

CR

Operation light

SKYLUX® YAMADA SHADOWLESS LAMP CO.,LTD.

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Providing an Optimal Light Environment to Every Medical Practice

Providing an Optimal Light Environment to Every Medical Practice



Yamada Shadowless Lamp found one light.

“Medical LEDs.”

This light is close to natural light. “An accurate but gentle light.”

A doctor’s eyes are just as important to them as their hands.

They are always looking at the patient’s ever-changing condition.

In the operation room, their eyes are continually strained under operation lights, brighter than sunlight.

We don’t want doctors to just accept that harsh environment and daily stress as unavoidable.

We don’t want doctors to pretend they don’t feel it.

The CRYSTAL series is not only an operation light, but is fully equipped with “Medical LEDs” for all lights that envelop the entire space.

We’re on a mission.

We want to provide an optimal light environment to every medical practice.

To help doctors do their best. To help save lives.



CR

Operation light CRYSTAL series

Sophisticated design

Standard model with a light-weight, thin design, equipped with “Medical LEDs”.
SKYLUX CRYSTAL has evolved.



*The airflow is an illustration.

Smooth airflow

We used a design that ensures a path for airflow.
This allows for a constant stream of pure air to be sent to the operation site during the operation without blocking the air from the ceiling.



Light field adjustment

Just turn the sterile center handle to adjust the size of the light field based on the operative field.
You can freely adjust the light field from 8 levels.



Side panel

You can use the side panel on the light head or the wall panel / box to turn the power on or off, adjust the brightness (from 1 to 8), and adjust the light field (from 1 to 8).



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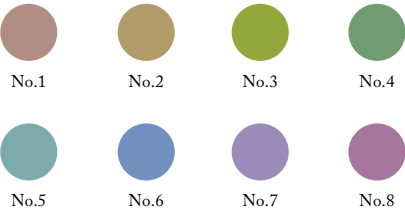
Operation light CRYSTAL series

We achieve a light environment optimal for medical practices.

“Ultra-high color rendering LEDs” achieve reliable visibility and distinguishability

We used “Ultra-high color rendering LEDs” to achieve a high index of 95 for the R9 value. This corresponds to red (blood) in the special color rendering index (Ri), an index that includes colors close to the human body. This makes the colors of blood, organs, and tissue in the operative field more visible and distinguishable, helping improve the precision of operations.

Average color rendering index (No.1 to 8)



Special color rendering index (No.9 to 15)



Light which brings out an object’s true color and quality

Compared to ordinary LEDs, Medical LEDs have a spectrum closer to that of sunlight, and can bring out an object’s true color and quality. Human eyes see the light reflected off an object to recognize that object. Medical LEDs can express that reflection more accurately and illuminate more true.

Comparison of ordinary and Medical LEDs



With ordinary LEDs

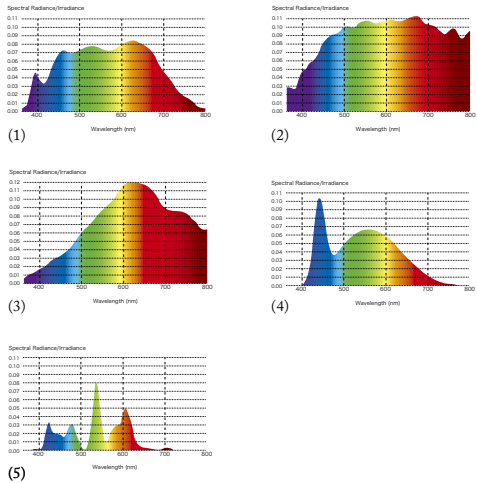
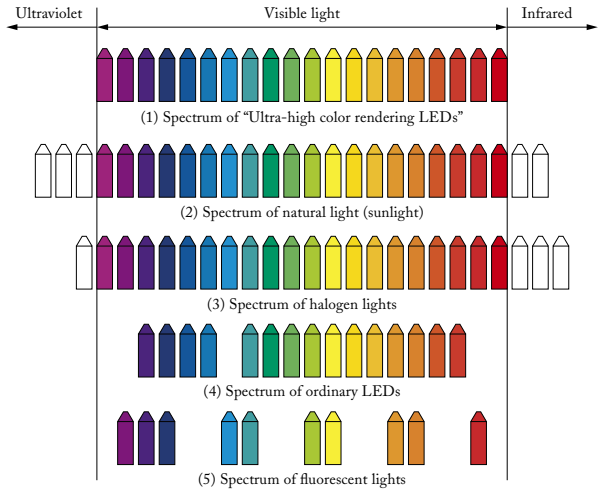


With Medical LEDs

Spectral wavelength range close to sunlight

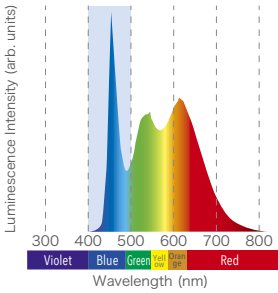
For example, you can’t draw a colorful picture with only one or two colored crayons. If you don’t have a skin-colored crayon, you have to use the next closest color, yellow, and the picture ends up different from what you imagined. In the same way, by illuminating light with a spectrum that covers all wavelengths onto an object, that object’s true, natural colors become visible.

If we imagine the spectrum of light as crayons...

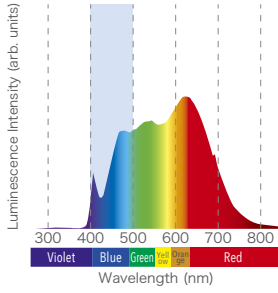


Light that is gentle on your eyes with reduced risk of blue light

Doctors who continue to look at an operation site under an abnormally bright light experience tired eyes due to blue light. “Medical LEDs” reduce the blue light risk and achieve a spectrum that does not strain the eyes.



Radiant spectrum of ordinary white LEDs

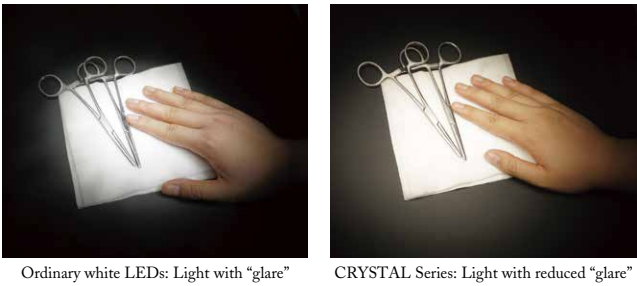


Radiant spectrum of the “Ultra-high color rendering LEDs” used in the CRYSTAL Series

Adverse effects on human bodies that are considered due to the risk of blue light	
Retinopathy	The “macula” (yellow spot in the centre of retina) can be damaged and may cause macular degeneration (AMD) that increases with old age.
Eye strain and stiff shoulders	The blue light has a short waveform and tends to be diffused. This causes glare and flicker, which often results in difficulty in focusing for human brain. The blue light has stronger energy than the lights so that the muscles of eyes can also be strained in the effort of reducing the size of pupils. These may cause strain of the eyes and stiffness in the shoulders and neck.
Sleeping disorder	If retina is damaged by the blue light, it is said that the melatonin secretion becomes lower and disturbs circadian rhythm, which eventually may lead to sleeping disorder.

Low-glare light that makes the operation site visible and improves operation efficiency

The unique optical design prevents glare when illuminated on the operation site. This significantly reduces eye strain and discomfort for doctors, who must continue to look at the operation site over a long period of time.

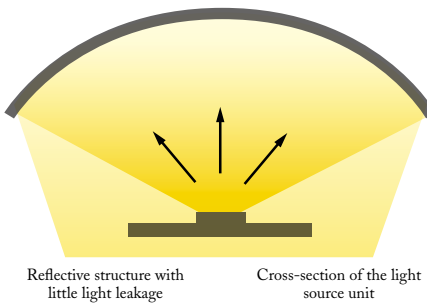


Ordinary white LEDs: Light with “glare”

CRYSTAL Series: Light with reduced “glare”

Light unit which reduces brightness

The light unit is designed to have a structure that prevents the LEDs from interfering with your work. This structure prevents the physician and support staff from feeling uncomfortable brightness.



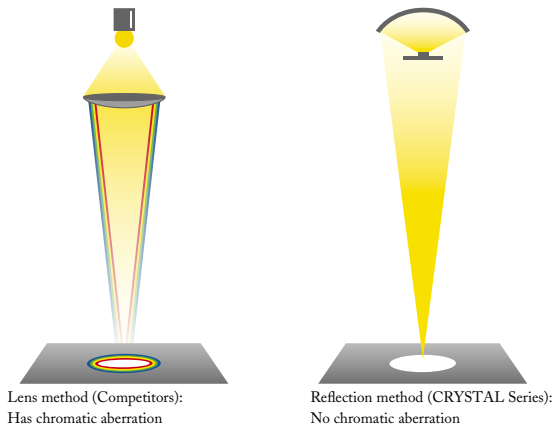
Reflective structure with little light leakage

Cross-section of the light source unit

Difference in illumination techniques

The unique structure of the light unit prevents “chromatic aberration” (that is, blurring or shifts in color) so you can accurately see the operation site.

- Lens method (Competitors)
Because refraction indexes vary by wavelength, chromatic aberration occurs, shifting or blurring the color in the edges of the light field.
- Reflection method
Luminescent method of the CRYSTAL Series. Chromatic aberration does not occur in the edges of the light field.

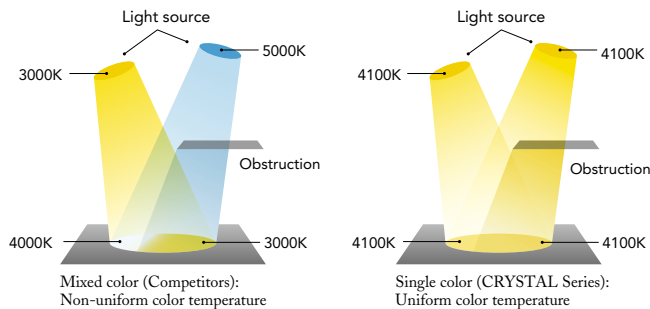


Lens method (Competitors):
Has chromatic aberration

Reflection method (CRYSTAL Series):
No chromatic aberration

Maintaining a uniform color temperature

When mixing LED elements with varying color temperatures, a uniform color temperature cannot be maintained, such as how color shadows are formed when the light is blocked. With CRYSTAL Series, single color LED elements allow for accurate color detection.



Mixed color (Competitors):
Non-uniform color temperature

Single color (CRYSTAL Series):
Uniform color temperature

CR07 (CRV07)



CR04 (CRV04)



CR0404 (CRV0404)



CR0704 (CRV0704)



CR04-MH (CRV04-MH)



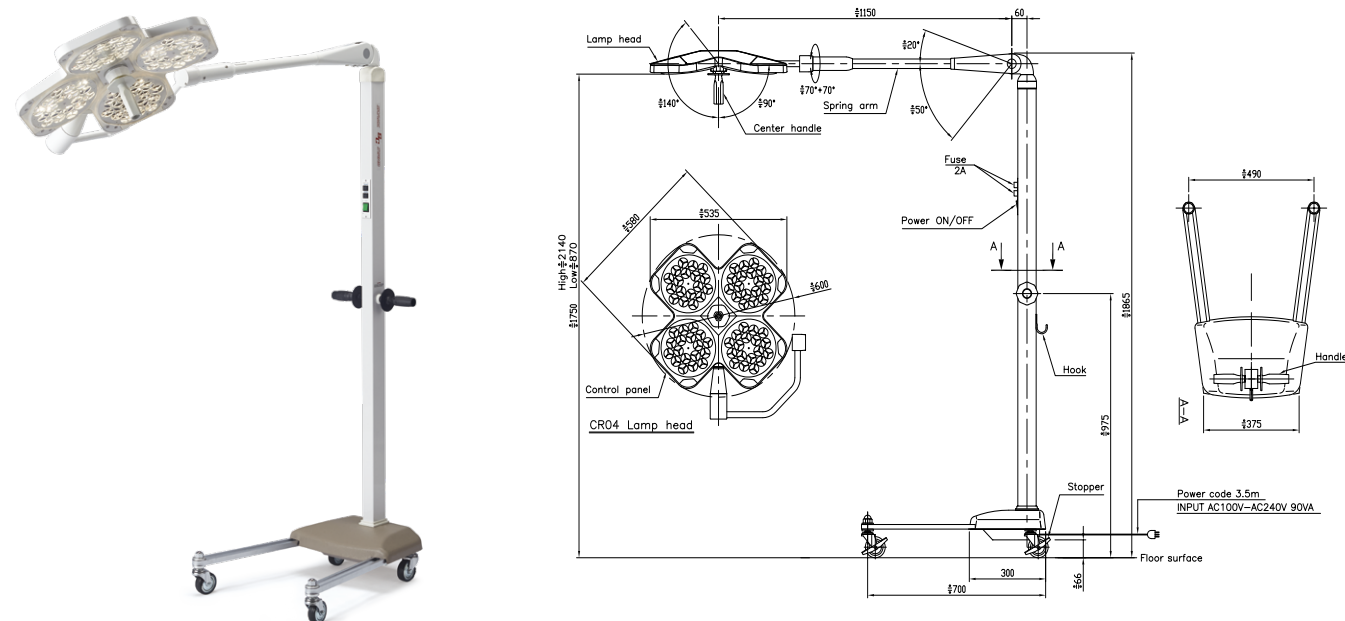
CR07-TV55MY (CRV07-TV55MY)



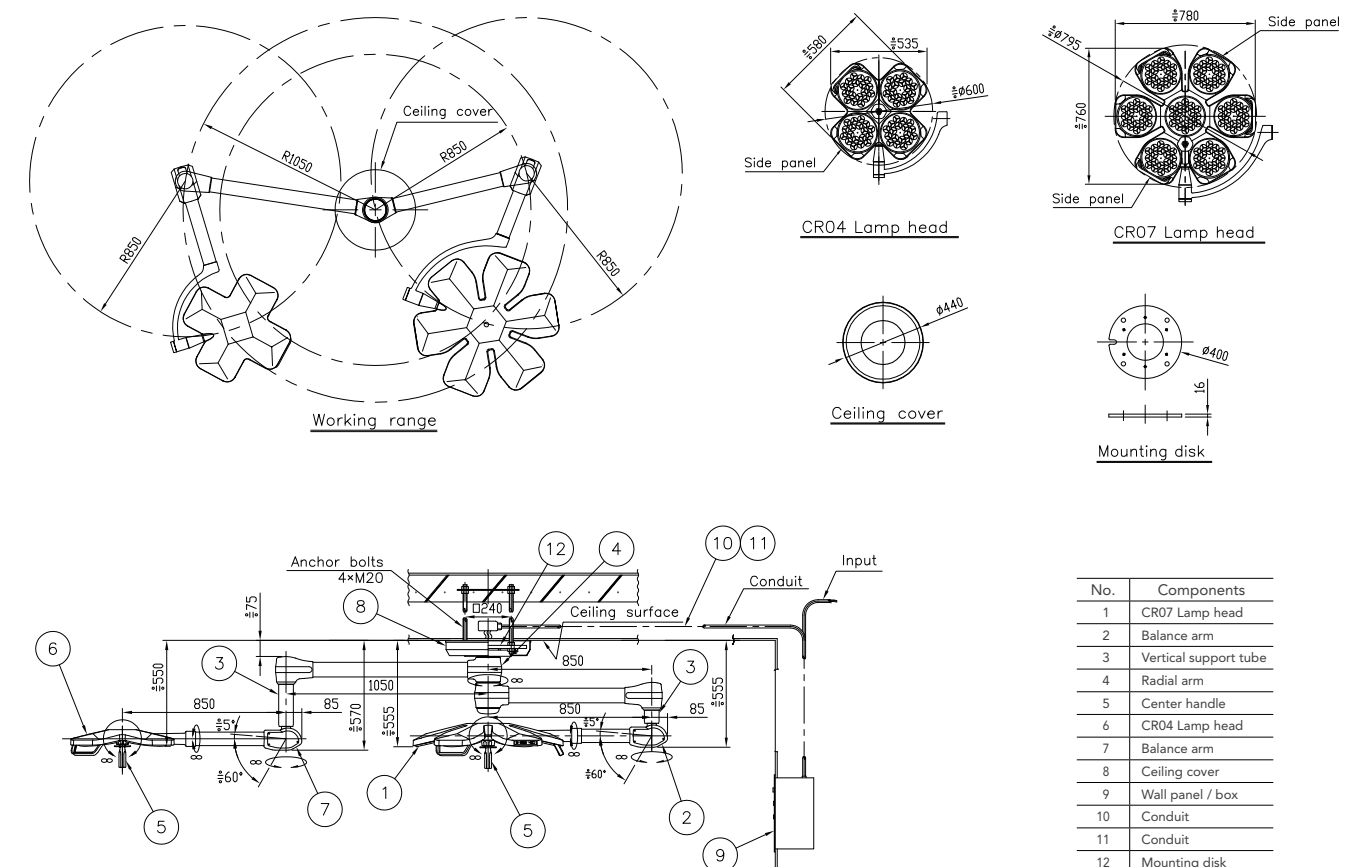
* Other configurations can be arranged to meet your installation plan. Please feel free to contact us.
* For details about the TV camera mounted arm or monitor mounted arm, please refer to the separate information.

Mobile stand type

This is a mobile type that allows for flexible use when necessary, such as an auxiliary light during operation or for emergency treatment.



External drawing



WALL PANEL / BOX

WALL PANEL & BOX

CRYSTAL Series can be operated using the WALL PANEL / BOX or the side panel on the lamp head.

You can use the side panel on the lamp head or the wall panel/box to turn the power on or off, adjust the brightness (from 1 to 8), and adjust the field (from 1 to 8).

- External dimensions
WALL PANEL / BOX : W280 × H280 × t1.5 mm
Or: W300 × H400 × t1.5 mm

CR Series

You can adjust the settings using the WALL PANEL / BOX or the side panel on the lamp head.

CRV Series

As a WALL PANEL / BOX is not installed, adjustments can be made using the side panel on the lamp head.



Side panel



WALL PANEL / BOX

Specifications

Item / Model	CR07(CRV07)	CR04(CRV04)	CR04SC
Composition	Lamp head + Radial arm + Vertical support tube with Balance arm +Wall panel/box		Lamp head + Spring arm + Stand pole + Stand base
Light head diameter	Approx. 780 mm	Approx. 580 mm	
LED technology	“Ultra-high color rendering LEDs”		
Illumination method	Reflection method		
Number of LED units and LED devices	LED units:7 LED devices: 126	LED units:4 LED devices: 72	
Central illuminance (Ec / at 1 m)*1	140,000Lux	100,000Lux	
Irradiance (at 1 m)	520W/m ²	370W/m ²	
Light field diameter (d10)	φ120 to 180 mm (8 levels)		
Color temperature (K)	4,100±150K		
Color rendering index	Ra: 95 (Typical value), R9: 95 (Typical value)		
Adjustment range of light intensity	8 levels (from 30 to 100%), on the WALL PANEL / BOX or side panel		8 levels (from 30 to 100%), on the side panel
LED service life	40,000 hours (Up to 70% light intensity)		
Possible environmental conditions	Ambient temperature: 5 to 35°C, Relative air moisture: 30 to 70%, Air pressure: 800 to 1,060 hPa		
Rated input voltage	AC100-240V 50/60Hz		
Power consumption	115VA (MAX)	85VA (MAX)	
Fuse rating	3.15A	2A	
Light field adjustment switch	Sterile center handle + Side panel + WALL PANEL / BOX		Sterile center handle + Side panel

* Product design and specifications are subject to change without prior notice due to product improvements, etc.