LG Surgical Monitor Tech Highlights

31.5-inch 4K Surgical Monitor | 32HL714S, 32HL710S
27-inch 4K Surgical Monitor | 27HJ710S
27-inch Full HD Surgical Monitor | 27HK510S

LG | Business Solutions

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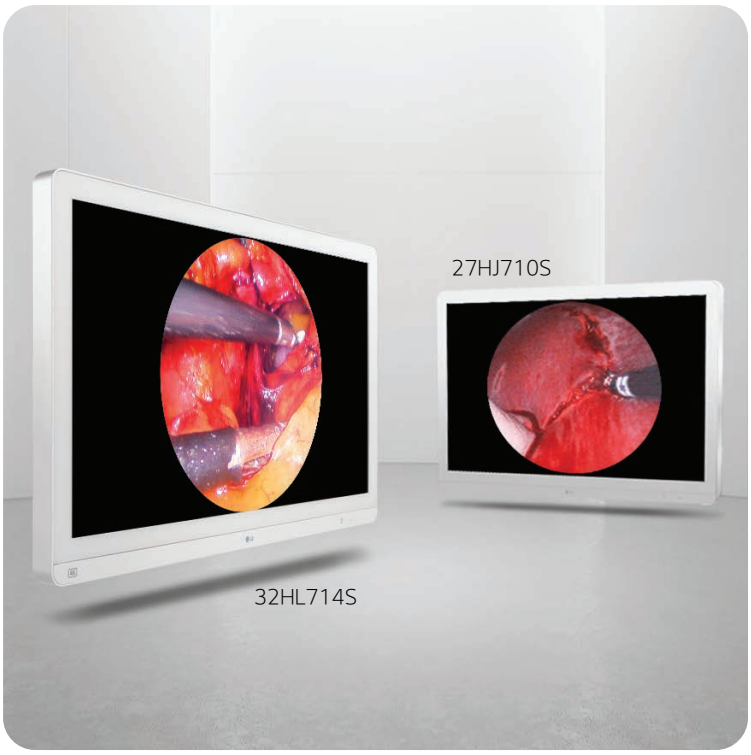


Stay Confident with LG Surgical Monitor

Among possible alternatives, surgical patients tend to prefer less invasive laparoscopic surgery. However, such surgery requires accurate and clear images supported by high-quality monitors that ensure accuracy and safety for the surgical procedure.

A leader in the global display market for more than 35 years, LG has introduced a variety of high-resolution surgical monitors that offer innovative technology.

Each LG Surgical Monitor provides 'Accuracy' – with high image quality to reduce the risk of misperception during surgery. In addition, it provides 'User Convenience' as a product optimized for the medical environment and 'Reliability' to manage the variables that may occur during surgery.

Find your path to the best outcomes with LG Surgical Monitors.

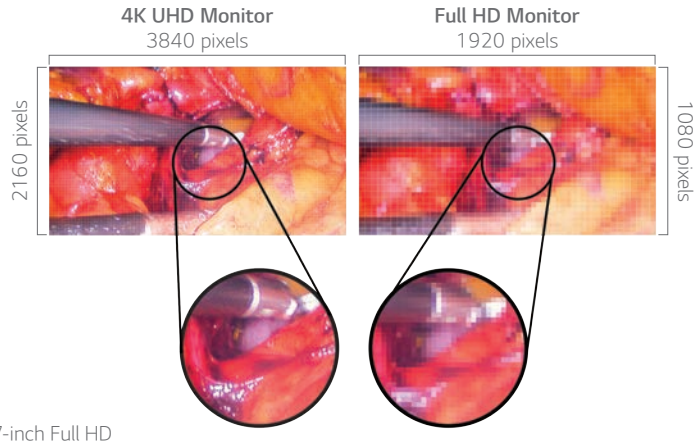
Accuracy

Clear Medical Images

4K (3840x2160)

Exacting image quality is pivotal for the improvement of medical outcomes. A 4K panel can achieve images with a resolution four times higher than that provided by Full HD. Even images of small objects, such as sutures and blood vessels are much clearer on the screen of the same size with 4K resolution. Also, Full HD images with less than 4K resolution can be optimized for a 4K monitor.

This improvement in clarity also improves depth perception, meaning LG's 4K Surgical Monitors allow surgeons to clearly see inside the patient, improving the accuracy and safety of the surgical procedure. Furthermore, because the pixel size is reduced, a 4K monitor can be comfortably viewed at much closer distances without seeing individual pixels.

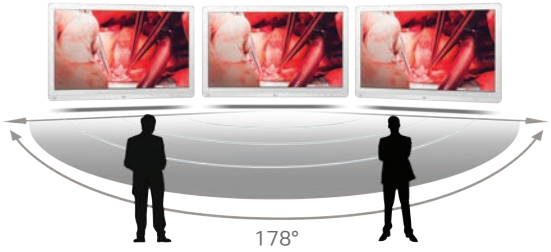


*32HL714S & 32HL710S : 31.5-inch 4K, 27HJ710S : 27-inch 4K, 27HJ510S : 27-inch Full HD

178° Wide Viewing Angle with Minimal Color Shift

IPS Panel | Wide Viewing Angle

Since a surgery involves many medical staff, surgical monitors should be able to display accurate images from all angles. A conventional TN panel provides a limited viewing angle, which eventually leads to considerable color inversion or distortion. By contrast, due to the wide viewing angle, the IPS panel can provide clear images from all angles with minimal distortion. Due to using LG Surgical Monitors with IPS panels, medical personnel in the operating room get an accurate assessment of surgical situation and, therefore, are better able to produce exact and accurate outcomes.



IPS Panel

TN Panel

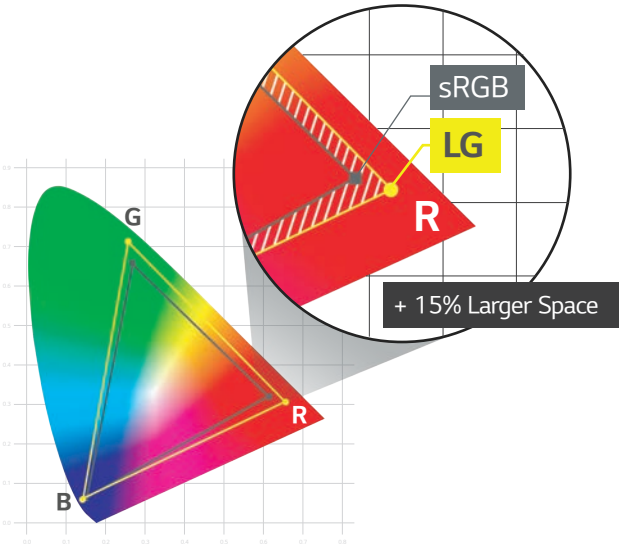
Increased Visibility and Depth Perception

sRGB 115% (Area) | Color Calibrated | DICOM* Part 14

Minimally invasive surgery is the preferred method of surgery for many operations as it reduces the pain and recovery time for patients compared to open surgery. However, these less invasive procedures restrict visibility to what can be seen by the camera and displayed on the monitor, reducing resolution, brightness, color, clarity, and depth perception.

LG Surgical Monitor with sRGB 115% (Area) was created specifically for less invasive surgical procedures. Using LG Surgical Monitor with sRGB 115% (Area), surgeons obtain accurate and realistic images with maximally clear and bright color reproduction, particularly in the red spectrum. Furthermore, in order to ensure accurate depth perception, the DICOM part 14 standard is applied to the grayscale tone characteristics of monitors used in the medical field.

Accurate and consistent reproduction of shades and colors on medical images considerably enhances safety of surgeries.



*DICOM : Digital Imaging and Communications in Medicine.
*LG Surgical Monitor reproduced with sRGB 115% (Area), for over 99%(Coverage).

User Convenience

View Multiple Signals at Once

Up to 4 PBP | PIP | Multi-Modality Connectivity

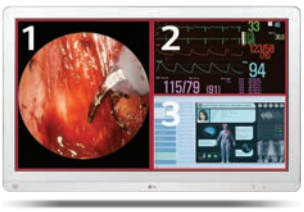
Following the introduction of operating room hybridization in recent years, there has been steady growth in minimally invasive surgery, robotic surgery and the use of video equipment during operations. In the limited space of the operating room, a variety of medical information – such as endoscopic and microscopic images, surgical video feeds, heart rate monitoring, respiratory and brain activity, X-ray and ultrasound images, as well as electronic patient charts – has to be easily accessible and visible to the medical staff. According to many medical staff, an essential component to adequately addressing the challenges of modern surgery is video integration.

Considering all these factors, the 31.5-inch 4K Surgical Monitor, which supports up to 4PBP and allows medical professionals to see multiple signals at once, is an ideal option. Using the 31.5-inch 4K Surgical Monitor, a surgeon or a member of the medical staff can, for instance, see a combination of endoscopic and fluoroscopic observations while monitoring vital signs.

This video integration requires an interface that is compatible with a variety of analog and digital devices. The LG Surgical Monitor guarantees wide-ranging compatibility with both legacy (VGA and S-Video) and modern (DVI and 12G-SDI*) video interfaces. While the broad input support of the LG Surgical Monitor provides clear visualization of HD endoscopic video, patient and surgery information, pathology images and more, a wide array of outputs ensures hassle-free connectivity to digital equipment (e.g., color printers).

*32HL714S & 32HL710S : Up to 4PBP / PIP, 27HJ710S & 27HK510S : Up to 2PBP / PIP

3PBP



4PBP

PIP

Flexible Operation Mode

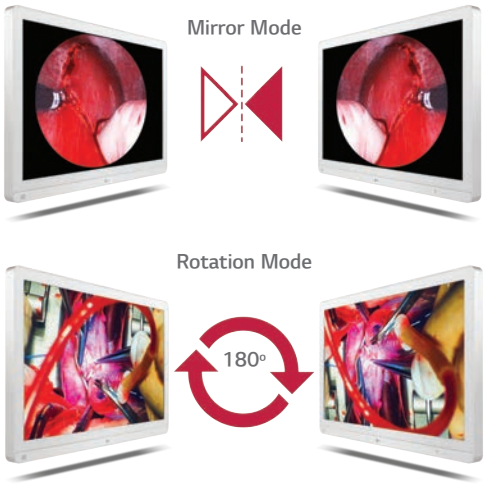
Mirror Mode & Rotation Mode

By combining two surgical displays with a single output device, one can get both a normal view and a mirror image, which provides different users (or a single user) with separate views. In surgeries that require several surgeons, this feature is indispensable.

A mirrored screen makes it possible to see the screen in the same direction as the scene seen from the opposite side of the operating table, so all medical staff in the operating room can accurately share the view of operating scene. This helps an assistant surgeon see and understand the movements of the chief surgeon.

During endoscopy, regardless of the orientation of the endoscope camera, the image can be rotated and displayed in an easy-to-view direction, which contributes to improving comfort in operating room.

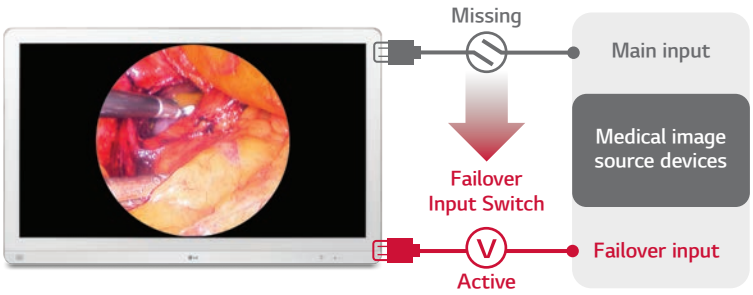
*Only for 32HL714S, 32HL710S



Seamless Input Signal for Medical Images

Failover Input Switch

LG Surgical Display supports Failover Input Switch feature. This automatically switches the display to failover input (backup) when the main input is suddenly missing, then restores the main input once the signal is back. This means in the case of a technical failure; the surgeon and all medical staff will continue to see the information they need during surgery — eliminating the risk of confusion in the operating room.



*Failover Input Switch available from May 5, 2020 (32HJ710S), May 22, 2020 (27HK510S)

Single Cable Upto 70m*

12G-SDI Support

As the usage of 4K and UHD is rising in the medical field, stable transmission of 4K medical images is pivotal. The 32HL714S supports 12G-SDI, which enables stable and long-distance transmission of medical images. Through 12G-SDI feature, 4K-equivalent signals can be transmitted with a single coaxial cable, even until 70 meters (max).

*12G-SDI input transmission distance : max. 70m (When using BELDEN cable : max.50 / CANARE UHD 5.5 cable : max. 70m)

Reliability

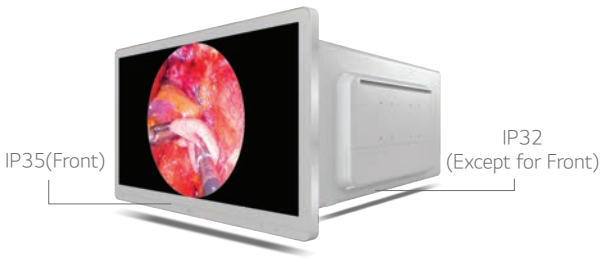
Dustproof & Water Resistance

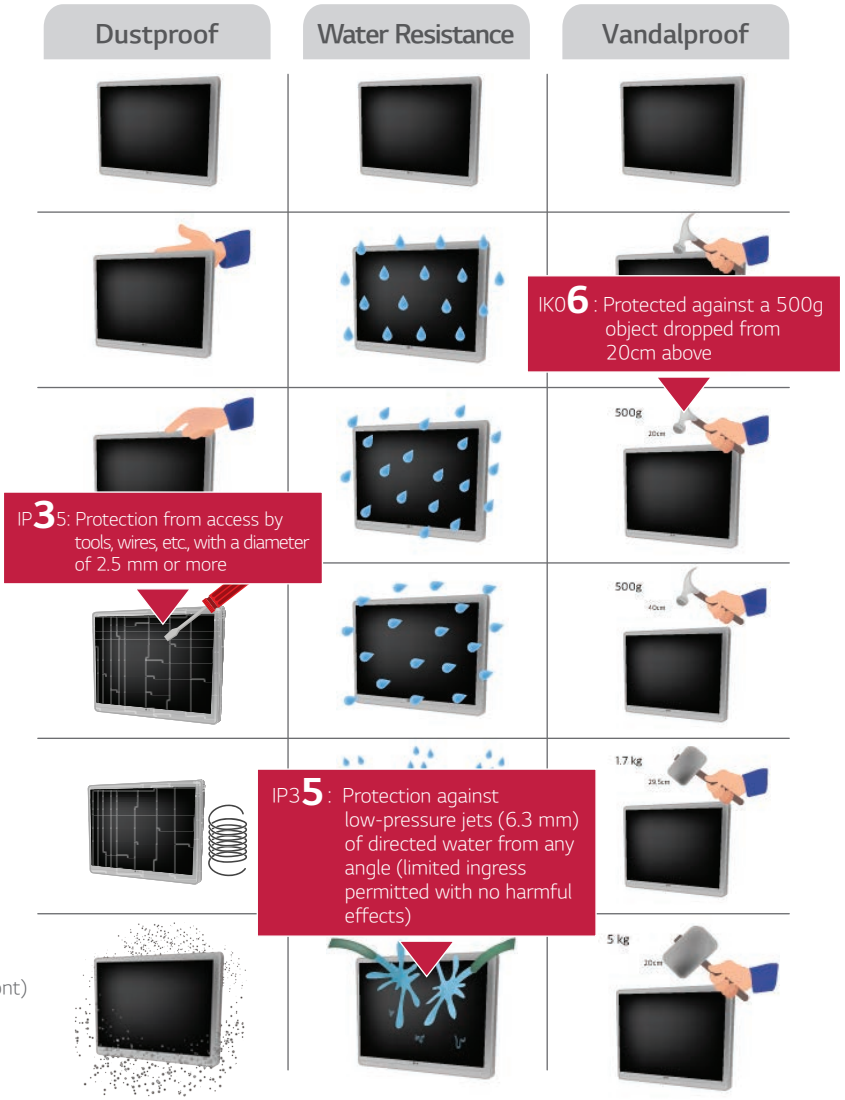
IP35 (Front)
IP32 (Except for Front) | IK06

Given that surgeries are characterized by high unpredictability, a clean and stable medical monitor can minimize the risks in demanding environments. There is also a need of meeting high hygiene standards to avoid infection.

To prevent a potential risk in a demanding environment, as well as to protect the screen from unexpected contact with substances such as blood or bodily fluids, LG has specially designed a cleanable, reliable medical monitor with the rating of IP35 on the front and IP32 on the back. Medical monitors touched by doctors, patients, and contact with unexpected body fluid. Medical equipment should be sterile, and its contact with dust, bodily fluids, and sprayed water for washing down should be avoided. With IP35, infection control is easier and asset management risk is considerably reduced.

Moreover, LG's surgical monitors are highly durable and have the rating of IK06 grade, resulting in a lower potential risk in demanding surgical environments.





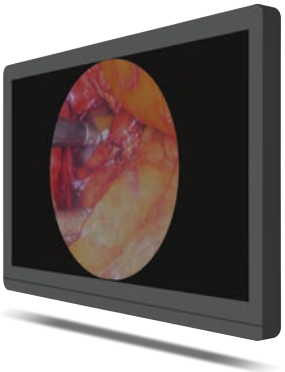
Ensure a Consistently Accurate Display

Brightness Stabilization

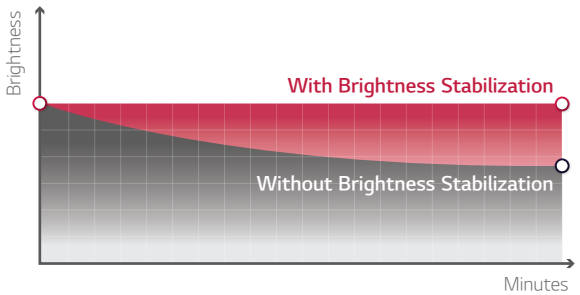
Surgical monitors should maintain constant brightness, even after prolonged surgery. Conventional displays can vary in luminance by more than 20% within the first several hours after being turned on. Since surgical monitors are the eyes of the surgeon during image-guided surgery, a screen that fluctuates can negatively affect the surgical outcome.

The LG Surgical Monitor's sensor measures the backlight and automatically compensates for changes in brightness caused by ambient temperature and aging to maintain a consistently stable display. This ensures the correct brightness for the surgical setting is consistently maintained.

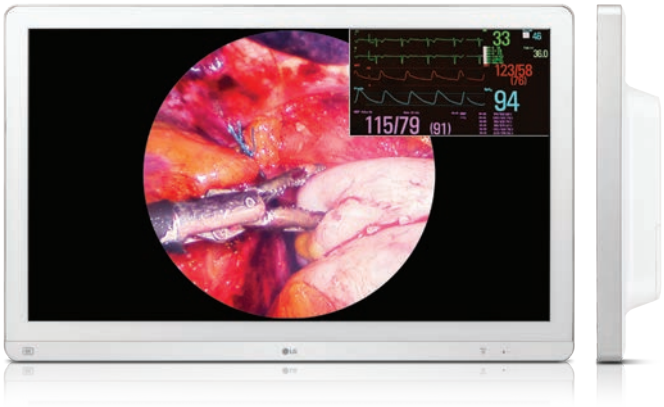
With Brightness Stabilization



Without Brightness Stabilization



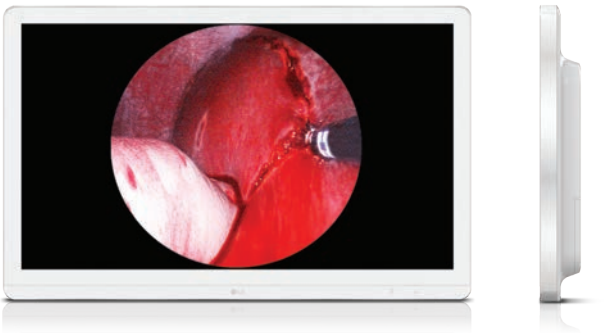
Product Brief



31.5-inch 4K Surgical Monitor

| 32HL714S, 32HL710S |

- 31.5-inch 4K (3840x2160) IPS Display
- HDR 10
- sRGB 115% (Area), 800cd/m² (Typ.)
- Mirror Mode & Rotation Mode
- Up to 4PBP / PIP



27-inch 4K Surgical Monitor

| 27HJ710S |

- 27-inch 4K (3840x2160) IPS Display
- Protection Glass
  (1.3t, Anti-reflection, Anti-fingerprint)
- sRGB 115% (Area), 800cd/m² (Typ.)
- Brightness Stabilization
- IP35 (Front) / IP32 (Except for Front)

27-inch Full HD Surgical Monitor

| 27HK510S |

- 27-inch Full HD (1920x1080) IPS Display
- sRGB 115% (Area), 1000cd/m² (Typ.)
- Brightness Stabilization
- DICOM Compliant
- IP35 (Front) / IP32 (Except for Front)

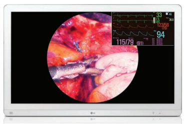
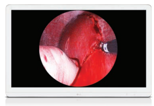
Feature Matrix

LG Surgical Monitors

Resolution		4K (3840x2160)		Full HD (1920x1080)
Inch (Aspect Ratio)		31.5-inch (16:9)	27-inch (16:9)	27-inch (16:9)
Model		32HL714S, 32HL710S	27HJ710S	27HK510S
Accuracy	Resolution	4K (3840x2160)	4K (3840x2160)	Full HD (1920x1080)
	Brightness (Typ.)	800 cd/m²	800 cd/m²	1000 cd/m²
	IPS Panel	✓	✓	✓
	Color Gamut (Typ.)	sRGB 115% (Area), sRGB over 99% (Coverage)	sRGB 115% (Area), sRGB over 99% (Coverage)	sRGB 115% (Area), sRGB over 99% (Coverage)
	Color Calibrated	✓	✓	✓
	DICOM Part 14	✓	✓	✓
User Convenience	PBP / PIP	✓ (2/3/4PBP)	✓ (2PBP)	✓ (2PBP)
	Mirror Mode & Rotation Mode	✓		
	Failover Input Switch	✓	✓	✓
	12G-SDI Support	✓ (Only for 32HL714S)		
Reliability	IP/IK Grade	IP35 (Front) IP32 (Except for Front) IK06	IP35 (Front) IP32 (Except for Front) IK06	IP35 (Front) IP32 (Except for Front) IK06
	Brightness Stabilization	✓	✓	✓

Specification

LG Surgical Monitors

Resolution		4K (3840x2160)		Full HD (1920x1080)
Inch (Aspect Ratio)		31.5-inch (16:9)	27-inch (16:9)	27-inch (16:9)
Model		32HL714S, 32HL710S	27HJ710S	27HK510S
				
Panel	Panel Type	IPS	IPS	IPS
	Color Gamut (Typ.)	sRGB 115% (Area), sRGB over 99% (Coverage)	sRGB 115% (Area), sRGB over 99% (Coverage)	sRGB 115% (Area), sRGB over 99% (Coverage)
	Viewing Angles (CR≥10)	178° (Right/Left), 178° (Up/Down)	178° (Right/Left), 178° (Up/Down)	178° (Right/Left), 178° (Up/Down)
	Brightness (Typ.)	800 cd/m²	800 cd/m²	1000 cd/m²
	Surface Treatment	Protection Glass (1.6t, Anti-reflection, Anti-fingerprint)	Protection Glass (1.3t, Anti-reflection, Anti-fingerprint)	Protection Glass (1.6t, Anti-reflection, Anti-fingerprint)
	Contrast Ratio (Typ.)	1300:1	1000:1	1000:1
	Response Time (GTG[1])	14ms (Off- setting), 5ms (Faster- setting)	14ms (Off- setting), 5ms (Faster- setting)	14ms (Off- setting), 5ms (Faster- setting)
Feature	DICOM Compliant	Yes	Yes	Yes
	HW Calibration	Yes (True Color Pro)	Yes (True Color Pro)	Yes (True Color Pro)
	HDR	HDR 10	No	No
Video Signals	Input Terminals	32HL714S : HDMI x1, DisplayPort x1, DVI x1, 12G-SDI x1 32HL710S : HDMI x1, DisplayPort x1, DVI x1, 3G-SDI x1	HDMI x1, DisplayPort x1, DVI x1, 3G-SDI x1	HDMI x1, S-Video x1, Composite x1, 3G-SDI x1, DVI-I x1, D-Sub x1(DSUB to DVI-I Gender Cable), Component x1 (DSUB to DVI-I Gender Cable)
	Output Terminals	32HL714S : DisplayPort x1, DVI x1, 12G-SDI x1 32HL710S : DisplayPort x1, DVI x1, 3G-SDI x1	DisplayPort x1, DVI x1, 3G-SDI x1	3G-SDI x1, DVI-D x1
Connectivity	USB	1 upstream, 1 downstream	1 upstream, 1 downstream	1 upstream, 1 downstream
Power	AC Input	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz	100-240Vac, 50/60Hz
	Power Consumption (Max.)	32HL714S : 180W 32HL710S : 120W	120W	120W
	Power Consumption (DC Off)	Less than 0.3W	Less than 0.3W	Less than 0.3W
Resistance Rating		IP35 (Front), IP32 (Except for Front), IK06	IP35 (Front), IP32 (Except for Front), IK06	IP35 (Front), IP32 (Except for Front), IK06
Certifications & Standards		IEC(IEC 60601-1 / IEC 60601-1-2), EN(EN 60601-1 / EN 60601-1-2), IEC(IEC 60950-1 / IEC 55032, 55024), EN (EN 60950-1 / EN 55032, 55024) cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2NO. 60601-1) FCC (FCC part 15 Class A), FDA (Registration (Class I)), RoHS, REACH, WEEE	IEC(IEC 60601-1 / IEC 60601-1-2), EN(EN 60601-1 / EN 60601-1-2), IEC(IEC 60950-1 / IEC 55032, 55024), EN (EN 60950-1 / EN 55032, 55024) cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2NO. 60601-1) FCC (FCC part 15 Class A), FDA (Registration (Class I)), RoHS, REACH, WEEE	IEC(IEC 60601-1 / IEC 60601-1-2), EN(EN 60601-1 / EN 60601-1-2), IEC(IEC 60950-1 / IEC 55032, 55024), EN (EN 60950-1 / EN 55032, 55024) cUL (ANSI/AAMI ES 60601-1, CSA CAN/CSA-C22.2NO. 60601-1) FCC (FCC part 15 Class A), FDA (Registration (Class I)), RoHS, REACH, WEEE
User Convenience	PBP / PIP	PBP (2/3/4PBP) / PIP	PBP (2PBP) / PIP	PBP (2PBP) / PIP
	Screen Filp	Mirror Mode & Rotation Mode	No	No
	Failover Input Switch[2]	Yes	Yes	Yes
Physical Specifications	Weight	32HL714S : 13.5 kg (29.8 lb) 32HL710S : 12.4 kg (27.3 lb)	7.7 kg (17 lb)	7.7 kg (17 lb)

1) GTG : Gray to gray response time
2) Failover Input Switch available from May 5, 2020(32HJ710S), May 22, 2020(27HK510S)

LG Business Solutions

LG Electronics Inc.
http://www.lge.com/global/business