

CHART & PROJECTOR MANUAL



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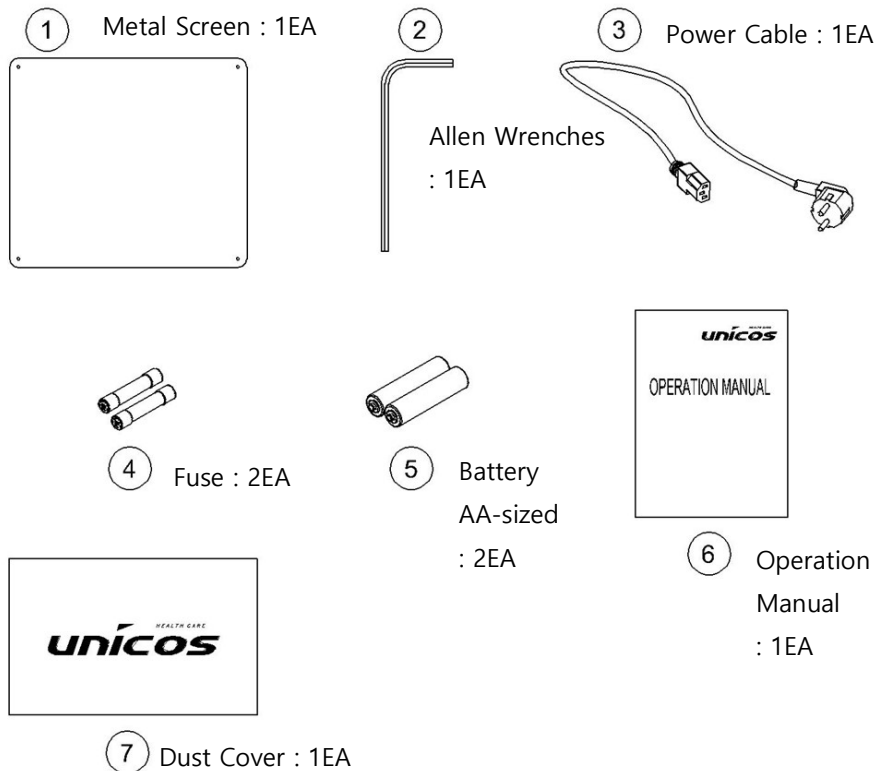
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1. Introduction

Thank you for your purchase of the UNICOS ACP-900 Auto Chart Projector. In the area of subjective refraction, the UNICOS ACP-900 is best used for measuring visual acuity. There are 40 different charts including red/green and polarized filters for the eye optometry. It is fully recommended that you carefully read, understand and follow the steps in this manual in order to ensure safe operation, optimum performance and a longer service life from your new instrument. Please retain this manual for future reference.

2. Package Contents

ACP-900 and accessories were carefully checked and packed prior to the shipment. However, please check condition and contents upon delivery. In addition to UNICOS ACP-900, this shipment includes:



3. Classifications

[Classification under the provision of 93/42/EEC(MDD)] Class I

ACP-900 is classified into Class I system.

[Protection method against electric shock] Class I

ACP-900 is Classified into Class I instrument.

Class I instrument in which protection against electric shock does not rely on basic insulation only, but which includes an additional safety precaution with the provision of the connection of the instrument to the protective earth conductor in fixed wiring of the installation in such a way that any accessible conductive parts cannot become live in the event of a failure of the basic insulation.

[Degree of protection against ingress of liquids] IPX0

ACP-900 is the ordinary instrument (enclosed instrument without protection against ingress of liquids). Be careful not to splash water on the instrument.

[Degree of protection against flammability]









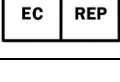
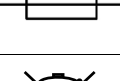

ACP-900 is classified as an equipment not suitable to be used in a Potentially flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Do not use near flammable materials.

[Mode of operation]

Continuous operation

4. Safety Symbols

Symbol	Description
	This symbol indicates a protective earth
	This symbol indicates that important operation, caution, warning and maintenance Instructions are included in this User's Guide.
	This symbol on the main switch indicates that the power is OFF.
	This symbol on the main switch indicates that the power is ON.
	Instruction for user manual
	Operating instructions
	Manufacturer
	Date of Manufacturer
	Authorized Representative in the European community
	This symbol indicates a fuse.
	Do not throw away the waste to inappropriate place

For EU Countries




The following mark, the name & address of the EU Representative shows compliance of the instrument with Directive 93/42/EEC.





EU Representative:

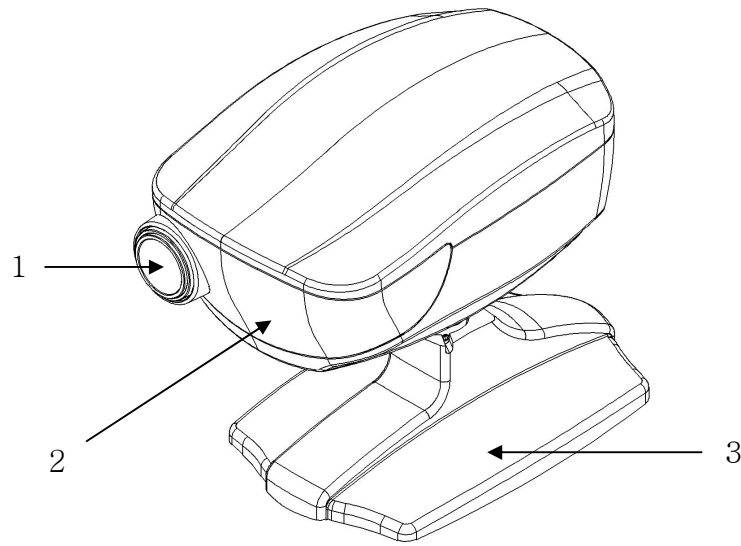
Ellegi Medical Optics s.r.l.
 Via Pisciarelli, 79 – 80078
 Pozzuoli (NA) ITALY
 TEL:081.5499645 - 081.5498044
Partita I.V.A. 05354730631

5. General Safety Information

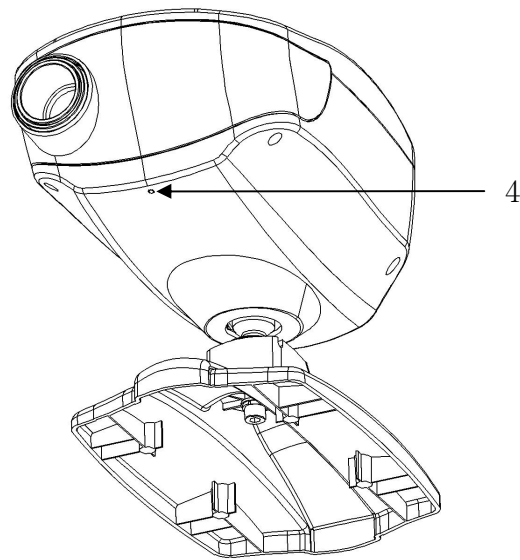
	<p>At Operation</p> <ul style="list-style-type: none">- To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.- Never disassemble or touch the inside of the instrument. <p>“No modification of this equipment is allowed”</p> <p>“Do not modify this equipment without authorization of the manufacturer”</p> <p>“If this equipment is modified, appropriate inspection and testing must be conducted to ensure continued safe use of equipment”</p> <p>This may result in an electric shock or instrument malfunction.</p> <ul style="list-style-type: none">-Never yank the power cord to disconnect from wall outlet but hold the plug while disconnecting.-This can weaken the metal core of the cord and may result in a short circuit or an electric shock. <ul style="list-style-type: none">- Temperature : +10°C ~ +40°C- Humidity : 30% ~ 90% RH- Atmospheric pressure range : 700 hPa ~ 1060 hPa
	<p>At Storage</p> <ul style="list-style-type: none">- Do not store the instrument in a place where it may get wet or where poisonous gas or liquid is stored.- Avoid storing the instrument in an area with excessive heat, humidity, or dust. <p>Recommended ranges:</p> <ul style="list-style-type: none">- Temperature : -10°C ~ +70°C- Humidity : 10% ~ 95% RH- Atmospheric pressure range : 500 hPa ~ 1060 hPa
	<p>At Installation</p> <ul style="list-style-type: none">- Do not install the instrument near water. <p>If water gets into the internal structure, there is the possibility of electrical Shock or instrument malfunction.</p> <ul style="list-style-type: none">- Install the instrument in a stable and level place where vibration or shock does not occur.

	<p>-The instrument may not perform observation correctly or may malfunction. Also, if the instrument is tripped over because of any accidental shock, it may result in possible injury.</p>
	<p>After Use</p> <ul style="list-style-type: none"> - If the instrument is not be used for a long time, disconnect the power cord from the wall outlet. Otherwise, it may cause a tire. - Remove batteries from the battery case of the remote controller when the remote controller will not be used for a long time.
	<p>At Disposal</p> <ul style="list-style-type: none"> - Follow local governing ordinances and recycling plans regarding disposal or recycling of device components. - Check the specified disposing method for the specific waste in advance, especially when disposing the batteries used in the remote controller. - When disposing packing materials, sort them by the materials and follow local governing ordinances and recycling plans.

6. Configurations

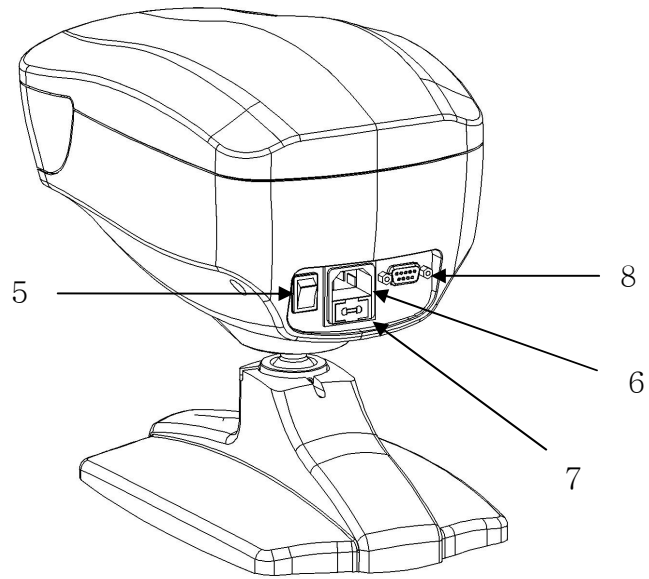


[Fig.1 Front View]



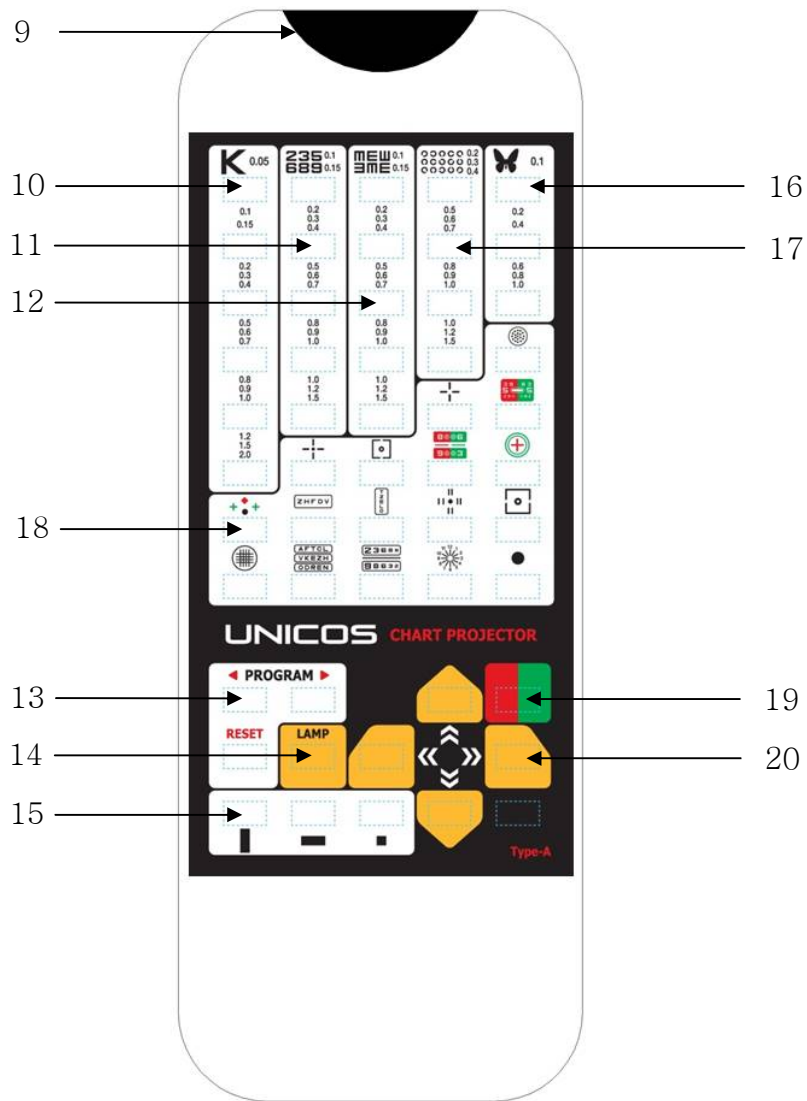
[Fig.2 Bottom View]

1. Projection lens / Focusing wheel
2. Receiving window
3. Table stand
4. Pilot Lamp



[Fig.3 Rear View]

- 5. Power On/Off Switch
- 6. AC Power Inlet
- 7. Fuse Holder
- 8. RS-232 Port



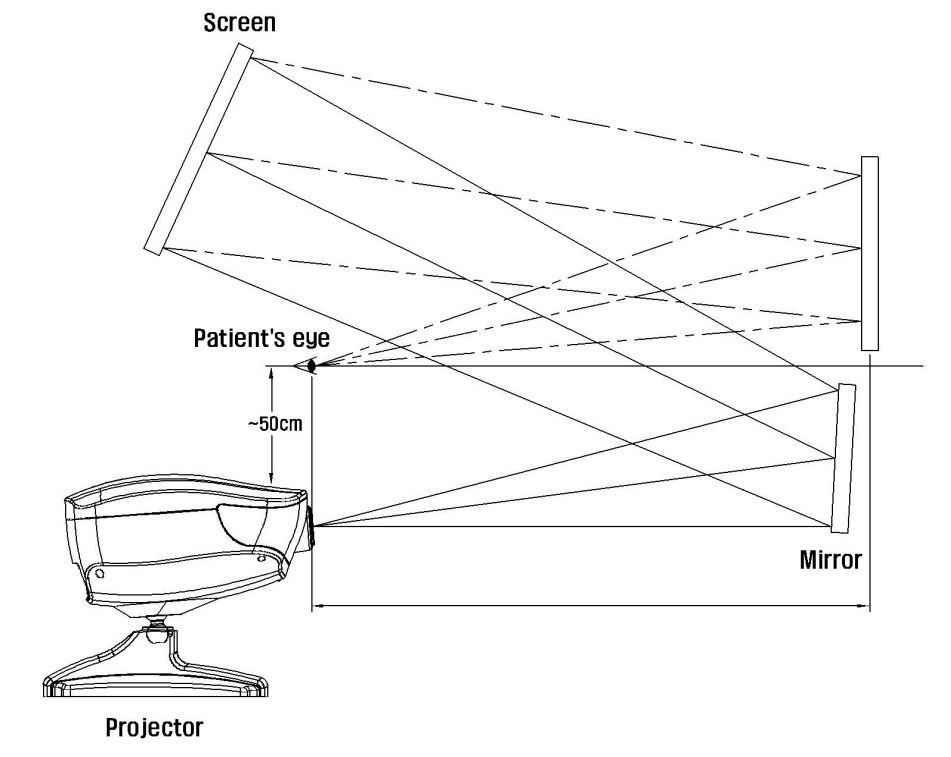
[Fig.4 Remote control View]

9. Inflated ray transmitter
10. Letters chart
11. Number chart
12. Snellen chart
13. Program
14. Lamp ON/OFF
15. Vertical, horizontal line, single Letter Masking
16. Children chart
17. Landolt chart
18. Function chart
19. Red/Green Test
20. Direction

7. Installation

The ACP-900 should be installed according to the following procedures:

1. If using a wall mount, it is best to locate a wall stud to support the weight of instrument.
2. Determine the refracting distance (form the patient's eye to the screen) and install the projection screen.
3. Position the instrument at the same distance from the screen to the patient within the range between 2m and 7m. To obtain longer refracting distances in small rooms, a mirror or systems of mirrors can be used. In this case, a high quality front surface mirror is required.



4. Check the three-dimensional alignment of the system. The instrument is optimized when the projection screen is angled to direct light to the patient's head. Place a mirror on the screen. The light should project where the patient's head would be.

8. Focusing

To obtain the correct focus:

1. Measure the distance from the patient to the screen (refracting distance).
2. Turn the Auto Chart Projector on, and using the remote control, project the 0.05 "K" onto the screen.
3. If using a wall mount, it is best to locate a wall stud to support the weight of instrument.
4. Adjust the position of the instrument forward or backward for sizing.
5. Adjust for sharpness and clarity by turning the focusing wheel left or right as needed.

9. Operating Instructions

1. Turn on the power switch of the instrument.

The projection lamp lights and the chart for 0.05 vision shall be viewed in 3 seconds.


2. Changing the chart

Press the appropriate chart button on the remote controller.

The charts have 31 selections.

3. Isolating the visual acuity chart

- To use Vertical line masking:

Press 

- ☞ To move the position right or left

Press  or 

- ☞ To move the position up or down

Press  or 



- To use Horizontal line masking:

Press 

- ☞ To move the position right or left


Press  or 

- ☞ To move the position up or down

Press  or 



- To use Single letter masking:

Press 

- ☞ To move the position right or left

Press  or 

- ☞ To move the position up or down

Press  or 



- To use Red/Green filter:

Press 

- To release masking and filter:

Press any chart button



10. Charts Description

A-TYPE

B-TYPE

Feet

C-TYPE

Meter

D-TYPE

Russia

11. Maintenance



Risk of electric shock. Always disconnect the power cord from the wall and the instrument prior to performing any of the following procedures.

Do not touch the projector with wet hands.

■ Maintenance

There is no periodic or routine user maintenance required.

■ Cleaning

There are no cleaning requirements other than regular office housekeeping, such as dusting.

☞ Cleaning the main body

< Projection Lens >

- 1) Blow dusts with a blower brush.
- 2) If it is not clean enough, clean the lens surface with clean cotton.

< Cover and Screen >

- 1) Wipe with a dry and soft cloth.
- 2) If for some reason the instrument becomes soiled, wipe it with the damp lint-free cloth and mild detergent. Then, wipe off with a dry cloth to finish.

■ Dis-assembling the upper case

- 1) Turn off the power and pull out the power cord.
- 2) Unfasten the screw in counterclockwise at the back side of case
- 3) Disassemble the Upper Case by lifting it.
- 4) In case of reassembling, place the Upper case on the main body and adjust to the front position. Then, fasten the screw in clockwise.

■ Replacement of Fuses

- 1) Turn off the power switch and disconnect the power cord.
- 2) Push and turn the fuse holder a quarter counterclockwise with your finger and remove it.
- 3) Pull out the fuse from the fuse holder and check the condition.

- 4) Replace the fuse with the provided spare or equivalent as specified below.

VOLTAGE	FUSE
100V ~ 240V	1A 250V ; T1AL

- 5) Simply return it with the fuse holder to the socket. Push and turn it a quarter clockwise to lock.

12. Basic Trouble Shooting



Note : Risk of electric shock. Always disconnect the power cord from the wall and the instrument prior to performing any of the following procedures. Do not touch the projector with wet hands.

- If the instrument does not function at all:
 - 1) Check the facility power source. (Circuit Breakers)
 - 2) Check the electrical connections. (Power Cord)
 - 3) Check the main fuse located on the rear of the unit.

- If the projector lamp does not light(Ask the manufacturer or service person for help):
 - 1) Check the main On/Off Switch.
 - 2) Replace the lamp with the spare lamp.



The lamp may be HOT! Do not touch the Lamp directly and allow the sufficient amount of time to cool down the heat.

- If the projector turns on but does not function:
 - 1) Check the batteries in the remote control.

13. Transportation

- Make sure the instrument is disconnected from the power source.
 - If the instrument was installed on a custom mount, please remove the unit from the mount.
 - Pack the instrument in a sturdy carton with suitable packing materials.
 - After packing, do not hurl and impact cause of breakable goods.
- Do not use this machine near by other machines or electric bulb (ex. Halogen lamp), it will improperly operate on the effect of electronic waves.

14. Technical Specifications

Chart	40 Selections
Chart selection speed	Average 0.2 sec.
Mask	1 open 5 horizontal lines 8 vertical lines 21 single letters
Filter	Red/Green
Projection distance	2.0m~7.0m (3m is standard)
Projection magnification	30 x (at 5m)
Tilt angle	Ball joint (± 15 degree)
Lamp	5V 4W(LED)
Power source	AC 100~240V 50/60Hz
Power consumption	45 VA
Auto-Off function	5~10minutes after
Dimensions	Main body : 290 x 186 x 198mm Table Stand : 169 x 365 x 82mm Remote controller : 20 x 64 x 195mm
Net weight	3.62kg (body : 3.18kg + Stand: 0.44kg) Remote controller : 110g
Accessories	Dust cover : 1EA Metal screen (400mm x 350mm) : 1EA Spare fuses : 2EA Batteries (AA-sized) : 2EA Power cable : 1EA Allen wrenches(2.5mm and 5mm) : 1EA Operation manual : 1EA
Optional accessories	Red/green glasses Polarization glasses
Interface	RS-232 connector for simultaneous control of chart, mask and R/G filter by a motorized refractor's control unit.

15. Service Information

■ Repair

- Basically, keep this instrument clean. Don't use volatile object, thinner or benzene, etc.
- Polish each part with a dry cloth containing detergent solution.

Model of the instrument : ACP-900

Serial Number : 7-Digit characters indicated the name plate

Symptom : In detail

AUTO CHART PROJECTOR				
UNICOS ACP-900				
INPUT : 100-240V~ , 50/60Hz, 45VA				
SN				
	UNICOS Co., Ltd. 282-30, Munji-ro, Yuseong-gu, Daejeon, Korea			
	Ellegi Medical Optics s.r.l. Via Pisciarelli, 79 - 80078 Pozzuoli (NA) ITALY Tel. 081.5499645 - 081.5498044 Partita I.V.A. 0 5 3 5 4 7 3 0 6 3 1			
MADE IN KOREA				
A				
B				
C				
D				



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<http://www.e-unicos.com>

16. EMC (ELECTROMAGNETIC COMPATIBILITY) Information

The Electromagnetic Compatibility Directive sets the essential requirements for electrical and electronic equipment that may disturb or even be disturbed by other equipment. The ACP-900 complies with these requirements as tabled below. Follow the guidance on the tables for use of the device in the electromagnetic environment.

ACP-900 is suitable for the home healthcare environment.

Warning for EMC

Minimum distance from RF communications	Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the ACP-900, including cables specified by the UNICOS. Otherwise, degradation of the performance of this equipment could result."
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EMC Information

Phenomenon	Basic EMC standard or test method	Operating mode	Port tested	Test Voltage	Test level/requirement
Mains terminal disturbance voltage	CISPR11:2015	Image display	AC Mains	120 V, 60 Hz 220 V, 60 Hz 230 V, 50 Hz	Group1, Class A
Radiated disturbance	CISPR11:2015	Image display	Enclosure	120 V, 60 Hz 220 V, 60 Hz 230 V, 50 Hz	Group1, Class A
Harmonic Current Emission	IEC 61000-3-2:2014	Image display	AC Mains	230 V, 50 Hz	Class A
Voltage change, Voltage fluctuations and Flicker Emission	IEC 61000-3-3:2013	Image display	AC Mains	230 V, 50 Hz	Pst: 1 Plt: 0.65 Tmax:0.5 dmax: 4% dc: 3.3%
Electrostatic Discharge Immunity	IEC 61000-4-2:2008	Image display Stand by	Enclosure	120 V, 60 Hz 220 V, 60 Hz 230 V, 50 Hz	± 8 kV/Contact ± 2, ± 4, ± 8, ± 15 kV/Air
Radiated RF Electromagnetic Field Immunity	IEC 61000-4-3:2006 /AMD2:2010	Image display Stand by	Enclosure	120 V, 60 Hz 220 V, 60 Hz 230 V, 50 Hz	3 V/m 80 MHz-2.7 GHz 80% AM at 1 kHz
Immunity to Proximity Fields from RF wireless Communications Equipment	IEC 61000-4-3:2006 /AMD2:2010	Image display Stand by	Enclosure	120 V, 60 Hz 220 V, 60 Hz 230 V, 50 Hz	Table 9 in IEC 60601-1-2: 2014
Electrical Fast Transient/Burst Immunity	IEC 61000-4-4:2012	Image display Stand by Image display Stand by	AC Mains	120 V, 60 Hz 220 V, 60 Hz 230 V, 50 Hz 120 V, 60 Hz 220 V, 60 Hz 230 V, 50 Hz	± 2 kV, 100 kHz repetition frequency
Surge Immunity	IEC 61000-4-5:2014	Image display Stand by Image display Stand by	AC Mains	120 V, 60 Hz 220 V, 60 Hz 230 V, 50 Hz 120 V, 60 Hz 220 V, 60 Hz	Line to Line ± 0.5 kV, ± 1 kV Line to Ground ± 0.5 kV, ± 1 kV, ±

				230 V, 50 Hz	2 kV
Immunity to Conducted Disturbances Induced by RF fields	IEC 61000-4-6:2013	Image display Stand by	AC Mains	100 V, 50 Hz 100 V, 60 Hz 240 V, 50 Hz 240 V, 60 Hz	3 V 0.15-80 MHz 6 V in ISM bands Between 0.15 MHz and 80 MHz 80% AM at 1 kHz
Power Frequency Magnetic Field Immunity	IEC 61000-4-8:2009	Image display Stand by	Enclosure	100 V, 50 Hz 100 V, 60 Hz 240 V, 50 Hz 240 V, 60 Hz	30 A/m 50 Hz & 60 Hz
Voltage dips	IEC 61000-4-11:2004	Image display Image display	AC Mains	120 V, 60 Hz 220 V, 60 Hz 230 V, 50 Hz 120 V, 60 Hz 220 V, 60 Hz 230 V, 50 Hz	0 % UT: 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°
					0 % UT; 1 cycle and 70 % UT; 25/30 cycles Single phase: at 0°
Voltage interruptions	IEC 61000-4-11:2004	Image display	AC Mains	230 V, 50 Hz	0 % UT; 250/300 cycle