.7 Mechanical requirements

Operation	
Vibrations	According to EN 60068-2-6 10 ... 58 Hz at ± 0.075 mm deflection 58 ... 500 Hz at 10 m/s <sup>2</sup> , 10 cycles per axis
Shock	According to EN 60068-2-27 50 m/s <sup>2</sup> half-sine, 3 shocks per axis

Packaged unit	
Vibrations	According to EN 60068-2-64
Shock	According to EN 60068-2-27

## 10.8 Safety regulations



This product has been assigned a CE marking in compliance with the directives of guideline 93/42/EEC of June 14, 1993, concerning medical products.

Safety regulations	
Safety standards	<ul style="list-style-type: none"> <li>• IEC/EN 60601-1 (Second Edition)</li> <li>• IEC/EN 60601-1 (Third Edition)</li> <li>• CAN/CSA - C 22.2 No. 601.1-M90</li> <li>• CAN/CSA - C 22.2 No.60601-1-08</li> <li>• GB4943.1 (non-tropical, altitude &lt; 2000 m)</li> </ul>
Protection class	Protection class I
Degree of protection	IP20
Conformity	CE according to MDD 93/42/EEC (Class I)

## 10.9 Electromagnetic compatibility

Noise immunity/interference emissions	<ul style="list-style-type: none"> <li>• EN 60601-1-2 Class B</li> <li>• EN 55011:2007 + A2:2007</li> <li>• FCC/ICES: FCC part15 subpartB/ICES003</li> <li>• C-Tick: AS/NZS CISPR22:2006, AS/NZS 61000-3-2:2007 + A1:2009</li> <li>• VCCI/JEIDA: CISPR22:2005, JIS C61000-3-2:2005</li> </ul>
Electrostatic discharge on casing parts (ESD)	EN 61000-4-2 8 kV air, 6 kV contact
RF irradiation	EN 61000-4-3 80 MHz ... 2 500 MHz, 3 V/m 80 % AM 1 kHz
Burst on power cables	EN 61000-4-4 2 kV
Burst on signal lines	EN 61000-4-4 1 kV
Surge on power cables	EN 61000-4-5 1 kV symmetric, 2 kV unsymmetrical
Magnetic fields	EN 61000-4-8
• Constant fields	4000 A/m (maximum)
• Alternating fields	1000 Aeff/m (maximum)
Voltage fluctuations	EN 61000-4-11
Line reaction to harmonics	EN 61000-3-2:2006 + A1:2009 + A2:2009 GB17625.1
Line reaction to voltage fluctuations	EN 61000-3-3
Limits of radio disturbance characteristics	GB9254

### See also

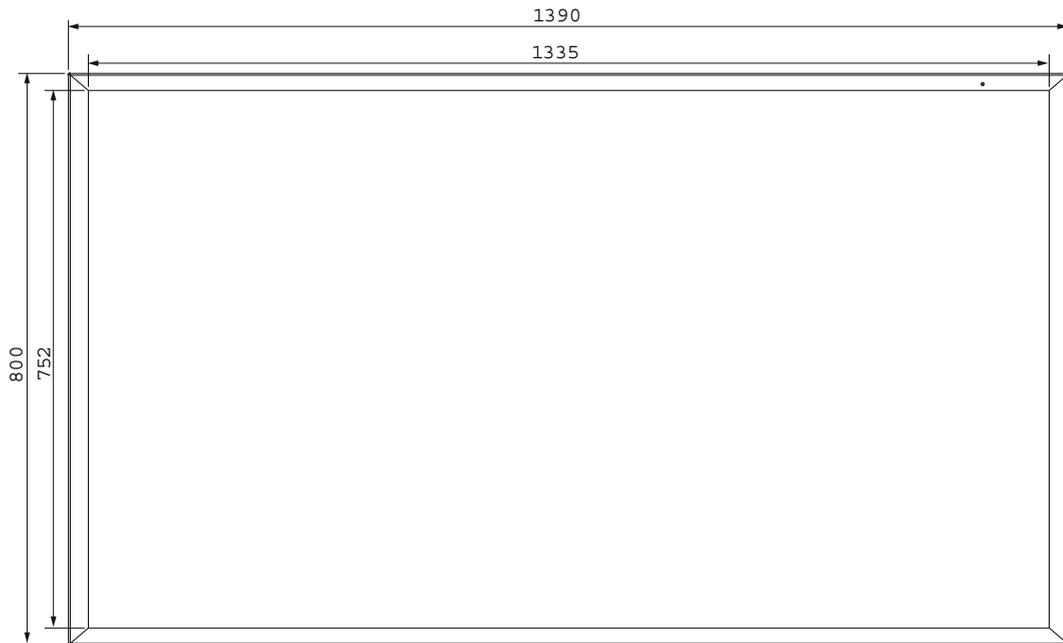
Guidance and manufacturer's declaration – electromagnetic emissions [▶ 42]

## 11 Dimensional drawings

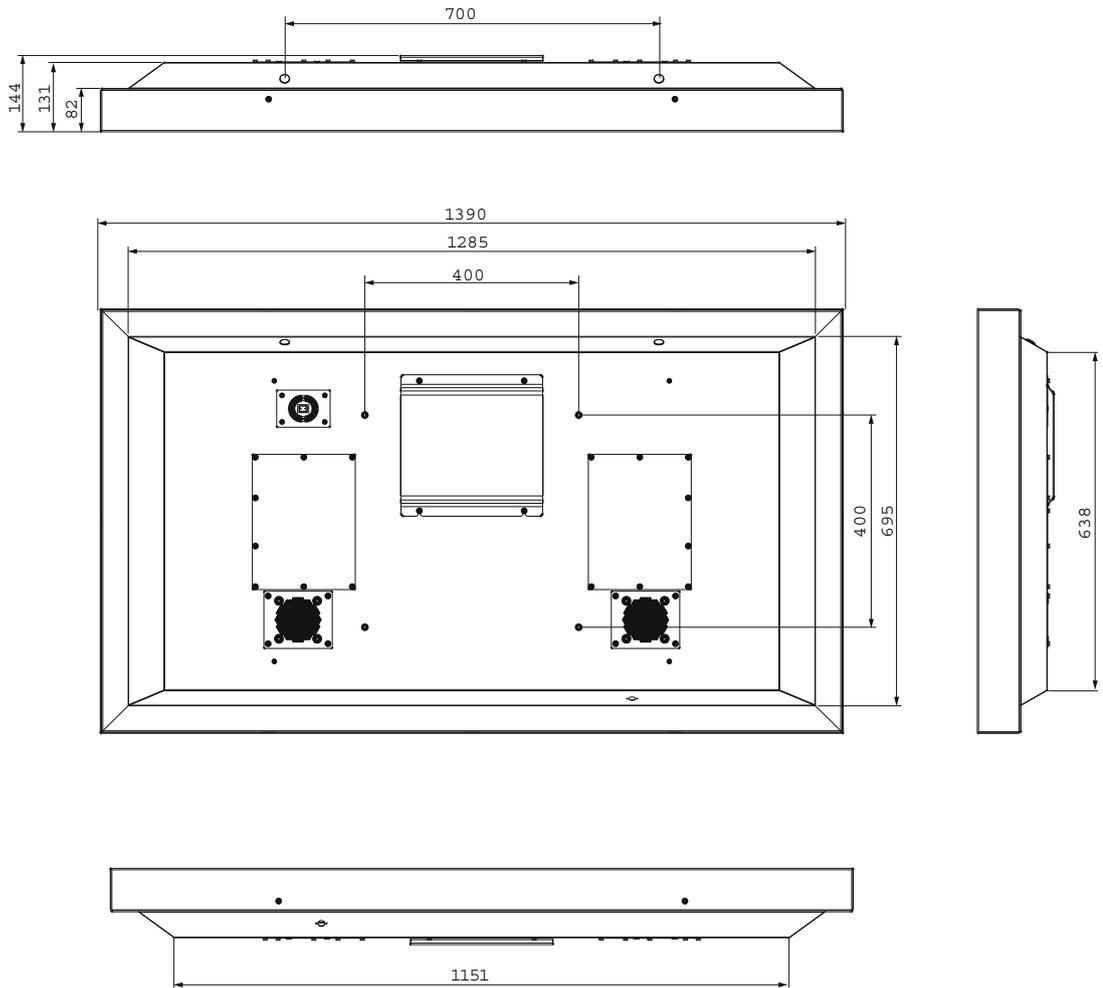
All dimensions in mm

### 11.1 Dimensions of RadiForce® LX600W

Front view



**View from above, right and rear - with cover**

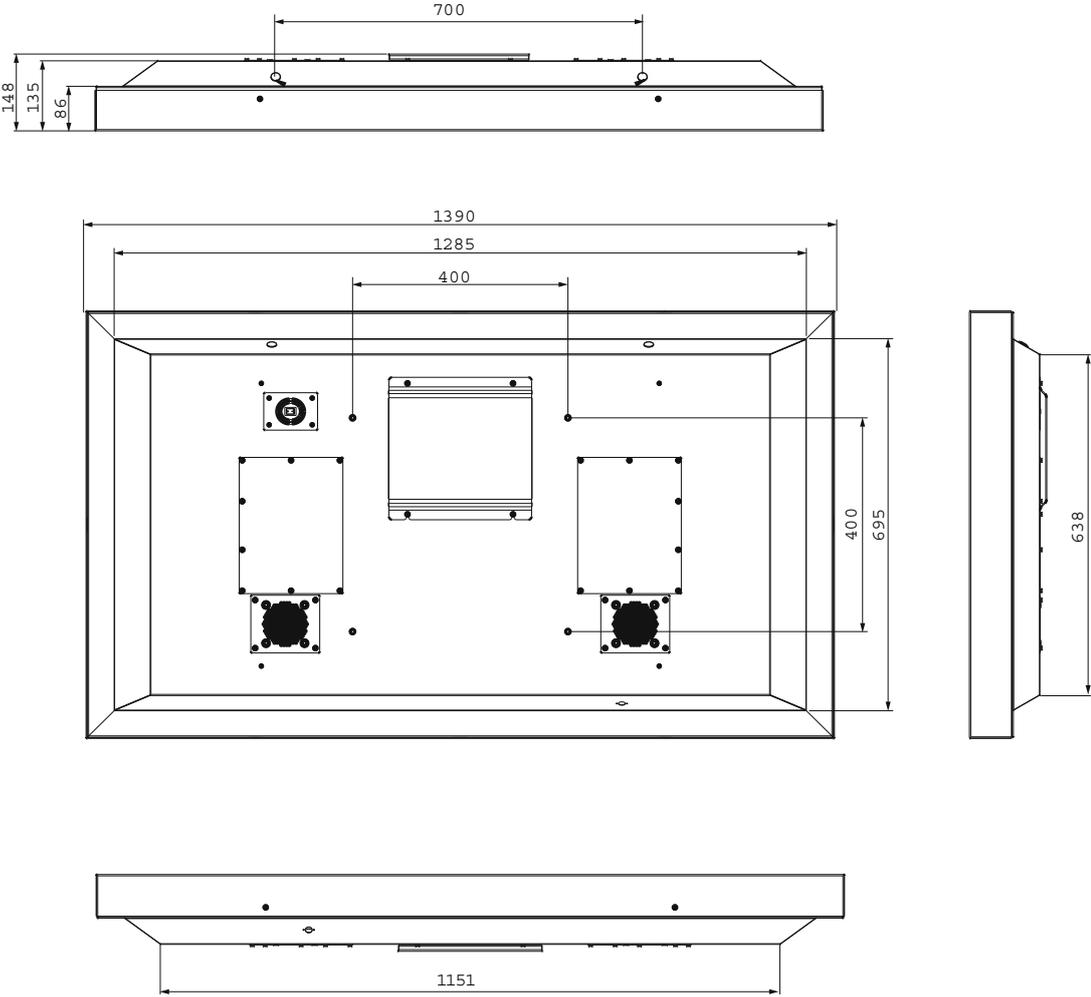


## 11.2 Dimensions of RadiForce® LX600WP

### Front view



**View from above, right and rear - with cover**



## 12 Appendix

### 12.1 Guidance and manufacturer's declaration – electromagnetic emissions

The RadiForce LX600W monitor is intended for use in the environment specified below. The user of the monitor should ensure that it is used in such an environment.

Interference emission measurements	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	The RadiForce LX600W monitor uses RF energy only for its internal functioning. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The RadiForce LX600W monitor is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies	

#### See also

Electromagnetic compatibility [▶ 37]

### 12.2 Markings and symbols

The markings and symbols on the device have the following meanings:

Marking/symbol	Meaning (location on device)
	Symbol for "Caution, observe accompanying documents". (name plate).
	CE marking (EU conformity mark). (name plate).
Electrical Safety 	MET marking, in accordance with U.S. and Canadian national regulations. (name plate).
	CCC marking, in accordance with for Chinese national regulations. (name plate).

Marking/symbol	Meaning (location on device)
	Symbol for date of production for medical products. (name plate).
	WEEE marking: Product must be disposed of separately; materials may be recycled. (name plate).
	Marking according to ACPEIP (China-RoHS). (name plate)
	"On" symbol (voltage) (power switch)
	"Off" symbol (voltage) (power switch)
	Input for service calls. (PS2 socket)
	Symbol "Comply with the instruction manual". (device)
	Symbol for "Authorized service personnel only". (device)

## 12.3 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.

## 12.4 Repairs

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

## 12.5 Environmental protection

Please observe all local requirements and laws pertaining to the disposal of devices.

## **12.6 Accessory devices**

Connected devices such as PCs must meet the relevant safety standards.

## **12.7 Contact**

### **Support during installation and for technical questions**

Medical Solutions (<http://www.eizo.com>)

## **12.8 Trademarks**

EIZO Logo is a registered trademark of EIZO Corporation in Japan and other countries.

EIZO is a registered trademark of EIZO Corporation in Japan and other countries.

RadiForce is a registered trademark of EIZO Corporation in Japan and other countries.

RadiCS is a registered trademark of EIZO Corporation in Japan and other countries.

RadiNET is a registered trademark of EIZO Corporation in Japan and other countries.

ScreenManager is a registered trademark of EIZO Corporation in Japan and other countries.

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

Apple is a registered trademark of Apple Inc.

Macintosh is a registered trademark of Apple Inc.

Mac is a registered trademark of Apple Inc.

VESA is a registered trademark of Video Electronics Standards Association in the United States and other countries.

All other trademarks are the properties of their respective owners.

## 12.9 China RoHS (Restriction of Hazardous Substances)

### LCD Monitor 液晶显示器

型号 Model: 6GF6200-8L\$##

根据 SJ/T11364-2006 《电子信息产品污染控制标识要求》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/T11364-2006 Marking for Control of Pollution caused by Electronic Information Products.

### 电子信息产品污染控制标志说明 Explanation of Pollution Control Label



该标志表明本产品含有超过中国标准 SJ/T11363-2006 《电子信息产品中有毒有害物质的限量要求》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。

为保证所声明的环保使用期限，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，以保证所声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 SJ/T11363-2006 *Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information 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

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 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毒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。

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

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 SJ/T11363-2006

- Data listed in the table represents 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.

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Instruction for Use, 11/2013  
RadiForce LX600W  
1031442-003