

Technical Specifications *

| | HyLED X9, HyLED X9M | HyLED X5 |
|---|---|--------------------------------|
| Central illuminance (at 1m distance) | 160,000 lux | 140,000 Lux |
| Light field diameter (at 1m distance) | 140-320mm in ten levels | 140-320mm in ten levels |
| Light field(D50/D10) ** | 70% | 70% |
| Depth of illumination (20%) | 1,200mm | 1,200mm |
| Depth of illumination (60%)(Depth Mode) | 900mm | / |
| Color Temperature | Standard: 4,350K | Standard: 4,350K |
| | Variable CCT: 3,500-5,100K *** | Variable CCT: 3,500-5,100K *** |
| Color rendering index(Ra) | 99 | 99 |
| Color rendering index(R9) | 97 | 97 |
| Shadow dilution with tube | 100% | 100% |
| Shadow dilution with one mask | 65% | 60% |
| | 100%(with AICS Plus) | |
| Shadow dilution with tube and one mask | 65% | 60% |
| | 100%(with AICS Plus) | |
| Shadow dilution with two masks | 55% | 52% |
| | 100%(with AICS Plus) | |
| Shadow dilution with tube and two masks | 55% | 52% |
| | 100%(with AICS Plus) | |
| Ambient light | Green light ≤500Lux | Green light ≤500Lux |
| Power supply of all light sources | 55w | 50w |
| Power supply | 100VAC-240VAC, 50/60Hz | 100VAC-240VAC, 50/60Hz |
| Dimming range | 3-100% **** | 3-100% **** |
| Light head dimension | ≤700mm | ≤670mm |
| Standard features | iRelax, green ambient light, AICS Plus Stopless Rotation | Stopless Rotation |
| Optional functions | / | iRelax, green ambient light |
| Protection against harmful ingress of water or particulate matter | IP54 | IP54 |

* All values measured according to IEC 60601-2-41.

* Due to manufacturing and measuring tolerances, all data relating to lighting systems has a tolerance of +/- 10%.

** Max. patch light field diameter, D50/D10=70%.

*** Five ranks for variable color temperature 3,500/3,900/4,350/4,700/5,100K.

**** MIS Lighting mode included

HyLED X Series LED Surgical Lights

Lighten your work





Better Vision

In surgical procedure, the optical performance of surgical lamps may change the light field view due to the position of the surgeons or the various instruments used. This can affect the precision as well as efficiency of the Surgeon there by increase the risk and the duration of surgery. It is important to adopt new benchmark to have a stable and consistent optical performance of the surgical light.



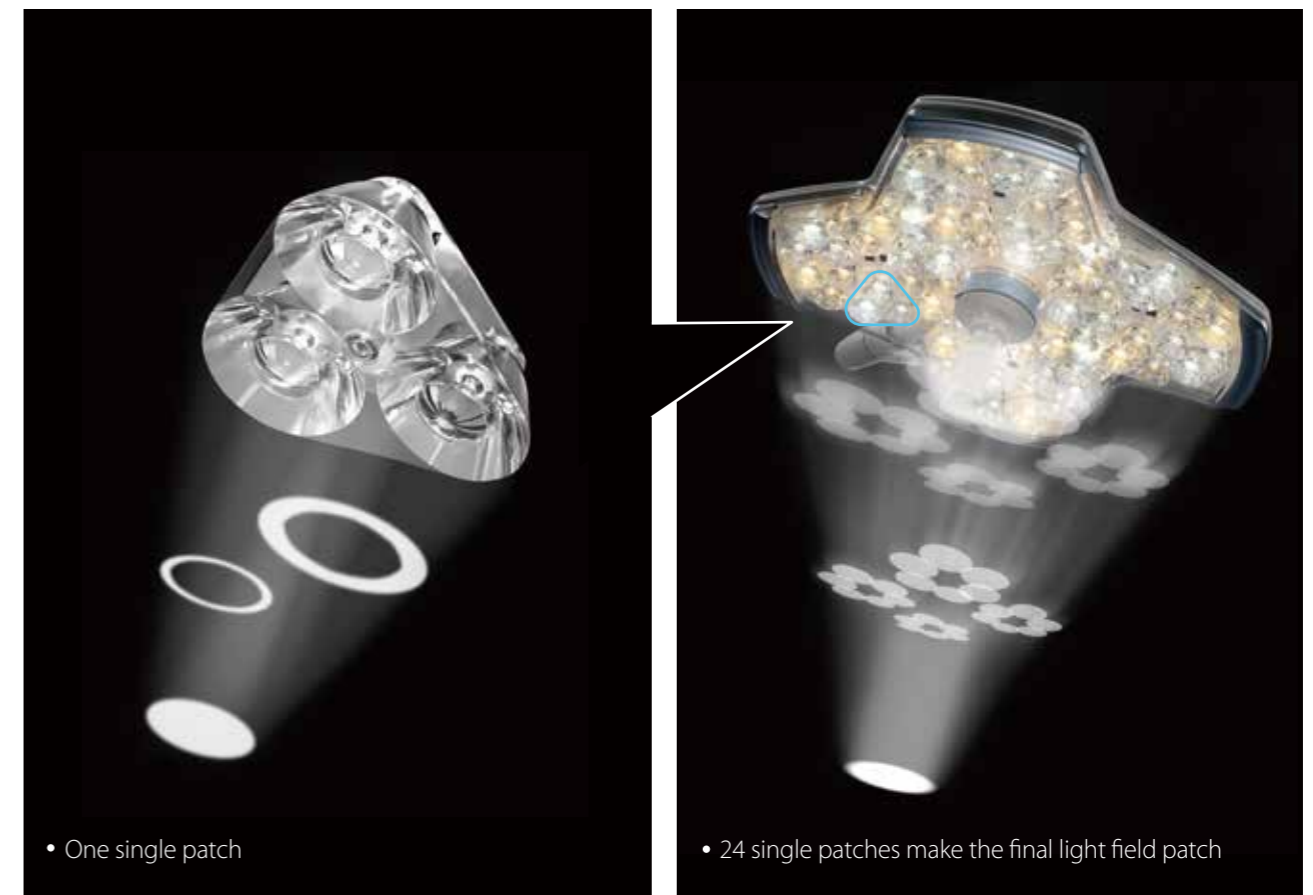
Multi-Patch Superposition Technology (MPST)

Homogeneous light field even when blocked by the surgeon's head

HylED X adopts the new Multi-Patch Superposition Technology (MPST) through innovative lens group design.

Each of lens group consists of several types of annular light spot, creating an individual and complete patch.

All the light patches will get superimposed at the operating field, generating uniform surgical light beam.



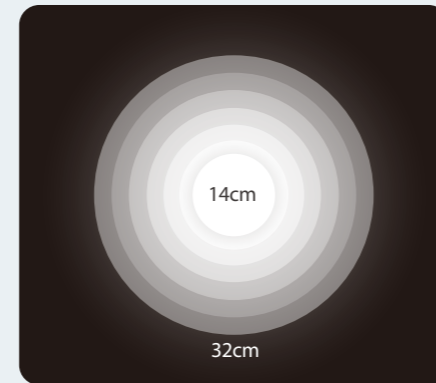
With tube and two masks light beam has a shadow dilution of 100% as well as the patch homogeneity D50/D10 reaches up to 70%. In practical, the innovative MPST allows surgeons to have a clear & homogeneous light field even if it's been obstructed by surgeons' heads.

When the optical path is blocked, the shape of the spot does not change, and there is no local dark area. Spot uniformity (D50/D10) reaches 70%

Wide Range Field Size Design

More Focus and Less Glare

For surgeries with tiny incisions, such as spine surgery and mitral valve replacement surgery, the light needs to be more focused and the glare from peripheral region should be less. With this innovative design lens efficiency is optimized and the luminous area is increased.



Active Shadow Management

Automatic Illumination Control System Plus (AICS Plus)

The illuminance of the operative field will be affected if it is blocked by surgeons' heads. In HyLED X, when a block is sensed, the main light will transmit a signal to the satellite light dome allowing both light heads to compensate the blocked illuminance. Specially designed software will ensure a smooth change in intensity without any flash effects.



Eye-relaxing light iRelax™

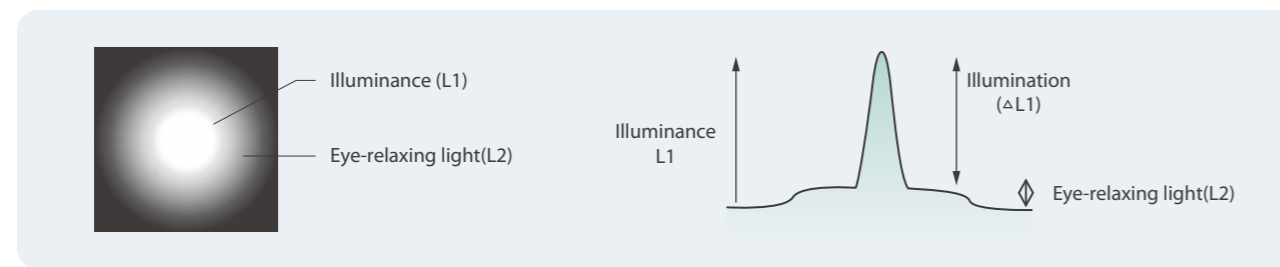
In clinical applications, visual fatigue is inevitable because medical staff continue to work under high intensity surgical lights for long time, and this intraoperative visual fatigue may also increases the chance of surgical errors.

Therefore, eye protection will also be a new criterion for surgical lights.

Combined with "eye-relaxing light" and "smooth brightness", the iRelax function of HyLED X will reduce the sensitivity of doctors to the illumination of surgical light, reduce their visual fatigue, and provide better light adaptation.

Eye-relaxing Light Reducing Eye Fatigue

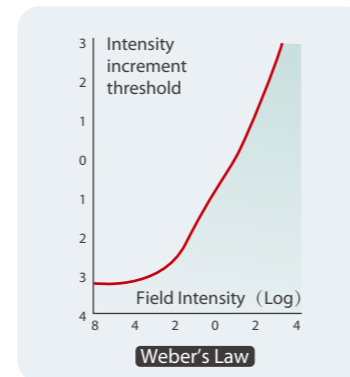
Eye relaxing light from HyLED X will reduce the contrast between the surgical site and peripheral region which reduces eye fatigue and improves visual performance. It provides a gradual transition between the focus illuminated surgical area and ambient lighting in the operating room.



The Illuminating Engineering Society of North America (IESNA) describes reducing contrast between the surgical site and peripheral region improve relaxing and visual performance. Ratios in excess of 40:1 can be suitable, but this ratio should be minimized wherever possible.

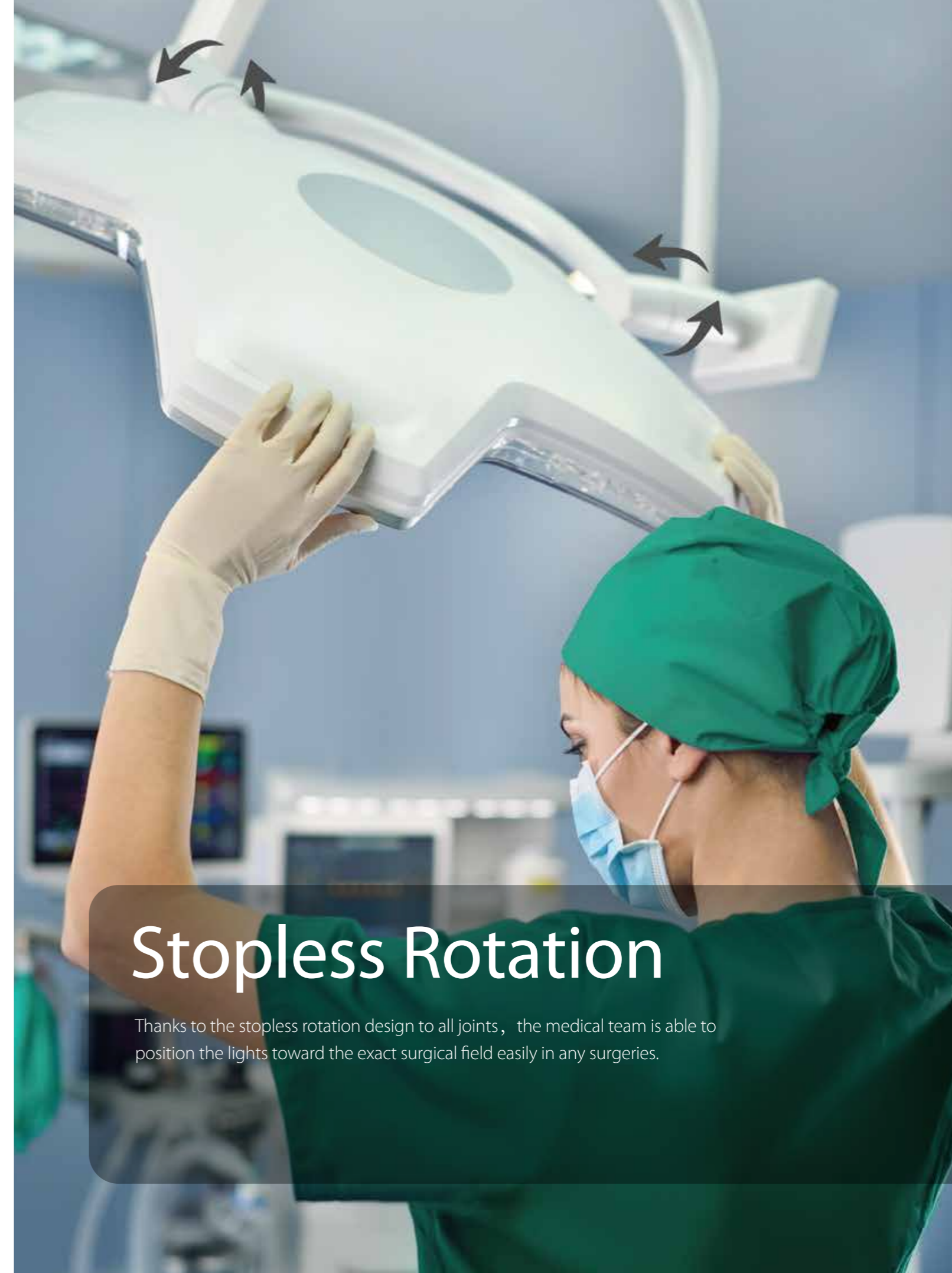
Smooth Brightness For Better Light Adaptation

HyLED X provides a smooth illuminance pattern when the surgical lights are switched on , it helps to adopt visual acuity as per Weber's law.



Color Temperature Distinguish Tissue Difference

The HyLED X light provides a light column with either a fixed daylight-like color temperature - 4,350K, or a color temperature variable from 3,500 - 5,100K in five ranks. This function is helpful to distinguish the difference between various tissue types and the perception of true tissue colors, which is used especially within cardiac surgery. Mindray offers a special light source system with a uniform mixed light of cool white LEDs and warm white LEDs to realize the color temperature adjustment.



Stopless Rotation

Thanks to the stopless rotation design to all joints, the medical team is able to position the lights toward the exact surgical field easily in any surgeries.

Easy to Adjust

Multifunctional Handle with Special Sensor Design

It allows the surgeons to control multiple functions directly with a synchronous notice on the field. A customized combination can be set among intensity, field diameter, color temperature, and MIS mode.



Low Resistance Joint Design

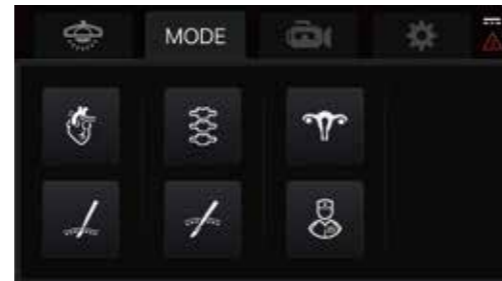
With a flexible bearing system integrated in the C-arm joint, it will be much easier to make the adjustment of light head.



Easy to Choose

Specialized Illuminance Modes

Illuminance requirements, in terms of size of incisions and depth of the operative field, vary with different surgeries. There are 6 options for different surgery mode in the HyLED X control system. One-button switchover to different surgery modes helps save clinical time with an intuitive & icon-based user interface touch screen.



Cardiac surgery



Deep cavity surgery



Superficial surgery



Spine surgery



Gynecologic/Urologic surgery



General practice

Easy to Change

Quick Lock System

Easily transition Integrated Camera and Camera preparation as you Surgical Lights between rooms with no special tools needed.



Mindray focuses more on the clinical requirement, designs it from perspective of medical staff, and reduces the cost of maintenance and service life of HyLED X

Safe and Durable

- Invisible screw and seamless design
- Easy to clean for better infection control
- Better Compatibility with Laminar Flow--DIN 1946
- Safe and durable--IP54
- Greater hygiene standards as Antimicrobial Powder Coating



Long Service Life

- LED service life 60000hr
- 5 years warranty for the LED bulbs



Workflow Management

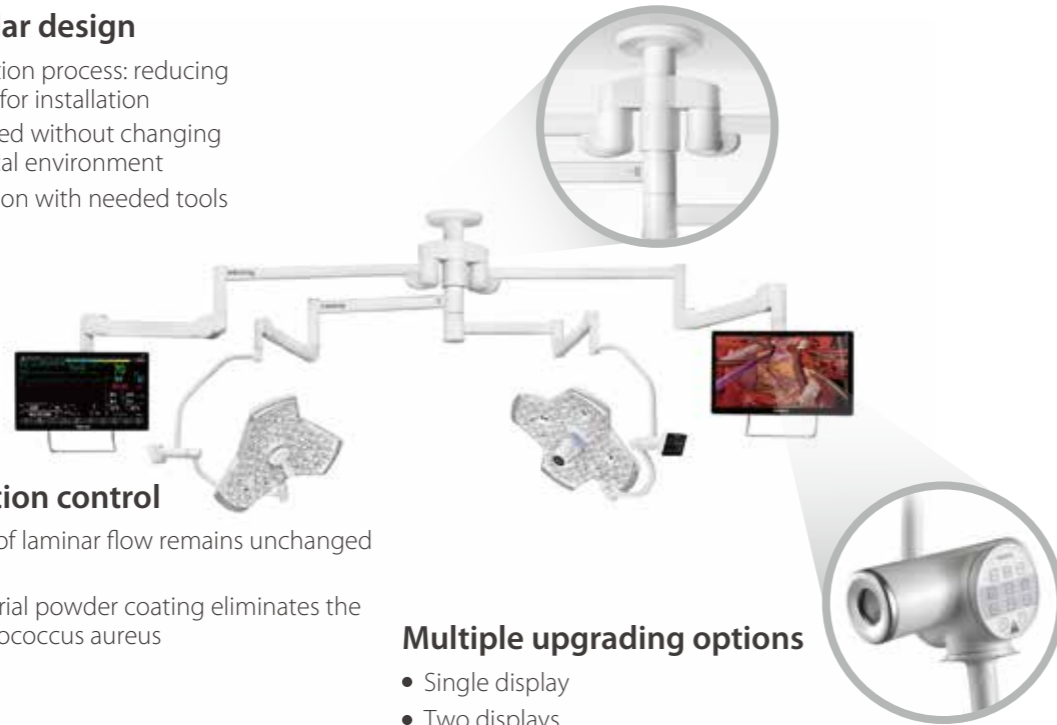
- Arc mask design, more focus on operation
- Anti-Flicker Design, no more eye fatigue
- C-arm handle, easy to control



Various Video Solutions

Flexible modular design

- Simplified installation process: reducing the time required for installation
- Upgrading achieved without changing the existing surgical environment
- Seamless integration with needed tools



Superior infection control

- The construction of laminar flow remains unchanged during installation
- Medical antibacterial powder coating eliminates the growth of staphylococcus aureus

Multiple upgrading options

- Single display
- Two displays
- Single display with Full HD/4K camera arm

Digital video recorder

- Supporting external USB storage device
- Supporting HDMI/YPbPr/HD-SDI/DVI-D/VGA input signal
- Default with camera control function
- Supporting video recording from other medical devices source



| | Wireless Camera | Wired Camera | 4K Camera |
|------------------|-----------------------------|--|-----------------------------|
| Picture Elements | 2-Mega pixel | 2-Mega pixel | 8-Mega pixel |
| Picture Quality | 1080p(1920x1080) | 1080p(1920x1080) | UltraHD(3840x2160) |
| Lens | f=4.7-47mm, F1.6-3.0 | f=3.8-38mm, F1.8-3.4 | f=4.4-88.4mm, F2.0-3.8 |
| Optical Zoom | 10x | 10x | 12x |
| Digital Zoom | 12x(120x with optical zoom) | 12x(120x with optical zoom) | 12x(240x with optical zoom) |
| Video Output | HMDI | HD-SDI | HDMI |
| Position | Integrated Camera | Carrier Arm Camera/ Integrated Camera | Carrier Arm Camera |

Wireless Camera

Wireless brings infinite Flexibility



Controller



Wall control

Touch screen control

Touch keypad control

wireless control APP

Other Accessories



Various handles flexibility

Sterilizable Handle(wireless,HyLED X)