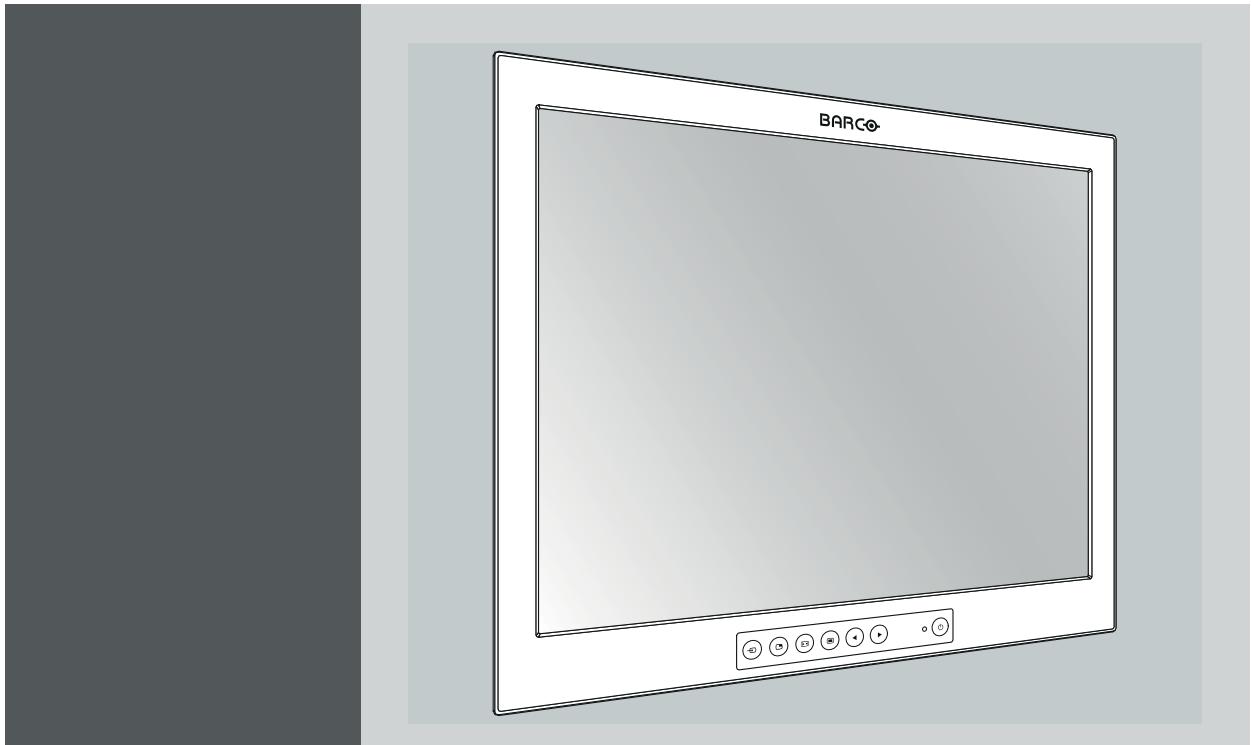


**E192HSA**



**User Guide**  
19-inch medical grade color display

**Barco NV**

President Kennedypark 35, 8500 Kortrijk, Belgium

Phone: +32 56.23.32.11

Fax: +32 56.26.22.62

Support: [www.barco.com/en/support](http://www.barco.com/en/support)

Visit us at the web: [www.barco.com](http://www.barco.com)

## TABLE OF CONTENTS

<b>1. Welcome!</b> .....	<b>3</b>
1.1 About the product .....	3
1.2 What's in the box .....	3
<b>2. Parts, controls and connectors</b> .....	<b>5</b>
2.1 Front view .....	5
2.2 Rear view .....	6
2.3 Connector view .....	6
2.4 Connector pin assignments .....	7
2.4.1 Input power connector .....	7
2.4.2 DVI connector (DVI-D) .....	7
2.4.3 RS232 connector .....	8
2.4.4 S-Video and S-Video-out connector .....	8
2.4.5 VGA connector .....	9
<b>3. Display installation</b> .....	<b>11</b>
3.1 Interface connection .....	11
3.2 Power supply connection .....	12
3.3 VESA mount installation .....	13
<b>4. Daily operation</b> .....	<b>15</b>
4.1 Power LED .....	15
4.2 On/Off switching .....	15
4.3 Power save mode .....	15
4.4 OSD menu activation .....	16
4.5 OSD menu navigation .....	16
4.6 Shortkey functions .....	17
4.6.1 Main source selection .....	18
4.6.2 Multi-image configuration .....	18
4.6.3 Zoom factor selection .....	18
4.6.4 Brightness adjustment .....	18
4.6.5 Picture swap .....	19
<b>5. Advanced operation</b> .....	<b>21</b>
5.1 OSD picture menu .....	21
5.1.1 Profile .....	21
5.1.2 Brightness .....	21
5.1.3 Contrast .....	22
5.1.4 Saturation .....	22
5.1.5 Color temperature .....	22
5.1.6 Gamma .....	23
5.1.7 Sharpness .....	23
5.2 Picture Advanced menu .....	23
5.2.1 Black Level .....	23
5.2.2 Smart Video .....	24
5.2.3 Image Position .....	24
5.2.4 Auto Adjustment .....	24
5.2.5 Phase .....	25
5.2.6 Clock/Line .....	25
5.3 Display Format menu .....	25
5.3.1 Main Source (Primary Source) .....	26
5.3.2 Component Mode .....	26
5.3.3 Zoom .....	26
5.3.4 Image Size .....	27
5.3.5 2 <sup>nd</sup> Picture Mode .....	27
5.3.6 2 <sup>nd</sup> Picture Source .....	28
5.3.7 2 <sup>nd</sup> Picture Position .....	28
5.3.8 Picture Swap .....	29

## Table of contents

---

5.4 Configuration menu .....	29
5.4.1 Information .....	29
5.4.2 Language .....	30
5.4.3 OSD setting .....	30
5.4.3.1 OSD Horizontal Position .....	30
5.4.3.2 OSD Vertical Position .....	30
5.4.3.3 OSD Time-out .....	30
5.4.4 Recall Profile .....	31
5.4.5 Save Profile .....	31
5.5 System menu .....	32
5.5.1 Power on DVI 1 .....	32
5.5.2 DVI Output .....	32
5.5.3 Keyboard lock .....	32
5.5.4 Power Saving .....	33
<b>6. Important information .....</b>	<b>35</b>
6.1 Safety information .....	35
6.2 Environmental information .....	38
6.3 Biological hazard and returns .....	40
6.4 Regulatory compliance information .....	40
6.5 Cleaning and disinfection .....	41
6.6 Explanation of symbols .....	41
6.7 Legal disclaimer .....	43
6.8 Technical specifications .....	43

# 1. WELCOME!

## 1.1 About the product

---

### Overview

The Medical Grade E192HSA is a color active matrix, liquid crystal display exclusively designed for medical imaging applications.

The E192HSA is part of an LCD-display product line specifically designed for medical applications. Its wide number of features makes this product the ideal solution for Endoscopy and operating rooms. With its sophisticated signal processing the product offers detailed, sharp, accurate, noise-free pictures, perfect when coupled with state-of-the-art Endoscopy equipment and in spite of the different aspect ratio it also supports Full-HD video signals.

The other key features of the E192HSA series are:

- State-of-the-art LCD screen
- Sophisticated signal processing specifically designed for low-noise, flicker-free image that minimizes the doctor's eye fatigue.  
In addition its internal 10-bit digital signal processing provides accurate color reproduction for the detection of the most subtle color changes.
- For critical operations the monitor can reduce to a minimum the picture delay typical of all the digital displays, thus closing the gap with CRT monitors.
- Full range of analog and digital Video inputs; analog and digital computer inputs up to WUXGA. Accepted HD formats are:
  - 720p (SDI, DVI-D/HDMI compatible, YPbPr)
  - 1080i (SDI, DVI-D/HDMI compatible, YPbPr)
  - 1080p (SDI, DVI-D/HDMI compatible, YPbPr)
- Multi-Image modality. It allows the presentation of 2 full HD images as:
  - Picture-in-Picture: the secondary image is displayed in a small window.
  - Side-by-Side: the screen is divided in 2 equal parts.
- RS232 Serial Interface for remote control (detailed specs available on request).
- User-selectable Gamma functions, including DICOM-like curve.
- Universal mounting (VESA 100).
- Easy cleaning thanks to chemical resistant front surface (Protection screen).
- Luminance and grayscale stability versus viewing angle.

### Model identification

The monitor described in this manual, has been certified and registered by the safety agencies & regulatory authorities under the model number: MED19OR

## 1.2 What's in the box

---

### Overview

Your E192HSA display comes with:

## 1. Welcome!

---

- E192HSA user guide
- DVI cable
- AC power cords
- external power supply
- 4 screws, 4 dented washers and an Allen key

---



**Keep your original packaging. It is designed for this display and is the ideal protection during transport.**

---

## 2. PARTS, CONTROLS AND CONNECTORS

### 2.1 Front view

---

#### Overview

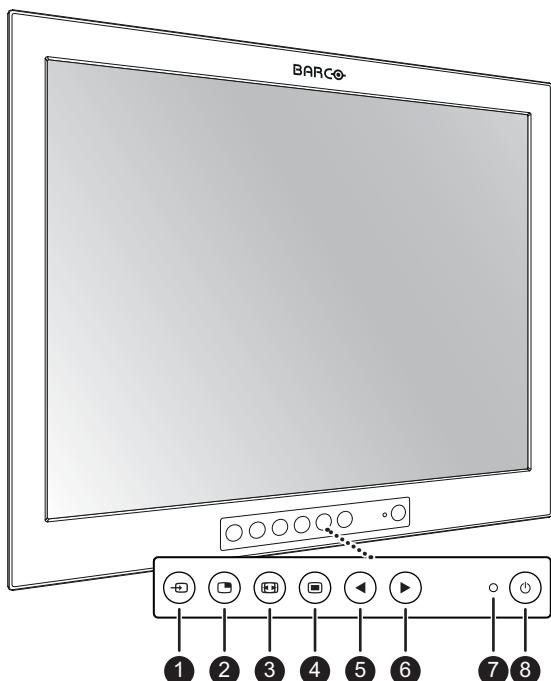


Image 2-1

1. Input Selection key
2. Multi-image selection key / Down key
3. Image zoom key / Up key
4. OSD Menu key / Enter key
5. Brightness decrease / Left key
6. Brightness increase / Right key
7. Power LED
8. Stand-by key

## 2.2 Rear view

---

### Overview

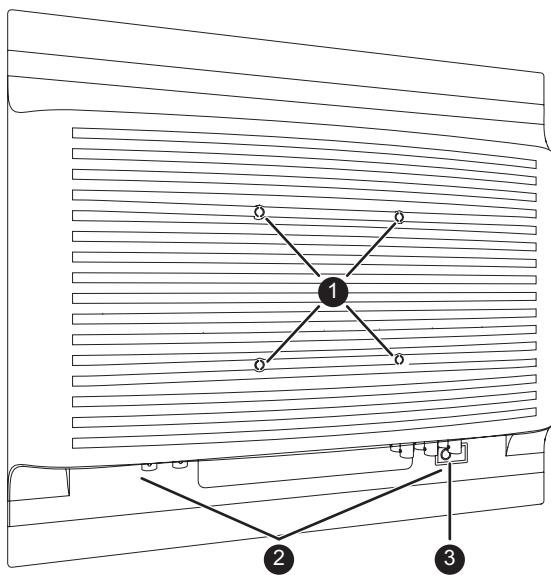


Image 2-2

1. VESA mount screw holes (100 x 100 mm)
2. Connector compartment
3. Protective earth pin

## 2.3 Connector view

---

### Overview

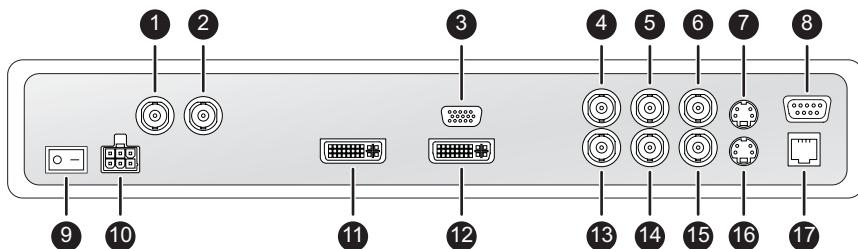


Image 2-3

1. SDI in
2. SDI out
3. VGA in
4. Sync
5. CVBS in
6. CVBS out
7. S-Video out
8. RS232
9. Power on/off switch
10. Power in
11. DVI out
12. DVI in
13. R/Pr

- 14. G/Y/SOG
- 15. B/Pb
- 16. S-Video in
- 17. Service

## 2.4 Connector pin assignments

### 2.4.1 Input power connector

#### Overview

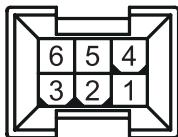


Image 2-4

1. GND
2. Not connected
3. +24 VDC
4. GND
5. Shield
6. +24 VDC



The ground and the shield connections on the power input connector have no Protective Earth function. A Protective Earth connection is provided via a dedicated pin (see "Rear view", page 6 ).

### 2.4.2 DVI connector (DVI-D)

#### Overview

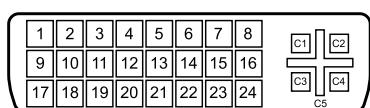


Image 2-5

1. D2\_Rx- (T.M.D.S.)
2. D2\_Rx+ (T.M.D.S.)
3. GND (data 2 shield)
4. Not connected
5. Not connected
6. SCL (for DDC)
7. SDA (for DDC)
8. Not connected
9. D1\_Rx- (T.M.D.S.)
10. D1\_Rx+ (T.M.D.S.)
11. GND (data 1 shield)
12. Not connected
13. Not connected
14. +5V output (\*)

15. GND (cable sense)
16. Hot plug detect (\*)
17. D0\_Rx- (T.M.D.S.)
18. D0\_Rx+ (T.M.D.S.)
19. GND (data 0 shield)
20. Not connected
21. Not connected
22. GND (clock shield)
23. CK\_Rx+ (T.M.D.S.)
24. CK\_Rx- (T.M.D.S.)

(\*) +5 VDC output selectable on either pin 14 or 16 via the OSD menu. (+5V ± 10% @ 500mA (max))

### 2.4.3 RS232 connector

#### Overview

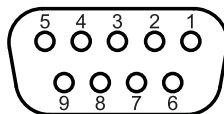


Image 2-6

1. Not connected
2. Rx (driven by host)
3. Tx (driven by display)
4. Not connected
5. Ground
6. Not connected
7. Not connected
8. Not connected
9. Not connected

### 2.4.4 S-Video and S-Video-out connector

#### Overview

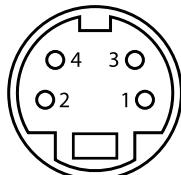


Image 2-7

1. Ground (Y)
2. Ground (C)
3. Luminance (Y)
4. Chroma (C)
5. SG: Shielded Ground

### 2.4.5 VGA connector

#### Overview

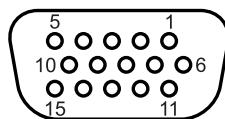


Image 2-8

1. R in
2. G in
3. B in
4. Ground
5. Not connected
6. Ground
7. Ground
8. Ground
9. Input power supply for DDC
10. Ground
11. Ground
12. SDA (for DDC option)
13. Horizontal sync in
14. Vertical sync in
15. SCL (for DDC option)

## *2. Parts, controls and connectors*

---

# 3. DISPLAY INSTALLATION

## 3.1 Interface connection

### About the interfaces

The E192HSA can have multiple video inputs connected. Switching between the different inputs can be done easily with the Source shortkey (→).

The Picture in Picture (PiP) and Side-by-Side (SbS) functionality becomes available if more than one video source is connected. This allows you to view two different video inputs at once. Please refer to the dedicated chapter for more info.

Beside video inputs, the E192HSA also has video output capabilities allowing you to loop-through certain video inputs to another display, projector, video recorder, ...

This chapter describes how to connect the different video interface types to the E192HSA.



**WARNING: To maintain compliance with EMC regulation, use only shielded interface cables for the connection to peripheral devices.**

### To connect the interfaces

1. Connect one or more video source(s) to the corresponding video inputs:

- ① : SDI
- ② : VGA
- ③ : CVBS
- ④ / ⑤ / ⑥ : R/G/B (SOG)
- ④ / ⑤ / ⑥ / ⑦ : R/G/B/S
- ⑤ / ⑥ / ④ : Y/Pb/Pr
- ⑧ : S-Video
- ⑨ : DVI

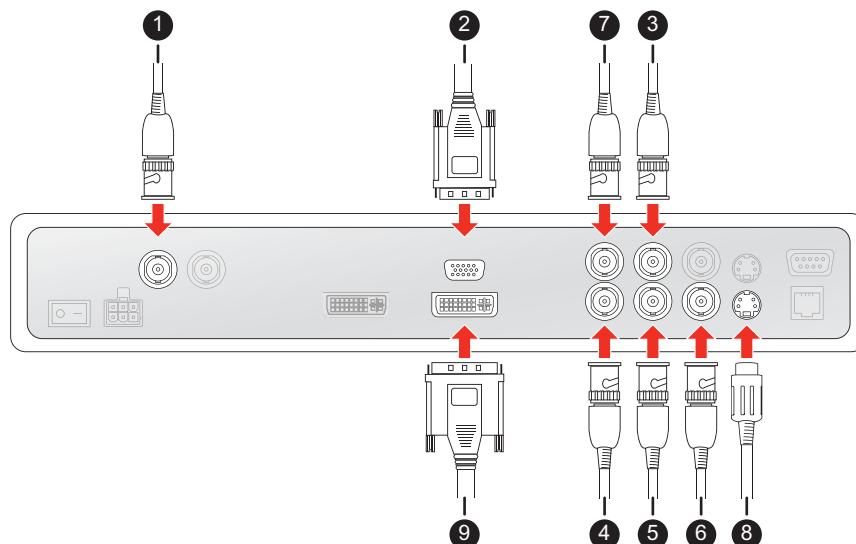


Image 3-1

2. Connect one or more of the available video sink(s) to the corresponding video outputs:

### 3. Display installation

---

- ① : SDI
- ② : DVI
- ③ : CVBS
- ④ : S-Video

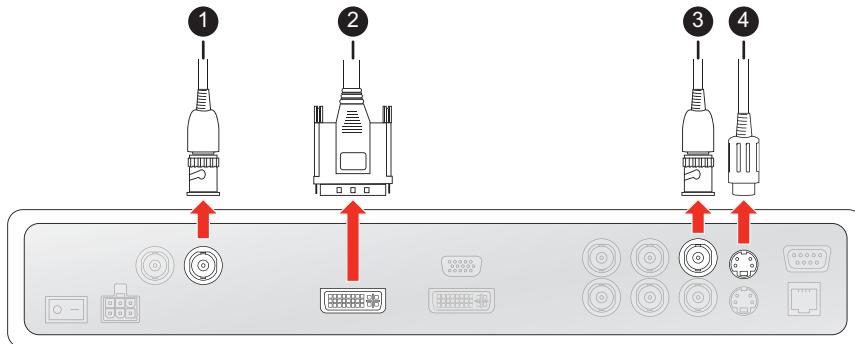


Image 3-2

## 3.2 Power supply connection

---

### To connect the power supply

1. Connect the supplied external DC power supply unit to the +24 VDC power input of your E192HSA display.
2. Plug the other end of the power supply into a **grounded** power outlet by means of the proper power cord delivered in the packaging.

**Warning:** *To avoid risk of electric shock, the external DC power supply must be connected to a mains with protective earth. The ground connection on the display's DC power input connector has no protective earth function. The E192HSA display protective earth connection is provided via a dedicate pin (see next steps).*



Image 3-3

### Protective earth

Earth the E192HSA by connecting the protective earth pin to a grounded outlet by means of an AWG18 wire (maximum admitted cable length according to national regulation requirements) and screw with lock washer M4x12 max.

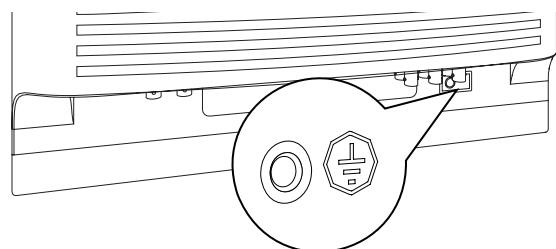


Image 3-4

### 3.3 VESA mount installation

---

#### To install the display on a VESA mounting solution

Attach the display to a VESA arm or stand (VESA 100 mm is supported) by making use of the included 4 screws (M4 x 25mm) and the dented washers.

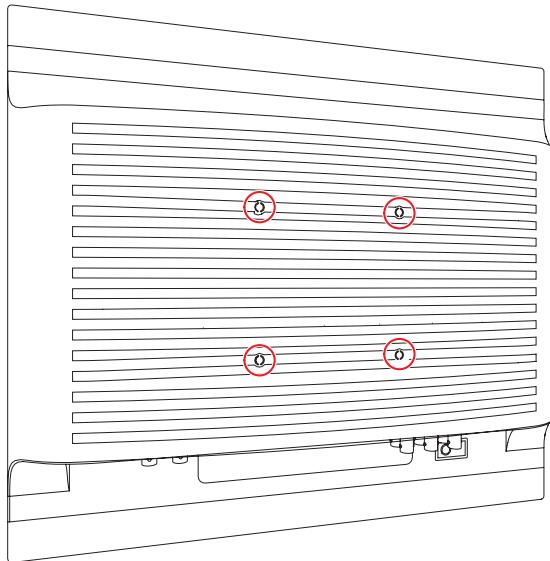


Image 3-5



**CAUTION:** The 4 screws included (M4 x 25 mm) can be used for a VESA arm interface with a thickness of up to 10 mm.

If, due to the thickness of the VESA arm interface (=V), the length of the provided screws (=L) is not suitable, consider the following rule:  $L = V + 15 \text{ mm}$

---



**CAUTION:** Use an arm that is in compliance with VESA requirements.

---



**CAUTION:** The monitor VESA interface has been designed for a safety factor 6 (to support 6 times the monitor weight). In the medical system, use an arm with suitable safety factor (IEC60601-1).

---

### *3. Display installation*

---

# 4. DAILY OPERATION

## 4.1 Power LED

### About

The behavior of the power LED shows the current status of the display:

LED behavior	Display mode
Off	Hard power OFF (rocker switch in position '0' or input power unplugged)
Steady orange	Soft power OFF (switched off by using the stand-by key (Ø ))
Steady green	Power ON and valid input signal.
Blinking orange	Power save mode (backlight and LCD off).
Blinking green	Power ON and searching for signal.  Note: When Power save mode is enabled, the display will automatically go into power save mode after 10 seconds of searching without signal.

## 4.2 On/Off switching

### To switch on your display:

1. Activate the input power by toggling the rocker switch at the back of the display to position '1'.
2. Press and hold the stand-by key Ø for approximately 3 seconds until the power LED turns green.

### To switch off your display:

1. While your display is switched on, press and hold the stand-by key Ø for approximately 3 seconds until the power LED turns orange.



The front key illumination will blink while pressing the stand-by key.



Toggle the rocker switch at the back of the display to position '0' to minimize power consumption.

## 4.3 Power save mode

### About

By default, the display will go into power save mode when no valid signal is present at the selected video input for more than 10 seconds. This will switch off the backlight and LCD and is indicated by a blinking orange power LED.

To exit power save mode and switch the display back on, shortly press the ☰ or ☱ key.



Power save mode can be disabled in the OSD menus. Please refer to "Power Saving", page 33.

---



The display does not accept any RS-232 commands when it is in power save mode.

---

## 4.4 OSD menu activation

---

### To activate the OSD menu

1. Press the **□** key while your display is powered on.
2. If the *OSD lock* window appears, press the following keyboard sequence to unlock the OSD menu: **◀, ▶, □**  
Each time a key is pressed an asterisk is shown in the square boxes.

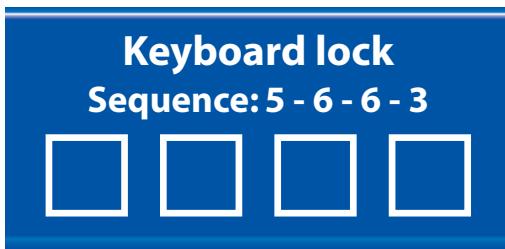


Image 4-1

The OSD main menu comes up in the bottom right corner of the screen. If no further actions are taken within the following 30 seconds, the OSD menu will disappear again.



The OSD lock function can be disabled to allow OSD menu access immediately from the **□** key without the need to enter the unlock sequence each time. Please refer to "Keyboard lock", page 32.

---



The OSD menu position and the time-out of the automatic close function can be adjusted in the OSD menu. Please refer to "OSD setting", page 30.

---

## 4.5 OSD menu navigation

---

### OSD menu structure explained

Below is an example of the OSD menu structure:

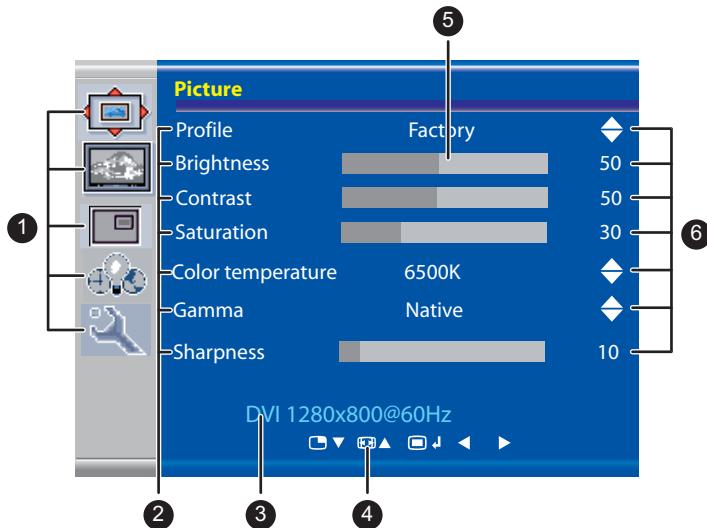


Image 4-2

1	Menu
2	Sub-menu
3	Status bar
4	Legend (shows the functionality associated to each keyboard key)
5	Selector/Slider
6	Item

### To navigate through the OSD menu



Image 4-3

- Press the key to open the OSD menu.
- Use the or key to scroll to the desired menu page.
- When the desired Menu page is highlighted, press the key to select the top menu item that will be highlighted.
- Use the or keys to move to other Menu Items, then press the key to select it.
- If the selected menu item is controlled by a slider use the or keys to adjust the item value, then press the key to confirm.
- If the selected menu item is a multiple choices menu use the or keys to select the desired option then press the key to confirm.
- Press again or key to select other Menu items or exit from the Menu page by pressing the key.

## 4.6 Shortkey functions

### About shortkey functions

The concept of shortkey functions is to present a selection of commonly used functions immediately available without the need to navigate through the OSD Menu.

The different available shortkey functions are:

- Main source selection
- Multi-image configuration
- Zoom factor selection
- Brightness adjustment
- Picture swap

### Overview of shortkeys

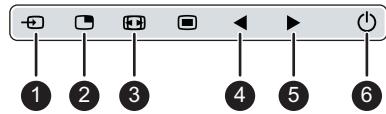


Image 4-4

1	Main source selection
2	Multi-image configuration
3	Zoom factor selection
4	Brightness decrease
5	Brightness increase
6	Picture swap

#### 4.6.1 Main source selection

##### To quickly select the main source

1. Use the Input selection key (1) to scroll through all the possible input signals to select the main input source.

#### 4.6.2 Multi-image configuration

##### To quickly select the multi-image configuration

1. Use the PiP selection key (2) to scroll through all possible configurations of Picture-in-Picture (PiP) and Side-by-Side (SbS).  
The different PiP/SbS options are:
  - Small PiP: 30% of Primary height in top-right corner
  - Large PiP: 50% of Primary height in top-right corner
  - Side-by-Side: Primary and Secondary input of equal height



**Only a subset of multi-image configuration settings is available via this shortkey function. More multi-image configuration settings can be selected in the OSD menus.**

---

#### 4.6.3 Zoom factor selection

##### To quickly select the zoom factor

1. Use the Image zoom key (3) to select one of the available zoom factors.

#### 4.6.4 Brightness adjustment

##### To quickly adjust the brightness

1. While no OSD Menu is on the screen, press the Brightness decrease (4) or Brightness increase (5) keys to adjust the brightness as desired.

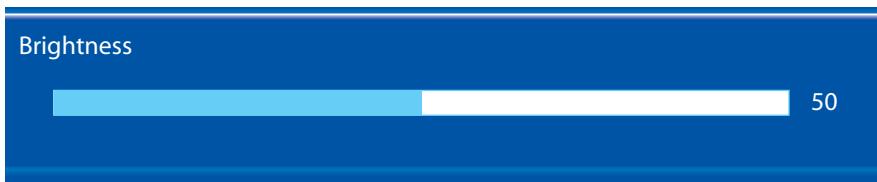


Image 4-5

#### 4.6.5 Picture swap

##### About picture swap

Picture swap allows you to quickly change between main and second input source.

##### To quickly swap the picture

1. While no OSD menu is on the screen, shortly press the Standby key (Ø). The display will swap main and second input sources, depending on the current input source.

*4. Daily operation*

---

# 5. ADVANCED OPERATION

## 5.1 OSD picture menu

### Overview

- Profile
- Brightness
- Contrast
- Saturation
- Color temperature
- Gamma
- Sharpness

### 5.1.1 Profile

#### About profiles

To select a profile means to load a set of predefined video parameters like Brightness, Contrast, Saturation, Input selection (Primary & Secondary), Multi-image layout selection, etc.

The user can modify the default video parameters associated to each profile and save the new parameters setting under the User 1, User 2 or User 3 profile. The Factory and X Ray profiles can be temporarily modified, but the factory default can't be overwritten and can always be recalled through the recall profile menu item.

The available profiles for your display are:

- Factory
- X Ray
- User 1
- User 2
- User 3

#### To select a profile

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Profile* submenu.
4. Select one of the available profiles and confirm.

### 5.1.2 Brightness

#### To adjust the brightness level

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Brightness* submenu.  
The command bar *Brightness* is highlighted.
4. Set the brightness level as desired and confirm.



**The brightness level can also be adjusted through a shortkey function.**

---



**Brightness level is adjusted by controlling the backlight illumination only.**

---

### 5.1.3 Contrast

#### To adjust the contrast level

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Contrast* submenu.  
The command bar *Contrast* is highlighted.
4. Set the contrast level as desired and confirm.

### 5.1.4 Saturation

#### To adjust the saturation level

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Saturation* submenu.  
The command bar *Saturation* is highlighted.
4. Set the saturation level as desired and confirm.

### 5.1.5 Color temperature

#### About color temperature presets

The available color temperature presets for your display are:

- 5600K
- 6500K
- 7600K
- 9300K
- Native
- User



**When color temperature 5600K, 6500K, 7600K or 9300K are selected only the white color point is adjusted.**

---

#### To select a color temperature preset

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Color Temperature* submenu.

---

4. Select one of the available color temperature presets and confirm.

**Note:** If you selected the User color temperature preset, a new menu will be displayed allowing you to manually adjust the gain and offset of red, green and blue.

### 5.1.6 Gamma

#### About gamma presets

The available gamma presets for your display are:

- CRT (the display follows the response curve of a CRT)
- Native (no correction curve is applied)
- X-ray (grayscale levels are mapped according to the DICOM curve in an approximate way)

#### To select a gamma preset

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Gamma* submenu.
4. Select one of the available gamma presets and confirm.

### 5.1.7 Sharpness

#### To adjust the sharpness level

1. Bring up the OSD main menu.
2. Navigate to the *Picture* menu.
3. Enter the *Sharpness* submenu.  
The command bar *Sharpness* is highlighted.
4. Set the sharpness level as desired and confirm.

## 5.2 Picture Advanced menu

---

### Overview

- Black Level
- Smart Video
- Image Position
- Auto Adjustment
- Phase
- Clock/Line

### 5.2.1 Black Level

#### About black level

This command allows to add or subtract an offset to the input video signal (available only on video formats).

#### To adjust the black level

1. Bring up the OSD main menu.
2. Navigate to the *Picture advanced* menu.
3. Enter the *Black Level* submenu.  
The command bar *Black Level* is highlighted.

4. Set the black level as desired and confirm.

### 5.2.2 Smart Video

#### About Smart Video

This function allows to reduce the video latency in the monitor if its frame rate is in the range of 50 - 60 Hz. To achieve a minimum latency select one of the surgical modes.

The available Smart Video presets for your display are:

- Diagnostic (best picture quality)
- Surgical (low latency, recommended for real-time intervention)
- Surgical 1 (low latency, optimized for fast moving images)

#### To select a Smart Video preset

1. Bring up the OSD main menu.
2. Navigate to the *Picture advanced* menu.
3. Enter the *Smart Video* submenu.
4. Select one of the available Smart Video presets and confirm.

### 5.2.3 Image Position

---



**This menu item is only available when VGA input is connected.**

#### To adjust the image position

1. Bring up the OSD main menu.
2. Navigate to the *Picture advanced* menu.
3. Enter the *Image Position* submenu.  
A small OSD menu will be activated indicating the horizontal and vertical image position offset.
4. Use the **■** and **□** keys to move the picture up and down.
5. Use the **◀** and **▶** keys to move the picture left and right.
6. When finished, use the **■** key to exit from the small OSD menu.

### 5.2.4 Auto Adjustment

---



**This menu item is only available when VGA input is connected.**

#### About auto adjustment

When auto adjustment is activated, the phase and clock per line parameters are automatically adjusted.

#### To activate auto adjustment

1. Bring up the OSD main menu.
2. Navigate to the *Picture advanced* menu.
3. Enter the *Auto Adjustment* submenu.

The automatic picture adjustment is activated: the phase and clock per line parameters are automatically adjusted.

### 5.2.5 Phase

---



This menu item is only available when VGA input is connected.

---

#### About phase

If the result of the Auto Adjustment procedure described above isn't satisfactory, the Phase can be manually adjusted by following this procedure.

#### To manually adjust the phase

1. Bring up the OSD main menu.
2. Navigate to the *Picture advanced* menu.
3. Enter the *Phase* submenu.  
The command bar *Phase* is highlighted.
4. Set the phase as desired and confirm.

### 5.2.6 Clock/Line

---



This menu item is only available when VGA input is connected.

---

#### About clock/line

If the result of the Auto Adjustment procedure described above isn't satisfactory, the Clock/Line can be manually adjusted by following this procedure.

#### To manually adjust the phase

1. Bring up the OSD main menu.
2. Navigate to the *Picture advanced* menu.
3. Enter the *Clock/Line* submenu.  
The command bar *Clock/Line* is highlighted.
4. Set the clock/line as desired and confirm.

## 5.3 Display Format menu

---

### Overview

- Main Source (Primary Source)
- Component Mode
- Zoom
- Image Size
- 2<sup>nd</sup> Picture Mode
- 2<sup>nd</sup> Picture Source
- 2<sup>nd</sup> Picture Position

- Picture Swap

### 5.3.1 Main Source (Primary Source)

#### About main sources

The available main sources for your display are:

- Auto Search
- Composite
- S-Video
- Component
- PC Analog
- DVI 1
- SDI 1



**The main source can also be selected through a shortkey function.**

---

#### To select the main source

1. Bring up the OSD main menu.
2. Navigate to the *Display Format* menu.
3. Enter the *Main Source* submenu.
4. Select one of the available main source and confirm.

*Note: If you selected the Auto Search preset, the display will automatically detect the connected signal.*

### 5.3.2 Component Mode

#### About component modes

The available component modes for your display are:

- YPbPr
- RGB

#### To select the component mode

1. Bring up the OSD main menu.
2. Navigate to the *Display Format* menu.
3. Enter the *Component Mode* submenu.
4. Select one of the available component modes and confirm.

### 5.3.3 Zoom

#### About zoom

The available zoom factors for your display are:

- None
- 10%
- 20%
- 30%
- 40%
- 50%



The zoom factor can also be selected through a shortkey function.

### To select a zoom factor

1. Bring up the OSD main menu.
2. Navigate to the *Display Format* menu.
3. Enter the *Zoom* submenu.
4. Select one of the available zoom factors and confirm.

### 5.3.4 Image Size

#### About image size

The available image sizes for your display are:

- Full Screen (fill the screen, image aspect-ratio can be altered)
- Aspect (fill the screen on largest dimension, no modification in image aspect-ratio)
- Native (input pixel to LCD pixel mapping, no scaling)



In Aspect and Native, the image may be displayed with black bars on top/bottom or left/right.

### To select the image size

1. Bring up the OSD main menu.
2. Navigate to the *Display Format* menu.
3. Enter the *Image Size* submenu.
4. Select one of the available image sizes and confirm.

### 5.3.5 2<sup>nd</sup> Picture Mode

#### About 2<sup>nd</sup> picture modes

The available 2<sup>nd</sup> picture modes for your display are:

- Off
- Small PiP: 30% of Primary height in top-right corner
- Large PiP: 50% of Primary height in top-right corner
- Side-by-Side: Primary and Secondary input of equal height
- S.b.S. Native: The 2 images are displayed with input pixel to LCD pixel mapping, with image crop if necessary
- S.b.S. Fill: Both images scaled to fill half of the screen, with image crop if necessary

### To select the 2<sup>nd</sup> picture mode

1. Bring up the OSD main menu.
2. Navigate to the *Display Format* menu.
3. Enter the *2<sup>nd</sup> Picture Mode* submenu.
4. Select one of the available 2<sup>nd</sup> picture modes and confirm.



**Multi image in Full HD available with any combination of input sources.**

**Multi image in SD video available with any combination of input source except Composite & S-video.**

---

### 5.3.6 2<sup>nd</sup> Picture Source

#### About 2<sup>nd</sup> picture sources

The available 2<sup>nd</sup> picture sources for your display are:

- Auto Search
- Composite
- S-Video
- Component
- PC Analog
- DVI 1
- SDI 1



**The combinations Composite and S-Video as main and 2<sup>nd</sup> picture source and vice versa are not allowed.**

---



**Independent Transfer Function:**

**Gamma and Color temperature for the 2nd Picture Source are always set to Native and 6500K independently from the Transfer Function applied to the Main Picture Source. This allows a perfect visualization of a DICOM-like image as Main picture and a Video image as 2nd picture.**

---

#### To select the 2<sup>nd</sup> picture source

1. Bring up the OSD main menu.
2. Navigate to the *Display Format* menu.
3. Enter the *2<sup>nd</sup> Picture Source* submenu.
4. Select one of the available 2<sup>nd</sup> picture sources and confirm.

### 5.3.7 2<sup>nd</sup> Picture Position

#### About 2<sup>nd</sup> picture positions

The available 2<sup>nd</sup> picture positions for your display are:

- Top Right
- Top Left
- Bottom Right
- Bottom Left

### To select the 2<sup>nd</sup> picture position

1. Bring up the OSD main menu.
2. Navigate to the *Display Format* menu.
3. Enter the *2<sup>nd</sup> Picture Position* submenu.
4. Select one of the available 2<sup>nd</sup> picture positions and confirm.

## 5.3.8 Picture Swap

### About picture swapping

To swap pictures means to exchange (swap) main and 2<sup>nd</sup> picture.

### To swap pictures

1. Bring up the OSD main menu.
2. Navigate to the *Display Format* menu.
3. Enter the *Picture Swap* submenu.
4. Select the desired setting and confirm.

## 5.4 Configuration menu

### Overview

- Information
- Language
- OSD setting
- Recall Profile
- Save Profile

## 5.4.1 Information

### About information

The available information items for your display are:

- Model (commercial type identification)
- Operating Hours (backlight operation hours)
- Firmware Release (firmware identification)
- Hardware Version (main board identification)
- Option SDI (SDI module identification)
- Serial Number: ANxxxxxxxxxxxx

### To access information

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *Information* submenu.

The different information items are shown.

### 5.4.2 Language

#### About languages

The available languages for your display OSD menu are:

- English
- Français
- Deutsch
- Español
- Italiano

#### To select the language

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *Language* submenu.
4. Select one of the available languages and confirm.

### 5.4.3 OSD setting

#### 5.4.3.1 OSD Horizontal Position

##### To adjust the OSD horizontal position

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *OSD setting* submenu.
4. Select *OSD Hor. Pos.*  
The command bar *OSD Hor. Pos.* is highlighted.
5. Set the OSD horizontal position as desired and confirm.

#### 5.4.3.2 OSD Vertical Position

##### To adjust the OSD vertical position

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *OSD setting* submenu.
4. Select *OSD Ver. Pos.*  
The command bar *OSD Ver. Pos.* is highlighted.
5. Set the OSD vertical position as desired and confirm.

#### 5.4.3.3 OSD Time-out

##### About OSD time-out

The OSD menu can automatically close after a certain time of inactivity after the last selection was made.

The available OSD time-out values for your display are:

- 10 Sec.
- 20 Sec.
- 30 Sec.
- 60 Sec.
- Disabled (=5 minutes)

### To adjust the OSD time-out

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *OSD setting* submenu.
4. Select *OSD Time-out*
5. Select one of the available OSD time-out values and confirm.

#### 5.4.4 Recall Profile

##### About recalling profiles

To recall a profile means to restore the default factory settings (Factory and X Ray profiles) or recall the user defined profiles.

The available profiles to recall from your display are:

- Factory
- X Ray
- User 1
- User 2
- User 3

##### To recall a profile

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *Recall Profile* submenu.
4. Select one of the available profiles to recall and confirm.

#### 5.4.5 Save Profile

##### About saving profiles

The user can modify the default video parameters associated to each profile and save the new parameter settings under the User 1, User 2 or User 3 profile. The Factory and X Ray profiles can be modified, but the factory default can't be overwritten and can always be recalled through the recall profile menu item.

The available profiles to save in your display are:

- User 1
- User 2
- User 3

##### To save a profile

1. Bring up the OSD main menu.
2. Navigate to the *Configuration* menu.
3. Enter the *Save Profile* submenu.
4. Select one of the available profiles to save and confirm.

## 5.5 System menu

---

### Overview

- Power on DVI 1
- DVI Output
- Keyboard lock
- Power Saving

#### 5.5.1 Power on DVI 1

##### About power on DVI 1

This setting allows you to select the pin of DVI port 1 connector on which the +5V DC supply is applied.

The available options are:

- Disabled
- +5V on Pin 14
- +5V on Pin 16

##### To select the power on DVI 1

1. Bring up the OSD main menu.
2. Navigate to the *System* menu.
3. Enter the *Power on DVI 1* submenu.
4. Select one of the available options and confirm.

#### 5.5.2 DVI Output

##### About DVI output

This setting allows you to select which digital input to replicate on DVI out.

The available options are:

- DVI 1
- None



**This feature is subject to restrictions in case of Multi-image (PiP, SbS).**

---

##### To select the DVI output

1. Bring up the OSD main menu.
2. Navigate to the *System* menu.
3. Enter the *DVI output* submenu.
4. Select one of the available options and confirm.

#### 5.5.3 Keyboard lock

##### About keyboard locking

This setting allows you to disable the keyboard functionality and avoid unwanted access to the OSD functions.

Accessing the OSD menu is only possible after pressing a sequence of keys. Please refer to the dedicated section for more details (Keyboard locking/unlocking).

### To enable/disable keyboard locking

1. Bring up the OSD main menu.
2. Navigate to the *System* menu.
3. Enter the *Keyboard Lock* submenu.
4. Enable/Disable keyboard locking as desired and confirm.

#### 5.5.4 Power Saving

##### About power saving

When the active input(s) is (are) missing, this setting allows the display to switch off the backlight and enter a low power mode. In this status the availability of the selected input is checked periodically.



When the unit is in power save mode, the unit can exit this power save mode in two cases:

1. When a signal is applied on the selected input (or any input in case of auto).
2. By activating the OSD menu, see "OSD menu activation", page 16.

---

### To enable/disable power saving

1. Bring up the OSD main menu.
2. Navigate to the *System* menu.
3. Enter the *Power Saving* submenu.
4. Enable/Disable power saving as desired and confirm.



# 6. IMPORTANT INFORMATION

## 6.1 Safety information

---

### General recommendations

Read the safety and operating instructions before operating the device.

Retain safety and operating instructions for future reference.

Adhere to all warnings on the device and in the operating instructions manual.

Follow all instructions for operation and use.

### Electrical Shock or Fire Hazard

To prevent electric shock or fire hazard, do not remove cover.

No serviceable parts inside. Refer servicing to qualified personnel.

Do not expose this apparatus to rain or moisture.

### Modifications to the unit:

Do not modify this equipment without authorization of the manufacturer.

### Preventive maintenance

Performance of preventive maintenance is not essential. Periodic maintenance inspections are essential to keep the monitor in optimum condition and ensure safe operation. We recommend a functional and safety test of the monitor at regular intervals (e.g. at least once a year).

### Type of protection (Electrical)

Equipment with external power supply: Class I equipment

### Degree of safety (flammable anesthetic mixture):

Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

### Non-patient care equipment

- Equipment primarily for use in a health care facility that is intended for use where contact with a patient is unlikely (no applied part).
- The equipment may not be used with life support equipment.
- The user should not touch the equipment, nor its signal input ports (SIP)/signal output ports (SOP) and the patient at the same time.

### Mission critical applications

We strongly recommend there is a replacement display immediately available in mission critical applications.

### Use of Electrical Surgical Knives

Provide as much distance as possible between the electrosurgical generator and other electronic equipment (such as monitors). An activated electrosurgical generator may cause interference with them. The interference can activate the OSD menu of the display and as such disrupt the functionality of the display.

### Power connection – Equipment with external 24 VDC power supply

- Power requirements: The equipment must be powered using the delivered medical approved 24 VDC (—) SELV power supply.
- The medical approved DC (—) power supply must be powered by the AC mains voltage.
- The power supply is specified as a part of the ME equipment or combination is specified as a ME system.
- To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.
- The equipment should be installed near an easily accessible outlet.
- The equipment is intended for continuous operation.

### Power cords:

- Europe: H05VV-F or H05VVH2-F PVC cord with appropriate EU plug.  
US and Canada: "hospital grade" cord-set has to be used, provided with instructions to indicate that grounding reliability can be achieved only when the equipment is connected to an equivalent receptacle marked hospital only or hospital grade. These instructions need to be marked either on the equipment or on a tag on the power cord.
- Do not overload wall outlets and extension cords as this may result in fire or electric shock.
- Mains lead protection (U.S.: Power cord): Power cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs and receptacles.
- Use a power cord that matches the voltage of the power outlet, which has been approved and complies with the safety standard of your particular country.

### Transient over-voltage

If the device is not used for a long time, disconnect it from the AC inlet to avoid damage by transient over-voltage.

To fully disengage the power to the device, please disconnect the power cord from the AC inlet.

### Connections

Any external connection with other peripherals must follow the requirements of clause 16 of IEC60601-1 3rd ed. or Table BBB.201 of IEC 60601-1-1 for the medical electrical systems.

### Water and moisture

The equipment is IP21 compliant. The monitor front side only is IPx5 compliant.



**The external power supply is approved for IPx0. The power supply must be mounted in a flat position for best resistance to fluids.**

---

### Ventilation

Do not cover or block any ventilation openings in the cover of the set. When installing the device in a cupboard or another enclosed location, heed the necessary space between the set and the sides of the cupboard.

## Installation

- Place the equipment on a flat, solid and stable surface that can support the weight of at least 3 units. If you use an unstable cart or stand, the equipment may fall, causing serious injury to a child or adult, and serious damage to the equipment.
- Do not allow to climb or rest on the equipment.
- When adjusting the angle of the equipment, move it slowly so as to prevent the equipment from moving from or slipping off its stand or arm.
- When the equipment is attached to an arm, do not use the equipment as a handle or grip in order to move the equipment. Please refer to the instruction manual of the arm for instructions on how to move the arm with the equipment.
- Provide full attention to safety during installation, periodic maintenance and examination of this equipment.
- Sufficient expertise is required for installing this equipment, especially to determine the strength of the wall, arm or ceiling suspension for withstanding the display's weight. Be sure to entrust the attachment of this equipment to the wall to a duly skilled technician and pay adequate attention to safety during the installation and usage.
- The manufacturer is not liable for any damage or injury caused by mishandling or improper installation.

## General warnings

- All devices and complete setup must be tested and validated before taking into operation.
- At end user application level it is necessary to foresee a backup unit in case the monitor fails.

## Technical data

- The monitor is intended for indoor use
- The monitor has been designed to be used in landscape position with a tilt of -10° backward and +10° forward.
- Class I Equipment, according to the type of protection against electric shock
- The monitor is not intended to be sterilized
- The monitor has no applied parts. The front side of the monitor and the plastic enclosure have been treated as applied parts however, because they may accidentally be touched by the patient for a time <1 minute.
- The compliance of this display with Medical Safety and EMC requirements has been evaluated using the external (optional) medical power supply Skynet model 'BAR-A159'. If a different power supply will be used, further investigation for Safety and EMC requirements have to be performed at system level.
- The enclosure has to be checked upon collision damage, refer to qualified service personnel.

## This apparatus conforms to:

- MDD 93/42/EEC (Class1), Amended by 2007/47/EC
- EN 60601-1 3rd Edition (2006) - Medical Electrical Equipment / General Requirements for basic Safety and essential performance
- IEC 60601-1 3rd Edition (2005) - Medical Electrical Equipment / General Requirements for basic Safety and essential performance
- ANSI/AAMI ES60601-1 3rd Edition (2005) - Medical Electrical Equipment / General Requirements for basic Safety
- CAN/CSA-C22.2 No. 60601-1 (2008) - Medical Electrical Equipment - Part 1: General Requirements for basic Safety and Essential Performance
- CE c-UL-us, DEMKO, PSE (available on PSU), CCC
- EMC Medical EMC Standards: IEC/EN 60601-1-2 (2007), EN55011/CISPR 11 (Class B), FCC CFR47 part 15 & 18
- RoHS-2, REACH, WEEE compliant

### National Scandinavian Deviations for CL. 1.7.2:

Finland: "Laite on liitettävä suojaamaadoituskoskettimilla varustettuun pistorasiaan"

Norway: "Apparatet må tilkoples jordet stikkontakt"

Sweden: "Apparaten skall anslutas till jordat uttag"

## 6.2 Environmental information

---

### Disposal Information

Waste Electrical and Electronic Equipment



■ This symbol on the product indicates that, under the European Directive 2012/19/EU governing waste from electrical and electronic equipment, this product must not be disposed of with other municipal waste. Please dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

For more information about recycling of this product, please contact your local city office or your municipal waste disposal service.

For details, please visit the Barco website at: <http://www.barco.com/en/AboutBarco/weee>

### Turkey RoHS compliance



■ Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur.

[Republic of Turkey: In conformity with the WEEE Regulation]

### 中国大陆 ROHS (Chinese Mainland RoHS)

根据中国大陆《电子信息产品污染控制管理办法》(也称为中国大陆RoHS)，以下部分列出了Barco产品中可能包含的有毒和/或有害物质的名称和含量。中国大陆RoHS指令包含在中国信息产业部 MCV 标准：“电子信息产品中有毒物质的限量要求”中。

According to the "China Administration on Control of Pollution Caused by Electronic Information Products" (Also called RoHS of Chinese Mainland), the table below lists the names and contents of toxic and/or hazardous substances that Barco's product may contain. The RoHS of Chinese Mainland is included in the MCV standard of the Ministry of Information Industry of China, in the section "Limit Requirements of toxic substances in Electronic Information Products".

零件项目(名称) Component name	有毒有害物质或元素 Hazardous substances and elements					
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr6+	多溴联苯 PBB	多溴二苯醚 PBDE
印制电路配件 Printed Circuit Assemblies	X	O	O	O	O	O
液晶面板 LCD panel	X	O	O	O	O	O

零件项目(名称) Component name	有毒有害物质或元素 Hazardous substances and elements					
	铅 Pb	汞 Hg	镉 Cd	六价铬 Cr6+	多溴联苯 PBB	多溴二苯 醚 PBDE
外接电(线)缆 External Cables	X	O	O	O	O	O
内部线路 Internal wiring	X	O	O	O	O	O
金属外壳 Metal enclosure	O	O	O	O	O	O
塑胶外壳 Plastic enclosure	O	O	O	O	O	O
散热片(器) Heatsinks	O	O	O	O	O	O
风扇 Fan	X	O	O	O	O	O
电源供应器 Power Supply Unit	X	O	O	O	O	O
文件说明书 Paper Manuals	O	O	O	O	O	O
光盘说明书 CD manual	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/T 11363-2006 标准规定的限量要求以下。  
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: 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/T 11363-2006 标准规定的限量要求。  
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

在中国大陆销售的相应电子信息产品(EIP)都必须遵照中国大陆《电子信息产品污染控制标识要求》标准贴上环保使用期限(EFUP)标签。Barco产品所采用的EFUP标签(请参阅实例, 徽标内部的编号使用于制定产品)基于中国大陆的《电子信息产品环保使用期限通则》标准。

All Electronic Information Products (EIP) that are sold within Chinese Mainland must comply with the "Electronic Information Products Pollution Control Labeling Standard" of Chinese Mainland, marked with the Environmental Friendly Use Period (EFUP) logo. The number inside the EFUP logo that Barco uses (please refer to the photo) is based on the "Standard of Electronic Information Products Environmental Friendly Use Period" of Chinese Mainland.



Image 6-1

## RoHS

Directive 2011/65/EC on the restriction of certain hazardous substances in electrical and electronic equipment.

According to what declared by our components suppliers, this product is RoHS compliant.

## 6.3 Biological hazard and returns

---

### Overview

The structure and the specifications of this device as well as the materials used for manufacturing makes it easy to wipe and clean and therefore suitable to be used for various applications in hospitals and other medical environments, where procedures for frequent cleaning are specified.

However, normal use shall exclude biological contaminated environments, to prevent spreading of infections.

Therefore use of this device in such environments is at the exclusive risk of Customer. In case this device is used where potential biological contamination cannot be excluded.

Customer shall implement the decontamination process as defined in the latest edition of the ANSI/AAMI ST35 standard on each single failed Product that is returned for servicing, repair, reworking or failure investigation to Seller (or to the Authorized Service Provider). At least one adhesive yellow label shall be attached on the top site of the package of returned Product and accompanied by a declaration statement proving the Product has been successfully decontaminated.

Returned Products that are not provided with such external decontamination label, and/or whenever such declaration is missing, can be rejected by Seller (or by the Authorized Service Provider) and shipped back at Customer expenses.

## 6.4 Regulatory compliance information

---

### Indications for use

This device is intended to be used in operation rooms, to display images from endoscopic cameras, room and boom cameras, ultrasound, cardiology, PACS, anesthesiology and patient information. It is not intended for diagnosis.

### FCC class B

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

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

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

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

### Canadian notice

This ISM device complies with Canadian ICES-001.

Cet appareil ISM est conforme à la norme NMB-001 du Canada.

## 6.5 Cleaning and disinfection

### Instructions

- Be sure to unplug the power cord from the mains when cleaning your LCD monitor.
- Take care not to scratch the front surface with any hard or abrasive material.
- Dust, finger marks, grease etc. can be removed with a soft damp cloth (a small amount of mild detergent can be used on the damp cloth).
- Wipe off water drop immediately.

### Possible cleaning solutions

- 250 ppm chlorine solution
- NaCl solution 0.9% – Sodium chloride 00-236
- Bacillol AF
- 1.6 percent aqueous ammonia
- Cidex® (2.4 percent glutaraldehyde solution)
- Sodium hypochlorite (bleach) 10 percent
- “Green soap” (USP)
- Like Cleansafe® optical cleaning liquid
- Isopropanol
- Haemosol solution (1% in 1 liter water)
- Chlorehexidine 0,5% in 70% Ethanol

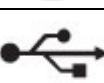
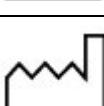
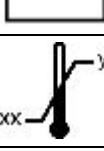
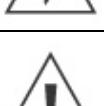
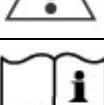
## 6.6 Explanation of symbols

### Symbols on the device

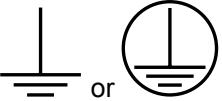
On the device or power supply, you may find the following symbols (nonrestrictive list):

	Indicates the device meets the requirements of the applicable EC directives.
	Indicates compliance with Part 15 of the FCC rules (Class A or Class B)
	Indicates the device is approved according to the UL Recognition regulations
	Indicates the device is approved according to the UL regulations for Canada and US
	Indicates the device is approved according to the UL Demko regulations
	Indicates the device is approved according to the CCC regulations

## 6. Important information

	Indicates the device is approved according to the VCCI regulations
	Indicates the device is approved according to the KC regulations
	Indicates the device is approved according to the BSMI regulations
	Indicates the device is approved according to the PSE regulations
	Indicates the USB connectors on the device
	Indicates the DisplayPort connectors on the device
	Indicates the legal manufacturer
	Indicates the manufacturing date
	Indicates the temperature limitations <sup>1</sup> for the device to safely operate within specs.
	Indicates the device serial number
	Indicates the device part number or catalogue number
	<b>Warning:</b> dangerous voltage
	<b>Caution</b>
	Consult the operating instructions

1. Values for xx and yy can be found in the technical specifications paragraph.

	Indicates this device must not be thrown in the trash but must be recycled, according to the European WEEE (Waste Electrical and Electronic Equipment) directive
	Indicates Direct Current (DC)
	Indicates Alternating Current (AC)
	Stand-by
	Equipotentiality
 or 	Protective earth (ground)

## 6.7 Legal disclaimer

### Disclaimer notice

Although every attempt has been made to achieve technical accuracy in this document, we assume no responsibility for errors that may be found. Our goal is to provide you with the most accurate and usable documentation possible; if you discover errors, please let us know.

Barco software products are the property of Barco. They are distributed under copyright by Barco NV or Barco Inc., for use only under the specific terms of a software license agreement between Barco NV or Barco Inc. and the licensee. No other use, duplication, or disclosure of a Barco software product, in any form, is authorized.

The specifications of Barco products are subject to change without notice.

### Trademarks

All trademarks and registered trademarks are property of their respective owners.

### Copyright notice

This document is copyrighted. All rights are reserved. Neither this document, nor any part of it, may be reproduced or copied in any form or by any means - graphical, electronic, or mechanical including photocopying, taping or information storage and retrieval systems - without written permission of Barco.

© 2015 Barco NV all rights reserved.

## 6.8 Technical specifications

### Overview

Screen technology	TFT AM LCD White LED backlight
Active screen size (diagonal)	19.0" (481.84 mm)

## 6. Important information

<b>Active screen size (H x V)</b>	376 x 302 mm (14.8" x 11.89")
<b>Aspect ratio</b>	5:4
<b>Resolution</b>	1MP (1280 x 1024)
<b>Pixel pitch</b>	0.294mm
<b>Color imaging</b>	Yes
<b>Color support</b>	16.7 million (8-bit)
<b>Viewing angle</b>	178°
<b>Luminance</b>	Default @6500K: 250 cd/m <sup>2</sup> Maximum: 300 cd/m <sup>2</sup> (typical)
<b>Contrast ratio</b>	900:1 (typical)
<b>LCD transition time</b>	Average total 18ms typical (Rise time Tr + Decay time Tf; Tr = Black to White , Tf = White to Black)
<b>White point</b>	Native: 6400K Calibrated: 5600K, 6500K, 7600K, 9300K
<b>Dot clock</b>	165 MHz (maximum)
<b>Gamma</b>	Native, CRT, Xray
<b>Screen protection</b>	Dual side anti-reflective Acrylic
<b>Keyboard</b>	Mechanical membrane 7 buttons
<b>Video input signals</b>	<ul style="list-style-type: none"> <li>DVI-D Single Link (Digital – HDMI video support with HDCP)</li> <li>VGA</li> <li>Component Video RGBS / YPbPr (4xBNC)</li> <li>S-video (4-pin Mini DIN)</li> <li>Composite video (1xBNC)</li> <li>3G-SDI (1xBNC)</li> </ul>
<b>Video output signals</b>	<ul style="list-style-type: none"> <li>DVI-D (output selectable from DVI-1)</li> <li>S-video (4-pin Mini DIN)</li> <li>Composite video (1xBNC)</li> <li>3G-SDI (1xBNC)</li> </ul>
<b>Video formats</b>	<p>VGA &amp; DVI : Up to 1920x1200 at 60Hz (reduced blanking)</p> <ul style="list-style-type: none"> <li>Maximum Hor freq: 90kHz</li> <li>Maximum pixel clock: 165MHz</li> <li>Maximum Ver freq: 75Hz</li> </ul> <p>Standard PAL and NTSC for S-Video, Composite and Component</p> <p>Component YPbPr/ RGBS: HDTV - up to 1080i &amp; 1080p</p> <p>SDI Format Supported: 625/25 PAL, 525/29.97 NTSC, 1080i50, 1080i59.94, 1080i60, 720p50, 720p59.94, 720p60, 1080p50, 1080p59.94, 1080p60</p> <p>SDI Compliance: SMPTE 425M (Level A), SMPTE 424M, SMPTE 292M, SMPTE 259M-C, SMPTE 296M, ITU-R BT.656, ITU-R BT.601</p>
<b>Remote control</b>	RS-232 (D-sub 9-pin)
<b>Power requirements (nominal)</b>	External power supply: 100-240VAC, 50/60Hz, medical grade Display power input: +24 VDC ±10% / 1.3 A

<b>Power consumption (nominal)</b>	35W typical
<b>OSD languages</b>	English, French, German, Spanish, Italian
<b>Dimensions display (W x H x D)</b>	425 x 375 x 96.8 mm (16.7" x 18.6" x 3.6")
<b>Dimensions packaged (W x H x D)</b>	593 x 483 x 192 mm (23.3" x 19.0" x 7.6")
<b>Net weight display</b>	5.8 kg (12.6 lbs)
<b>Net weight packaged</b>	8.87 kg (19.9 lbs)
<b>Mounting standard</b>	VESA (100 x 100 mm)
<b>Recommended modalities</b>	Endoscopy, Laparoscopy, PACS, PM, US, CT, MR
<b>Certifications</b>	<p>MDD 93/42/EEC (Class1), Amended by 2007/47/EC</p> <p>EN 60601-1 3rd Edition (2006) - Medical Electrical Equipment / General Requirements for basic Safety and essential performance</p> <p>IEC 60601-1 3rd Edition (2005) - Medical Electrical Equipment / General Requirements for basic Safety and essential performance</p> <p>ANSI/AAMI ES60601-1 3rd Edition (2005) - Medical Electrical Equipment / General Requirements for basic Safety</p> <p>CAN/CSA-C22.2 No. 60601-1 (2008) - Medical Electrical Equipment - Part 1: General Requirements for basic Safety and Essential Performance</p> <p>Approvals/Marking: CE c-UL-us, DEMKO, PSE, CCC.</p> <p>Note PSE is available on PSU</p> <p>Electromagnetic Compatibility: EMC Medical EMC Standards: IEC/EN 60601-1-2 (2007), EN55011/CISPR 11 ( Class B), FCC CFR47 part 15 &amp; 18</p> <p>RoHS-2, REACH, WEEE compliant</p> <p>IP21 (IPx5 monitor front side only)</p>
<b>Supplied accessories</b>	<p>User manual</p> <p>Mains cables (European, US, Chinese)</p> <p>External power supply</p> <p>Interface cable DVI 3m</p>
<b>Optional accessories</b>	Display pedestal (P/N: K9302060A)
<b>Operating temperature</b>	0 ÷ +40°C
<b>Storage temperature</b>	-20 ÷ +60°C
<b>Operating humidity</b>	10 ÷ 90% (non-condensing)
<b>Storage humidity</b>	10 ÷ 90% (non-condensing)
<b>Operating altitude</b>	3000m max.
<b>Storage altitude</b>	12000m max.

### Timings DVI-VGA

Item	Name	Pixel x Line	Format	Hor. Fr. (kHz)	Vert. Fr. (Hz)	Hor. Total	Vert. Total	DVI	VGA
1	480i	720 x 487	NTSC	15,734	59,94			Y	N
2	480p59	720 x 480	480p	31,47	59,94			Y	N

## 6. Important information

Item	Name	Pixel x Line	Format	Hor. Fr. (kHz)	Vert. Fr. (Hz)	Hor. Total	Vert. Total	DVI	VGA
3	480p60	720 x 480	480p	31,5	60			Y	N
4	576i	720 x 576	PAL I	15,625	50			Y	N
5	576p	720 x 576	576p	31,25	50			Y	N
6	720p29	1280 x 720	720p	22,48	29,97			Y	N
7	720p30	1280 x 720	720p	22,5	30			Y	N
8	720p50	1280 x 720	720p	37,5	50			Y	N
9	720p59	1280 x 720	720p	44,96	59,94			Y	N
10	720p60	1280 x 720	720p	45	60			Y	N
11	1080i25	1920 x 1080	1080i	28,13	50			Y	N
12	1080i29	1920 x 1080	1080i	33,72	59,94			Y	N
13	1080i30	1920 x 1080	1080i	33,75	60			Y	N
14	1080p29	1920 x 1080	1080p	33,72	29,97			Y	N
15	1080p30	1920 x 1080	1080p	33,75	30			Y	N
16	1080p50	1920 x 1080	1080p	56,25	50			Y	N
17	1080p59	1920 x 1080	1080p	67,433	59,94			Y	N
18	1080p60	1920 x 1080	1080p	67,5	60			Y	N
19	DMT0660	604 x 480	VGA	31,5	60			Y	Y
20	DMT0672	604 x 480	VGA	37,86	72,808			Y	Y
21	DMT0675	604 x 480	VGA	37,5	75			Y	Y
22	DMT0685	604 x 480	VGA	43,269	85,008			Y	Y
23	DMT0856	800 x 600	SVGA	35,16	56,25			Y	Y
24	DMT0860	800 x 600	SVGA	37,88	60,32			Y	Y
25	DMT0872	800 x 600	SVGA	48,08	72,19			Y	Y
26	DMT0875	800 x 600	SVGA	46,875	75			Y	Y
27	DMT0885	800 x 600	SVGA	53,74	85,061			Y	Y
28	DMT1060	1027 x 768	XGA	48,4	60			Y	Y
29	DMT1070	1024 x 768	XGA	56,4	70			Y (Diag. mode) <sup>2</sup>	Y (Diag. mode) <sup>2</sup>
30	DMT1075	1024 x 768	XGA	60	75			Y	Y
31	DMT1085	1024 x 768	XGA	68,7	85			Y	Y
32	DMT1175	1152 x 864	XGA+	67,5	75			Y	Y
33	DMT1260G	1280 x 1024	SXGA	64	60			Y	Y
34	DMT1275G	1280 x 1024	SXGA	79,976	75,025			Y	Y
35	DMT1285G	1280 x 1024	SXGA	91,1	85			Y	Y
36	DMT1660	1600 x 1200	UXGA	75	60			Y	Y
37	CVR1460	1400 x 1050	SXGA+	64,744	59,948			Y	Y
38	CVT1460	1400 x 1050	SXGA+ (VESA)	65,32	59,98			Y	Y
39	CVR1660D	1680 x 1050	WSXGA+1	64,67	59,88			Y	Y
40	CVT1660D	1680 x 1050	WSXGA+2	65,29	59,95			Y	Y
41	CVT	1920 x 1200	WUXGA1	74,038	59,95			Y	Y

2. OSD Smart Video set to "Diagnostic"

Item	Name	Pixel x Line	Format	Hor. Fr. (kHz)	Vert. Fr. (Hz)	Hor. Total	Vert. Total	DVI	VGA
42	IBM	640 x 350		31,5	70	800	449	Y (Diag. mode) <sup>2</sup>	N
43	VESA	640 x 350		37,9	85	832	446	Y	Y
44	VESA	640 x 400		24,8	56,3	848	440	N	Y
45	IBM	640 x 400		31,5	70,0	800	449	Y (Diag. mode) <sup>2</sup>	N
46	VESA	640 x 400		37,9	85,0	832	446	Y	Y

### Timings Comp - SOG

Item	Name	Pixel x Line	Format	Hor. Fr. (kHz)	Vert. Fr. (Hz)	Hor. Total	Vert. Total	SOG	RGBS / YPbPr
1	480i	720 x 487	NTSC	15,734	59,94			Y	Y
2	480p59	720 x 480	480p	31,47	59,94			Y	Y
3	480p60	720 x 480	480p	31,5	60			Y	Y
4	576i	720 x 576	PAL I	15,625	50			Y	Y
5	576p	720 x 576	576p	31,25	50			Y	Y
8	720p50	1280 x 720	720p	37,5	50			Y	Y
9	720p59	1280 x 720	720p	44,96	59,94			Y	Y
10	720p60	1280 x 720	720p	45	60			Y	Y
11	1080i25	1920 x 1080	1080i	28,13	50			Y	Y
12	1080i29	1920 x 1080	1080i	33,72	59,94			Y	Y
13	1080i30	1920 x 1080	1080i	33,75	60			Y	Y
14	1080p29	1920 x 1080	1080p	33,72	29,97			Y	Y
15	1080p30	1920 x 1080	1080p	33,75	30			Y	Y
16	1080p50	1920 x 1080	1080p	56,25	50			Y	Y
17	1080p59	1920 x 1080	1080p	67,433	59,94			Y	Y
18	1080p60	1920 x 1080	1080p	67,5	60			Y	Y

### Timings SDI

Item	Name	Pixel x Line	Format	Hor. Fr. (kHz)	Vert. Fr. (Hz)	Hor. Total	Vert. Total	SDI (Ypb)	RGBS / YPbPr
1	480i	720 x 487	NTSC	15,734	59,94			Y	Y
4	576i	720 x 576	PAL I	15,625	50			Y	Y
8	720p50	1280 x 720	720p	37,5	50			Y	Y
9	720p59	1280 x 720	720p	44,96	59,94			Y	Y
10	720p60	1280 x 720	720p	45	60			Y	Y
11	1080i25	1920 x 1080	1080i	28,13	50			Y	Y
12	1080i29	1920 x 1080	1080i	33,72	59,94			Y	Y
13	1080i30	1920 x 1080	1080i	33,75	60			Y	Y
14	1080p29	1920 x 1080	1080p	33,72	29,97			Y	Y
15	1080p30	1920 x 1080	1080p	33,75	30			Y	Y
16	1080p50	1920 x 1080	1080p	56,25	50			Y	Y
17	1080p59	1920 x 1080	1080p	67,433	59,94			Y	Y
18	1080p60	1920 x 1080	1080p	67,5	60			Y	Y

## Dimensions

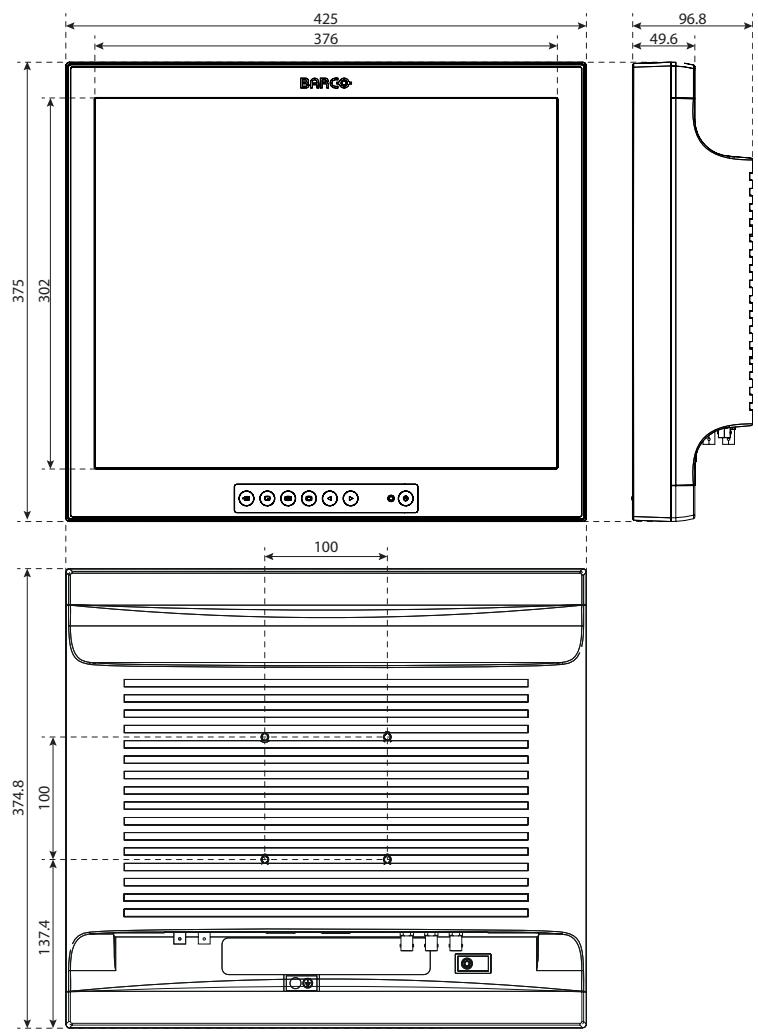


Image 6-2