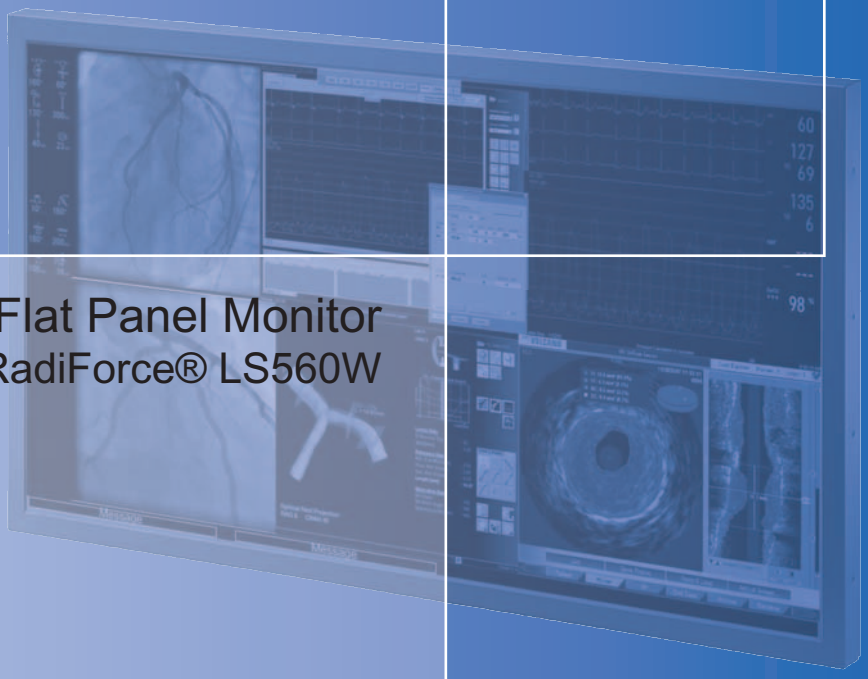
Instruction Manual • 04/2012



8MP 56" Color Flat Panel Monitor
RadiForce® LS560W

display SOLUTIONS

EIZO®

LCD monitors for medical applications

8MP 56" Color Flat Panel Monitor RadiForce® LS560W

Instruction Manual

04/2012

A5E10000920A-006

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
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE
indicates that an unintended result or situation can occur if the relevant information is not taken into account.

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:

⚠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.

For Medical Use in the United States

Caution: Federal law restricts this device to sale by or on the order of a physician

EIZO GmbH
Display Technologies
Siemensallee 84
76187 KARLSRUHE
GERMANY

A5E10000920A-006
℗ 04/2012 Technical data subject to change

Table of contents

Introduction 1

1.1 Contents of this document

This document explains the functionality and the approved application of the RadiForce® LS560W 56" Color Flat Panel Monitor.

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.

1.2 Proper use

The RadiForce® LS560W is intended to be used by health care professionals to integrate the video output from various commercially-available instruments commonly used in a medical procedure laboratory into a single video monitor.

The RadiForce® LS560W can replace up to eight single 1 mega pixel monitors used with modalities in ceiling suspension units.

This modality application requires monitors with internal factory preset Look Up Tables in order to adapt the monitors to the human visual system. These 1 mega pixel monitors need not be calibrated on site.

The 8 mega pixel monitor RadiForce® LS560W offers five factory preset internal Look up Tables.

Safety notes

2

Please note that LCD monitors such as the RadiForce® LS560W do not exhibit a zero error rate and that the image parameters can change over time (e.g. color density or distortion/fading of colors).

- Please ensure that all necessary steps are taken to avoid violations or incorrect diagnoses.
- Although the monitor itself does not require any maintenance actions, EIZO recommends cleaning the monitor on a regular basis and performing image quality reviews in accordance with all applicable local regulations.

In this document, the term "users" refers to medical personnel (e.g. radiology technician, medical technician), while the term "servicing" implies specifically trained and authorized personnel (e.g. hospital technician, medical equipment manufacturer).

2.1 General safety notes

Flawless, safe and reliable operation of the equipment assumes that it has been professionally transported, stored, mounted and installed as well as careful operator control and service. The units may only be used for applications for which monitors are normally used.

For safety reasons, the following precautions must be observed:

⚠DANGER

There is a danger to life if warnings are not obeyed. Severe personal injury or damage to property may occur. Please observe all warning information present on the display and in the instruction manual.

Do not open the display

The display may only be opened by trained and qualified personnel. There is risk of an electric shock.

Components inside the displays are at high voltage. **Touching these components is extremely dangerous!**

Servicing and maintenance must be carried out by qualified personnel only.

No liability is accepted for damage to property or injury to persons if the display is opened by non-qualified personnel.

Never use defective power cables

A damaged power cable may result in fire or electric shock. Only use power cables approved by the manufacturer.

When disconnecting the power supply cable, always do so by holding the plug. Ensure that your hands are dry.

Route the cable such that it cannot be tripped over.

Do not insert any objects into the housing

Objects inserted into the housing may result in damage to the unit or personal injury.

Do not place any objects on top of the unit

If you place objects on top of the unit, the unit may overheat.

Liquid entering the unit may result in fire or electric shock.

Connecting

There must be no contact to a patient when handling the connection cables.

Overload

Do not connect too many devices to one socket or extension cable since this could result in a fire or electric shock.

Observe the information provided by the manufacturer.

CAUTION

Improper installation may result in extensive damage to property.
Installation must be carried out by specialists.

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

   In order to guarantee that the housing discharge current in the event of a first fault does not exceed 500 µA, the display must be connected to an additional PE connection. The bracket of the display's support mechanism has its own grounding (PE conductor). This grounding together with the PE conductor of the display means that the housing discharge current always remains less than 500 µA, even in the event of a first fault. The PE conductors of the display and of the separate PC are considered as a first fault event.
2. Use appropriate measures to ensure that the leakage currents in particular remain below the necessary limits:

   Appropriate measures include:
   - Separators for signal input or signal output unit
   - Use of a safety isolating transformer
   - Use of the additional protective conductor terminal
3. Device and patient must never be touched simultaneously.
4. It must be specifically mentioned that the display is only suitable for a patient environment, but not for contact with a patient.
5. Only use the video lines specified by the manufacturer for installation.

   The serial interface cable must have a female Sub-D connector at the computer end.
6. Use power cables with PE contacts. Only plug the device into sockets with protective grounding.
7. For certain applications, the video ground can be connected separately to the protective ground via the additional PE connection in the plug panel.
   Observe EN 60601-1-1 (IEC 60601-1-1).
8. Close the connection panel using the cover provided, and secure with the screws.
9. **Note for users:**

   The closed connection panel may only be opened by trained and qualified personnel.
10. **Servicing information:**

    If housing parts have to be removed for servicing, this must not be carried out in the presence of the patient or user. Only connect displays with a VESA connection on the rear panel to the power supply when the VESA plate is screwed on.
11. **Important:**

    Note that displays can fail and that the image properties such as brightness, contrast or color location can change with time.

Please ensure that all steps are taken to avoid injuries or incorrect diagnoses. Observe all regulations of the country in which the device is used.

CAUTION

Failure to observe warnings may result in substantial damage to property

Ensure sufficient heat dissipation

To ensure proper air circulation, observe appropriate spacing between neighboring objects when placing or mounting the devices.

Ventilation slots are provided on the housing base, the top of the cover, the rear panel and the side panels. The permissible ambient temperature range (see instruction manual) must not be violated.

- Installation on a desk:

  Place the unit on a solid and level surface. The installed stand, as well as the mounting surface, must be suitable for the weight of the unit.
- For ceiling suspension:

  The wall mount must be suitable for the weight of the unit.

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 display to excessive shocks

Take care when transporting! **Use the original packaging, and transport correctly oriented!** Be sure to protect the LCD module in particular from shocks.

Care of display / Cleaning agents

- The screen surface (front panel) is extremely sensitive to mechanical damage. Absolutely avoid scratches, shocks, etc.
- Remove water drops immediately; extended contact with water discolors the surface.
- Clean the screen and the housing using only the cleaning agents referred to in the instruction manual.

CAUTION

Touching the screen surface can result in brief disturbances to the image

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

Only switch on cold displays following their adaptation to room temperature

If the display is brought into a room with a higher or rising temperature, condensation is formed inside and outside the unit. In such a case, do not switch on the display until the condensation has evaporated. The display will otherwise be damaged.

What to do if the display is faulty

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

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

Information for installations 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.

Note for installations in China

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

See also

Installation site (Page 17)

Mounting the device (Page 19)

Connector locations (Page 25)

Description of connection procedure (Page 29)

Cleaning (Page 37)

Power supply connection (Page 27)

2.2 Product-specific safety notes

CAUTION
1. Do not connect devices which are not part of the medical system. 2. The device must only be opened by trained personnel. Disconnect the power plug before opening the device.

CAUTION
This is a class A device. This equipment may cause interference in a residential installation. In this case the user is encouraged to perform appropriate measures to correct the interference.

Description 3

3.1 Scope of delivery

Note

EIZO recommends that you keep the packaging material for subsequent transport of the monitor.

RadiForce® LS560W

The 8MP 56" Color Flat Panel Monitor is suitable for mounting on Display Ceiling Suspensions (DCS).

The RadiForce® LS560W monitor is especially suited to working with the Large Monitor Managers LMM56800 and LMM0802.

RadiForce® LS560W-ST

The RadiForce® LS560W-ST Color Flat Panel Monitor has an antimagnetic housing. All other features agree with those of the RadiForce® LS560W.

RadiForce® LS560W	Order No.: 6GF6200-8AA01
RadiForce® LS560W-ST	Order No.: 6GF6200-8AA02
RadiForce® LS560W GE	Order No.: 6GF6200-8AA03

Further components in the scope of delivery (only included with RadiForce® LS560W)

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 Instruction Manual and safety notes.

Optional components

Product	Order No.	Description
FWM6300	6GF6988-8BA02	Wall bracket
FST5600	6GF6988-8BA01	Stand
Protective glass pane for RadiForce® LS560W	6GF6200-8AA01-0AA0	Frame with protective glass for protection against mechanical damage.
PDC0100	6GF6010-0BA02	Analog DVI converter for conversion of analog signals to digital signals.
PDS0800	6GF6020-0AA0-1AA1	DVI splitter/scaler to operate a second monitor with the same image or to display the image on an HD monitor.
TDL3600 QL	6GF6010-4DB36	DVI transmission link for connecting the monitor to a remote video source.

3.2 Important features

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

Large 56" picture diagonal

With a picture diagonal of 56" and a resolution of 3840 x 2160 pixels, the monitor is suitable for simultaneous use of several image sources. Particularly when used together with the LMM56800 Large Monitor Manager, the monitor can be used highly flexibly for various applications, e.g. angiography, EP, cardiology applications.

Perfect picture reproduction thanks to LCD technology

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

The Color Flat Panel Monitor provides a flicker-free picture even with low refresh rates. This monitor thus fulfills even the strictest ergonomic requirements.

The Color Flat Panel 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 Color Flat Panel Monitor is equipped with an automated stability system (Fully Automated Stability) in accordance with the DICOM standard. The integrated stability system (ISS) ensures consistent luminance levels using an integral light sensor in the center of the backlight.

The monitor is precalibrated at the factory. It is supplied from factory with a total of five defined Look Up Tables. The saved calibration data simplify installation and servicing: Even if the graphics card or workstation is replaced, e.g. during upgrade, the graphics settings are retained and there is no need to recalibrate the monitor.

Increased failure safety

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

Communication interface

The operating states of the monitor can be read via the communication interface which is connected via the DVI port: The monitor can be set to a Power Safe Mode. In particular the operating capability of the monitor can be scanned via this interface.

Uniformity compensation

In order to achieve a uniform distribution of luminance, the RadiForce® LS560W monitor is provided with electronics for luminance correction. This electronics is calibrated in the factory.

Settings for optimizing the application

The monitor can be adapted to the local lighting conditions at the click of a mouse using the five preset practice-oriented Look Up Tables.

3.3 Medical subsystem

CAUTION
Use only trained and qualified personnel
The device may only be used by trained and qualified personnel.

The RadiForce® LS560W monitor can be part of a medical subsystem comprising the following components:

Mandatory Devices

1. Large Monitor LS560W
2. LMM56800 Large Monitor Manager

Accessories and Optional Devices

1. Analog-DVI Converter PDC0100
2. DVI Splitter/Scaler PDS0800
3. DVI Transmission Link TDL3600
4. Control Interface Device CID1000P
5. Front frame with protective glass for protection against mechanical damage.

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

The RadiForce® LS560W is intended to be used by health care professionals to integrate the video output from various commercially-available instruments commonly used in a medical procedure laboratory into a single video monitor.

The RadiForce® LS560W can replace up to eight single 1 mega pixel monitors used with modalities in ceiling suspension units.

This modality application requires monitors with internal factory preset Look Up Tables in order to adapt the monitors to the human visual system. These 1 mega pixel monitors need not be calibrated on site.

The 8 mega pixel monitor RadiForce® LS560W offers five factory preset internal Look up Tables.

Application planning 4

4.1 Installation site

Provide adequate ventilation

Ventilation holes are located on the rear of the housing.

If the ventilation holes are covered or closed, the heat generated in the device cannot be dissipated sufficiently.

- Do not cover the ventilation holes.
- Do not close the ventilation holes.

Ensure unimpeded access to the power switch

CAUTION
Power switches and connections must be accessible at all times When assembling or installing the device, ensure that the power switch and the connections are accessible at all times.

Avoid dusty environments

The monitor has been designed for use in the clean environment of medical diagnostics. The display dissipates heat through the openings at the rear. Dust from dirty environments can penetrate into the monitor through these openings. In the extreme case, deposits are possible which become evident as dark spots in a white picture and which can result in deterioration of the luminance.

- Protect the display from dust, e.g. during building measures at the installation location.

  Use the original packaging or service packaging for transport.

Observe the permissible ambient temperature range

The permissible ambient temperature range must not be violated.

Avoid reflections on the screen

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

- Note the cleaning instructions (Page 37).
- Position the monitor so that no reflections appear on the screen.

  The reflections can be caused by lights, windows, furniture with shiny surfaces, or light-colored walls.
- To avoid reflections on the monitor: Only use non-dazzling reflector lights for the ceiling lighting.

Change of environment

If brought from the cold into a warm environment, water may condense inside the unit. The device may be damaged if it is switched on in this state.

- Wait until the condensed water has evaporated, including that inside the device, before you switch it on. The warm-up procedure may last several hours.

See also

General safety notes (Page 8)

Cleaning (Page 37)

4.2 Distances and arrangement of units

Minimum distances from other devices and a wall

The monitor has a VESA-400 installation connection.

To ensure unimpeded access to the power switch:

- Ensure that the monitor is positioned at least 10 cm at the side and rear from a wall, and 15 cm from other equipment.

Sensitive panel surface: avoid shocks and impacts

The monitor, especially the panel surface, is sensitive to shock. An impact on the panel surface can lead to total failure.

- Avoid such mechanical influences at all costs.

If the monitor is installed to be movable

make sure that the moved mass does not endanger persons or fittings.

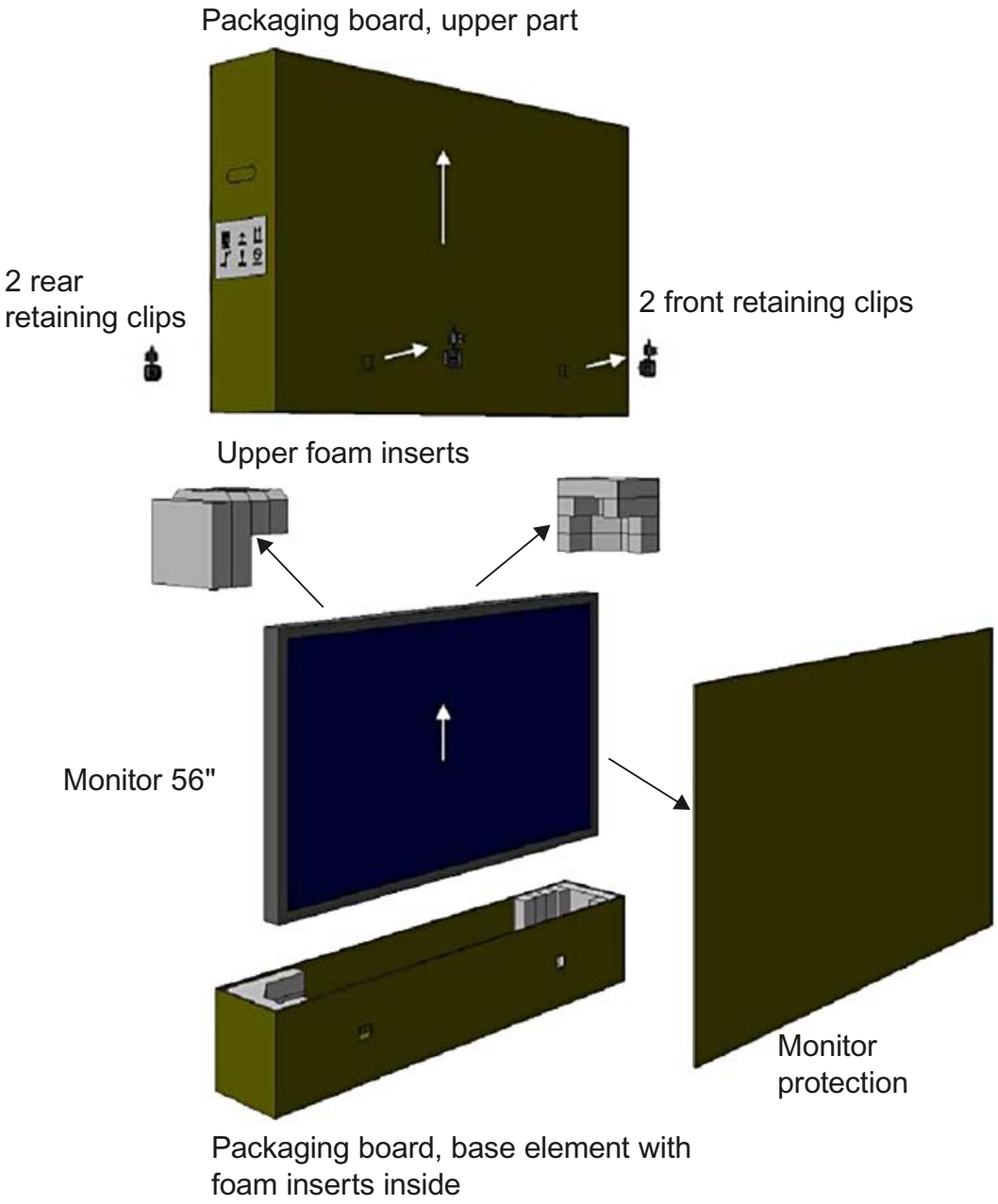
Assembly 5

5.1 Mounting the device

Taking the device out of the packaging

⚠ CAUTION
Protect against injuries by means of adequate protective equipment • The device must be removed from the packaging and carried by at least 2 persons. • Wear appropriate protection to prevent injuries should the device be dropped.

1. Open the packaging carefully and remove from the monitor.
   Make sure that the monitor cannot tip over.
2. Hold the device at the bottom and side, and remove from the packaging.


Packaging board, upper part
2 rear
retaining clips
2 front retaining clips
Upper foam inserts
Monitor 56"
Monitor
protection
Packaging board, base element with
foam inserts inside

Mounting the device

The monitor has a VESA adapter/400 x 400 mm.

Since the screws are of particular importance for the installation, observe the following:

Fastening screw specifications	
Number	4
Thread	M8
Strength	8.8 in accordance with ISO 898-1
Insertion depth	12 mm (minimum) / 16 mm (maximum)
Tightening torque	Max. 10 Nm

- The insertion depth of the fastening screw refers to the length of the part of the screw that enters the fixing hole in the monitor.
  - When calculating the total screw length, pay attention to the thickness of the support.
- The tightening torque is highly dependent on the material of the suspension unit.
  - Ensure that the material of the suspension unit is not damaged during assembly.
- Make sure when installing the monitor that the adapter is designed for 4-fold safety (monitor mass is 47 ± 2.5 kg).
- An installed stand must be sufficiently stable such that tilting (up to 10°) does not result in toppling of the device.
- Mounting units, e.g. a stand or wall bracket, must be tested and approved by the manufacturer for the weight to be supported.
  - Use the manufacturer's mounting units since these satisfy the required conditions.
- For installation without Display Ceiling Suspension, only use the following wall mount and stands:
  - **FWM6300**, wall mount - Order No.: 6GF6988-8BA02
  - **FST5600**, stand - Order No.: 6GF6988-8BA01

See also

General safety notes (Page 8)

Connecting 6

6.1 General connection information

⚠ CAUTION
All information and warnings related to this product must be observed to ensure danger-free operation.

CAUTION
Changes to device • Device settings may only be adjusted by trained service personnel; otherwise, the warranty is void. • Do not make any changes to the device without prior approval from the manufacturer.

CAUTION
Observe shielding measures The shielding measures described in the applicable national EMC guideline must be observed. If these guidelines are not observed, malfunction of the monitor may result. **Observe the grounding measures** To ensure that the permissible leakage current is not exceeded in the case of a fault, you must additionally ground the monitor with a separate ground line. **Information on cable installation** • Only shielded cables are permitted for all signal connections. • If the relevant facility is available on the connector, all plug connections must be screwed tight or locked. • If signal and power supply cables are routed next to one another, reversible pixel errors may occur if there is high interference on the power supply network. • The display 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. • Cable grips are provided in the device. Use these to secure the cables against unintentional loosening.

CAUTION
Completely disconnect device from the supply mains To completely disconnect the device from the supply mains, toggle the power switch on the rear of the monitor: • Move the power switch to the "OFF" position. The device is now switched off and disconnected from the supply mains.

6.2 Connector locations

⚠ CAUTION
Only for service: Opening the connector panel cover The connector panel cover must only be opened for servicing. Patients must not be present when the cover is open.

① Power connector
② Service connection
③ DVI A (front view: right half of the screen)
④ 5 V supply for external devices
⑤ 5 V supply for external devices
⑥ DVI B (front view: left half of the screen)
⑦ additional grounding screw

Figure 6-1 Connector panel without TDL3600-QL receiver

Power connector and DVI connectors

The power connector and the DVI connectors are located within the connector panel under a cover on the rear of the monitor.

5 V connections

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

Grounding screw

The additional protective ground is connected here.

Service connection

The service connection is used by service personnel for loading software updates.

Serial interface for photometer

CAUTION
• Only photometers tested for calibrating the equipment may be connected to the serial interface. • Only service personnel or those trained by them may connect or disconnect a device from the unit. • A photometer must not be connected in the presence of the patient.

The serial interface is freely accessible next to the fan at the center.

Serial Spot Meters and Advanced or Universal Serial Luminance Meters have been approved as photometers.

See also

General safety notes (Page 8)

DVI connector (Page 28)

Controls and connectors (Page 42)

Power supply connection (Page 27)

6.3 Power supply connection

⚠ DANGER

Only connect device to a supply mains with a PE conductor

WARNING: WARNING: To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

CAUTION

Only use the power cable supplied with the display, or a cable with a PE conductor and an appliance socket in accordance with DIN 49 547, IEC 320 (max. length 3 m, cable e.g. H05VV-F 3x1.0 mm²). Furthermore, the cable must adhere to all local safety regulations applicable to the specific country in which the display is used.

Information for installations 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.

Note for installations in China

Power cables, power supply plugs and appliance plugs must be CCC-certified.

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

- Check the permissible power supply range before connecting the monitor.

See also

General safety notes (Page 8)

Connector locations (Page 25)

Power supply (Page 41)

6.4 DVI connector

CAUTION
Make sure that the video source is set correctly
The monitor sends the correct settings to the video source via the DDC communication interface. If you change these settings, the images will not be displayed correctly.

CAUTION
Do not kink the cables
The cables must not be kinked. The minimum bending radius of the cable is 30 mm.

CAUTION
Removal/insertion of cables: only if monitor is turned off
Only when the monitor is turned off may DVI cables, TDL modules, or the cables of the TDL modules be inserted or removed.

The monitor receives digital DVI input signals and has two Dual Link DVI connectors (A and B).

- Only use the Dual Link DVI cables specified by EIZO or the TDL3600-QL transmission links available from EIZO.

  The picture quality, noise immunity and radiated interference of the entire system depend on cable quality and length.
- You must use a device tested in accordance with IEC 60601-1 or IEC 60950-1 to control the monitor.

See also

Connector locations (Page 25)

6.5 Description of connection procedure

Requirement

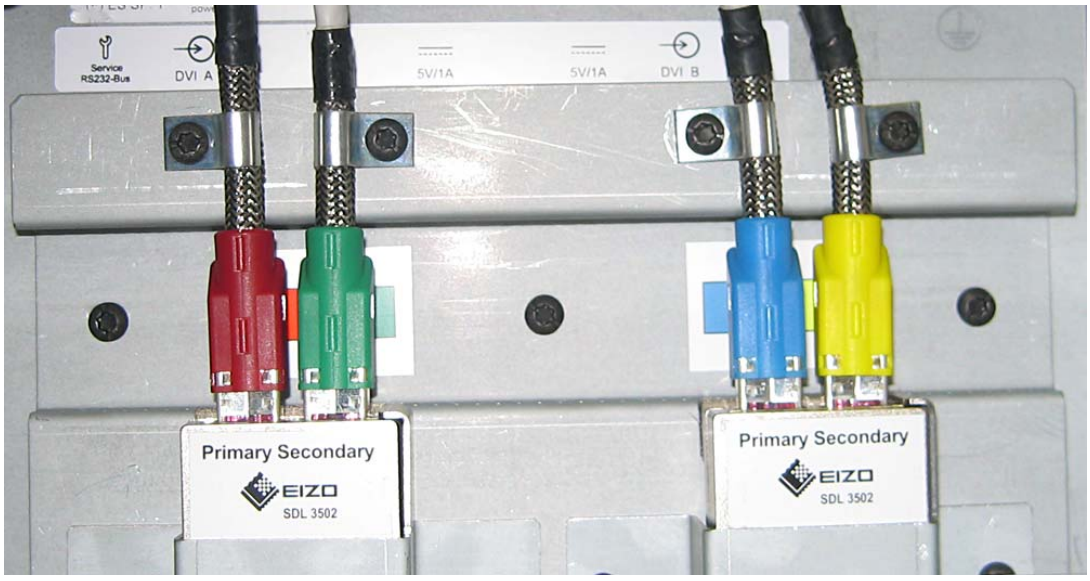
Device must already be mounted at the location of use.

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 the TDL3600-QL modules are used:

   Connect CAT cables to the connections of the DVI receiver modules, and tighten clamps. When connecting the cables, observe the color codes and customer-specific information.



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

See also

General safety notes (Page 8)

Commissioning 7

7.1 Use of the serial interface

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

The monitor has a serial RS-232 interface with a 6-pin mini-DIN socket. The following units may be connected to the socket:

- Universal Serial Luminance Meter with 9-pin Sub-D to 6-pin mini-DIN adapter
- Advanced Serial Luminance Meter with 9-pin Sub-D to 6-pin mini-DIN adapter
- Serial Spot Meter with 9-pin Sub-D to 6-pin mini-DIN adapter

7.2 Switching on the monitor and PC

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

Requirement

The PC and monitor are connected via DVI cables.
For best results, the graphics card and driver should support the DDC channel.

Switch on monitor before PC

1. Switching 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. Switching on the monitor.

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

CAUTION
The operation LED does not light green after power has been switched on? 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.

See also

Troubleshooting (Page 39)

7.3 Avoidance of image sticking

- Use a screen saver function in order to reduce "image sticking" that may occur with TFT displays.
- If the device is no longer required: Switch off the device.
- If the application permits a power saving mode, the device can be switched to this status: Set the option in your application for switching the device to power saving mode.

Image sticking

Image sticking is an effect in which a faint image of the previous screen contents can be seen after the display contents have changed. By using a screen saver with continuously changing screen contents, an unnecessary long depiction of a single image on the screen can be avoided.

See also

Troubleshooting (Page 39)

7.4 Graphics controller settings

The monitor can be used as a high-end PC monitor without the large monitor system. The monitor can be operated with any PC whose graphics card features two dual link outputs. The graphics card must support a resolution of 3840 by 2160 in "stretched mode". The DVI outputs must be operated in isochronous mode.

Control of the monitor with LMM56800 or LMM0802 Large Monitor Manager

No further parameter settings required

If the LMM56800 or LMM0802 Large Monitor Managers are used to control the RadiForce® LS560W, no settings to the graphics card are necessary. All parameters are set automatically by the Large Monitor Managers.

Control of the monitor without LMM56800 or LMM0802 Large Monitor Manager

Parameters need to be set

When the PC is switched on, the monitor properties are read out and the graphics card is initialized accordingly. The graphics card must support DDC communication. After this process, the monitor is recognized by Windows as a plug-and-play monitor. The EDID data (Extended Display Identification Data) are transmitted to the graphics card via the DVI cable's DDC channel.

1. To operate the monitor with the desired resolution, you must install a driver designed for the graphics card in use.
2. Once the driver has been successfully installed, you can configure the resolution as dictated by the driver and the operating system settings.

Note

Installation and parameterization of the graphics card

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

7.5 Information on the display settings

All displays are optimally preset in the factory, meaning that changes are not usually required.

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.

7.6 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.

- Generate a black test screen and examine the screen for luminous pixel errors.
- Generate a white test screen and examine the screen for non-luminous pixel errors.

Pixel defects on an LCD monitor can not be corrected.

Operation 8

8.1 Switching on the monitor and PC

Once installed, operating the display consists mainly of switching the power on and off.

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

See also

Troubleshooting (Page 39)

8.2 Measures in the event of an error

Should the display not function correctly, EIZO recommends checking all basic connections and possible operation errors before contacting service personnel.

See also

Troubleshooting (Page 39)

Service and maintenance

9

9.1 Cleaning

CAUTION
Device maintenance, cleaning and disinfecting • The front panel is extremely sensitive to mechanical damage. Avoid all scratches, knocks etc.! • Remove drops of liquid immediately; contact with liquids over a longer period can cause discoloration or allow calcium deposits to form on the surface. • Clean the front panel when dirty using a microfiber cloth and, if necessary, a recommended cleaning agent. Only clean housing parts using the recommended cleaning agents. • The entire monitor must only be disinfected using the tested disinfecting agents. • If cleaning agents are sprayed directly onto the monitor surface, use a microfiber cloth to catch drops which run down before they reach the edge of the panel.

Recommended cleaning agents and disinfectants for the monitor

Cleaning agents / disinfection agents	Maximum application time
terralin® protect; 2 vol. %	15 min
Meliseptol® rapid; direct	60 min
Mikrobac® Tissues; direct	30 min
Incidin® Plus; 8 vol. %	15 min
Melsitt®, 10 vol. %	120 min
Incidur-Spray, undiluted	120 min
perform®, 3 wt. %	120 min
Lysoformin®, 2 vol. %	120 min
Activ spray, undiluted	120 min
Terralin, 0.5 vol. %	120 min
Ethanol, 96 vol. %	180 min
Commercially available liquid detergent: Tempo	120 min
Distilled water	120 min
Spray disinfectant with Nocospray / Nocolyse	15 min spray duration + 60 min application time

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

9.2 Maintenance

Checking the monitor settings at regular intervals

The monitor is low-maintenance. The illumination properties of the monitor may change due to aging of the LCD unit and the backlight.

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

Measuring instruments

The following devices can be used as measuring instruments:

- Serial Spot Meter
- Universal Serial Luminance Meter
- Advanced Serial Luminance Meter

These photometers can be connected directly to the monitor.

Verifying and calibrating device properties

You can verify the device properties and calibrate them if necessary using the photometers.

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. This inspection is performed by reviewing the SMPTE image.

- The gray levels must be displayed correctly and visibly at both 5% and 95%.
- Alternatively, the VerLum image can serve as a useful test pattern.

  Successful calibration can be verified if the small squares are displayed correctly in all gray shades.

See also

Check for pixel defects (Page 34)

Use of the serial interface (Page 31)

Troubleshooting

10

The LED continuously lights up green when operating normally. In the event of a fault, localization is possible based on the screen image and the operation LED.

- Please check the potential fault causes and remedies listed in the table below before contacting service personnel.

No picture

Screen	LED	Cause	Remedy
No picture	Green	Video signal detected, but the monitor or graphics card is set up incorrectly	Check and adapt the graphics card settings.
		Power Safe Mode Monitor has been switched actively to a power saving mode.	Deactivate Power Safe Mode
	Yellow	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
		Zero or insufficient power from the power cable	Apply sufficient power
		Power cable is not inserted or incorrectly inserted	Check power cable
		Power cable is defective	Replace power cable
		Blown fuse	Inform servicing department

Picture displayed

Screen	LED	Cause	Remedy
Picture displayed	Green	No error, correct operating status	-
	Yellow	Lamp warm-up period: Setting is active, and the display 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)	Display has reached an initial critical temperature level.	Select a lower luminance 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 display having reached the stabilized luminance level.	Inform servicing department
	Red	Internal error	Inform servicing department

See also

Switching on the monitor and PC (Page 31)

Technical specifications

11

Applicability of technical specifications

All technical specifications are valid after a warming-up period of 30 minutes.

11.1 Monitor characteristics

Type	TFT, MVA mode
Screen size	1244.2 mm x 699.8 mm
Screen diagonal	56.2" (142.8 cm)
Resolution	3840 x 2160 (QFHD)
Refresh rate	60 Hz
Pixel arrangement	24 bit (3 x 8 bit): 3 subpixels per pixel
Pixel spacing	0.324 mm x 0.324 mm
Contrast ratio	Typically 1200:1
Horizontal viewing angle	Typically 176° at CR: > 10:1
Vertical viewing angle	Typically 176° at CR: > 10:1
Response time (gray to gray)	6.5 ms
Backlighting	32 CCFL
Screen brightness	Typically 450 cd/m², uncontrolled
Lifetime of backlight	Typically 50 000 hours (at operating temperature of 25 °C)

11.2 Power supply

Power connector	Non-heating appliance socket
Line voltage	100 ... 240 V AC (± 10%)
Line frequency	50 ... 60 Hz (± 5 %)
Current consumption	max. 5 A ... max. 2.0 A

11.3 Inputs/outputs

DVI input	Dual link DVI-I socket (analog pins are not used) - 2 x 1920 x 2160 at 60 Hz
RJ 45	Service or software update
2 x 5 V/max. 1 A	For connecting external devices

11.4 Controls and connectors

Front	1x operation LED
Rear side	• 1x power switch • 4-pin mini-DIN socket Protected by a cover: • 1x power connection socket • 2x DVI, dual link • 2 x 5 V/max. 1A

11.5 Mechanical design

Housing components	Metal
Ventilation openings	In rear panel
Degree of protection	IP20 to EN 60529
Connection compartment	On rear panel, under cover
Weight	47.5 ± 2.5 kg
Dimensions (W x H x D) in mm	1319 x 776 x 145

11.6 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

11.7 Mechanical requirements

Operation

Vibrations	To EN 60068-2-6 10 ... 58 Hz at ± 0.075 mm oscillation 58 ... 500 Hz at 10 m/s², 10 cycles per axis
Shock	To EN 60068-2-27; EN 60721-3-3 50 m/s² half-sine, 3 shocks per axis

Packaged unit

Vibrations	To EN 60068-2-64 EN 60721-3-2, Class 2M2
Shock	To EN 60068-2-27

11.8 Safety directives

CE

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 standards	• IEC/EN 60601-1 (Second Edition) • IEC/EN 60601-1 (Third Edition) • CAN/CSA - C 22.2 No. 601.1-M90 • CAN/CSA - C 22.2 No.60601-1-08 • UL 60601-1
Protection class	Protection class I
Degree of protection	IP20
Conformity	CE in accordance with MDD 93/42/EEC (Class I)

11.9 Electromagnetic compatibility

Interference voltage/emitted noise	EN 60601-1-2 Class A FCC Class A
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 unsymmetric
Electrostatic discharge on casing parts (ESD)	EN 61000-4-2 8 kV air, 6 kV contact
RF irradiation	EN 61000-4-3 80 MHz ... 2500 MHz, 3 V/m 80 % AM 1 kHz
	EN 61000-4-8
Constant magnetic fields	4000 A/m (maximum)
Alternating magnetic fields	1000 Aeff/m (maximum)
Line reaction to harmonics	EN 61000-3-2
Line reaction to voltage fluctuations	EN 61000-3-3
Voltage fluctuations	EN 61000-4-11

See also

Guidance and manufacturer's declaration – electromagnetic emissions (Page 47)

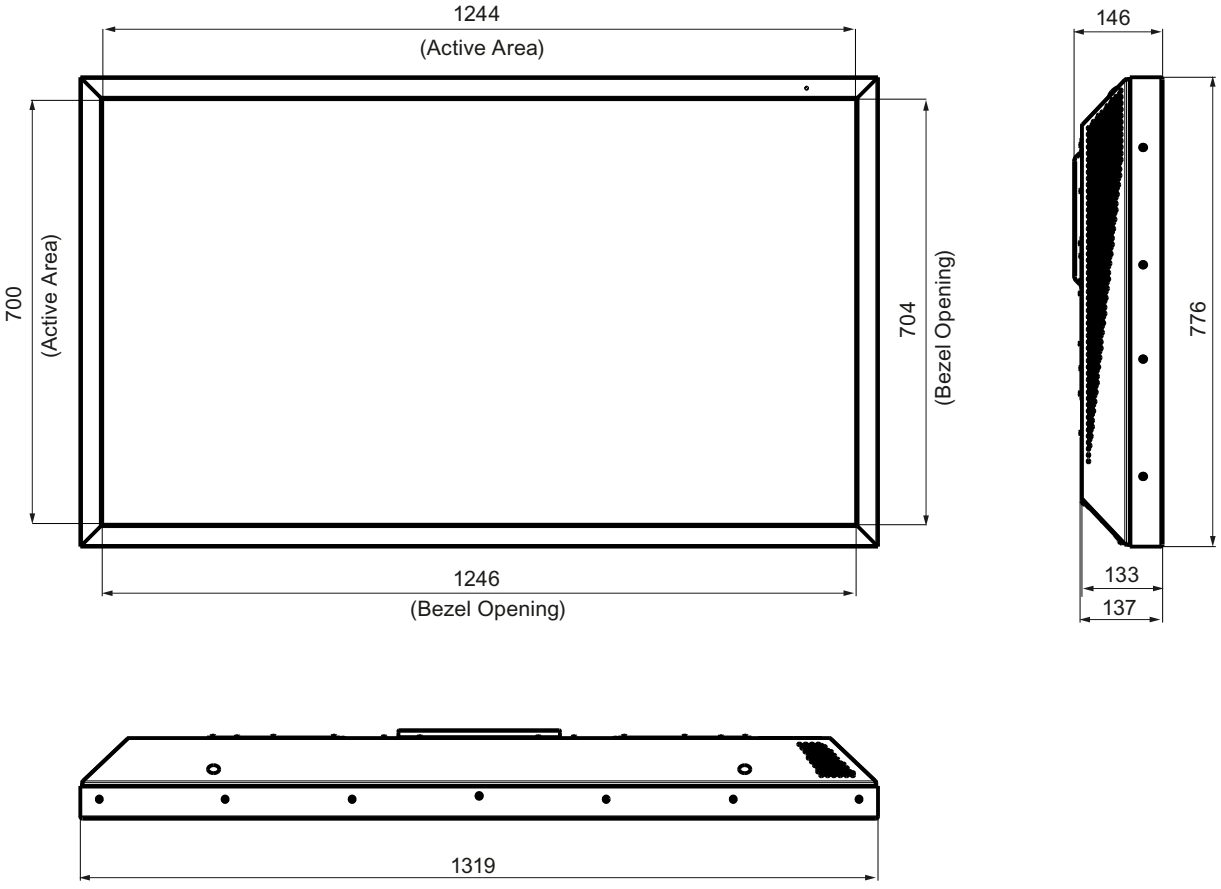
Dimensional drawings

12

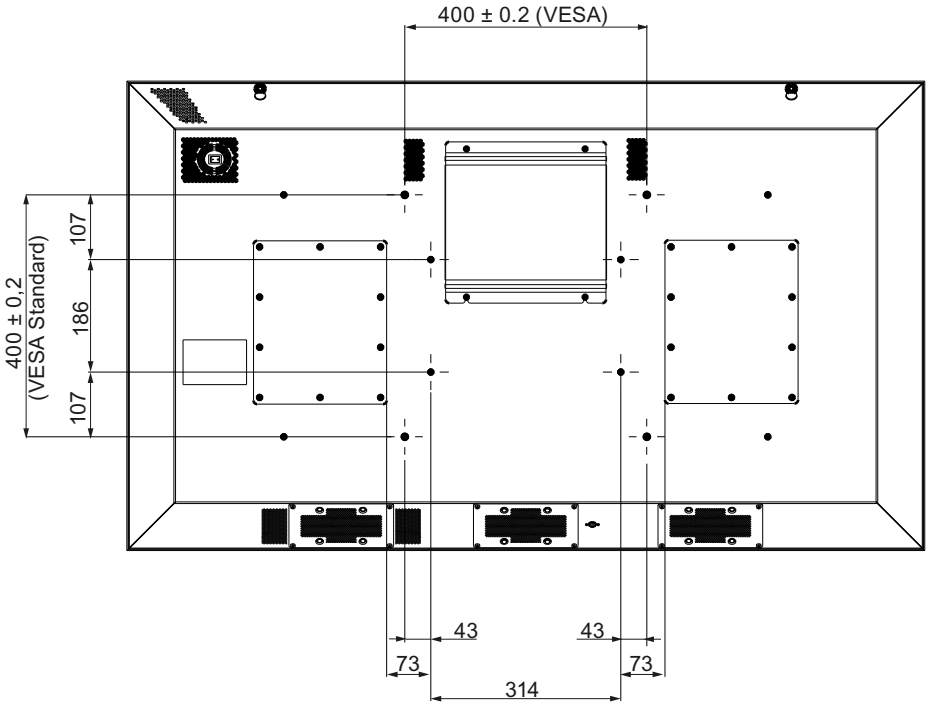
All dimensions in mm

12.1 Landscape installation

12.1.1 Front view



12.1.2 Rear view



Appendix

A

A.1 Guidance and manufacturer's declaration – electromagnetic emissions

The monitor RadiForce® LS560W is intended for use in the environment specified below. The customer or the user of the monitor should ensure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	The monitor RadiForce® LS560W uses RF energy only for its internal functions. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The RadiForce® LS560W monitor is not suitable for use in domestic establishments and establishments directly connected to the public low-voltage power supply network that also 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 (Page 44)

General safety notes (Page 8)

A.2 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.

Limited warranty period

Warranty period for following product components

LCD panel of the monitor	24 months
Brightness setting	None
Panel qualification (bright points, black points)	None

A.3 Repairs

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

A.4 Environmental protection

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

A.5 Accessory devices

Devices connected to the monitor (e.g. PC) must also comply with the relevant safety specifications.

A.6 Contact

Support during installation and for technical questions

EIZO Global (www.eizo.com)

A.7 Trademarks

The EIZO Logo is a registered trademark of EIZO NANAO CORPORATION in Japan and other countries.

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

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

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

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

ScreenManager is a registered trademark of EIZO NANAO 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 or a trademark of Video Electronics Standards Association in the United States and other countries.

All other trademarks are the properties of their respective owners.

A.8 China RoHS (Restriction of Hazardous Substances)

LCD Monitor 液晶显示器
型号 Model: 6GF6200-8A###

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 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
平面灯 Flat Lamp	X	X	O	O	O	O
背光逆变器 Backlight Inverter	O	O	O	O	O	O
控制板 Controller Board	O	O	O	O	O	O
电源 Power Supply	O	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） Acessories (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.

Index

O

P

S

U

V

W

Order No.: A5E10000920A-006

EIZO GmbH
Display Technologies

Siemensallee 84
76187 KARLSRUHE
GERMANY

www.eizo.eu