



Thank you for purchasing a CCS product. To ensure proper use of the product, please read this instruction guide before use and keep it for your future reference.






1 Important Information for Equipment Safety - Read Before Use -






These products have been designed with full consideration of safety. However, incorrect usage of the products may result in fire, electric shock, or other serious damages. Please ensure to follow the conditions below.





The following symbols are used in this instruction guide to indicate and classify the relative importance of warnings and cautions.

 Warning	Indicates that incorrect usage may result in serious injury or death.	 Caution	Indicates that incorrect usage may result in injury or property damage.
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The following symbols in the Instruction Guide indicate and classify the precautions.

 PROHIBITED	 DISASSEMBLY PROHIBITED	 DO NOT TOUCH WITH WET HANDS	 DO NOT SUBJECT TO MOISTURE	 MANDATORY ACTIONS
These symbols indicate prohibited actions.				This symbol indicates required actions.

 Warning	
Do not disassemble or modify the Light Unit. Doing so may result in fire or electric shock.	LED Light radiation may cause corneal or retinal abnormalities if you look directly at the light. To prevent harmful light exposure, never look directly at the LED Light. 
Do not touch the Light Unit with wet hands. Doing so may result in electric shock.	This Light Unit generates high temperatures. Do not touch the Light Unit while it is turned on or immediately after it is turned off, or burning may result. Provide cooling with a fan or other ventilation if the Light Unit is to be used in a closed space. 
Make sure that the Light Unit is free of moisture or any liquid. Exposure to water may result in fire, electric shock.	Connect or disconnect the light cable only after turning off the power source. Failure to do so may result in circuit damage, fire caused by a minute spark, or electric shock. 
If abnormal condition occurs such as fuming, heat, smell, noise, or so on, stop using the Light Unit immediately, and turn off the power source. A fire or electric shock may result if the Light Unit is kept used.	Using Infrared Light Units (LFXV-nnnIR860) Make known to all personnel concerned the risk of infrared radiation. Failure to do so may cause incorrect handling. 

 Caution	
Do not use user-made cables. Doing so may cause product failure. Use the CCS extension cable if it is necessary to extend the distance between the Light Unit and the Control Unit.	Use Control Unit that is suitable for the Light Unit ratings. Using an incorrect Control Unit can cause Light Unit failure. 
Be careful of static electricity. Damage to the LED Light may occur, if a person charged with static electricity touches it. Keep the product away from all items charged with static electricity.	Use a standard Extension Cable that is manufactured by CCS. However, if the cable is too long, the light intensity will decrease due to the DC resistance of the cable. 
Do not drop the Light Unit or subject it to impact. Doing so may cause the Light Unit to malfunction.	

Do not use the Light Unit in the following situations.

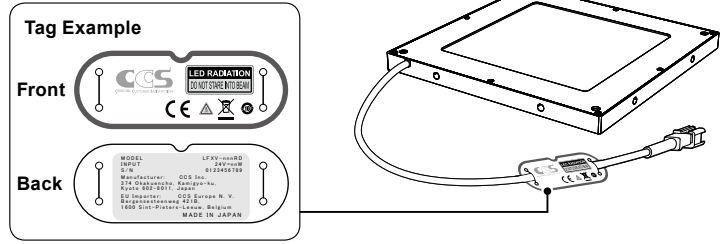
- Under conditions or in an environment not described in this instruction guide.
- In nuclear energy control systems, railroad systems, aviation systems, vehicles, combustion equipment, medical equipment, amusement machines, or safety equipment.
- In applications involving serious risk to life or property, particularly applications demanding a high level of safety.

Please install the Light Unit to locations with following conditions. Incorrect installation location may cause Light Unit failure.

- In a flat and stable location with minimal vibration.
- Well-ventilated places with minimal dust.
- Places that are not subject to sudden temperature changes.
- Places free from any water, oil, liquid, chemical, or steam.
- Places free from corrosive or combustible gas.
- Places away from water faucets, boilers, humidifiers, air conditioners, heaters, or stoves.

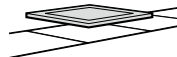
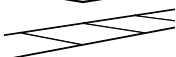
2 Confirming Product Information

The following tag is attached to the cable on the LED Light. The color of the label indicates the luminescence color of the Light Unit. The back of the tag there is a name label that gives the model number, power consumption, and serial number. Be sure to check the contents before using the Light Unit and handle the label with care. If the label is missing or damaged and the contents cannot be checked, please contact CCS Inc.



3 Features

This Light Unit has both dome illumination and coaxial illumination characteristics. To obtain the optimum images, refer to the following.

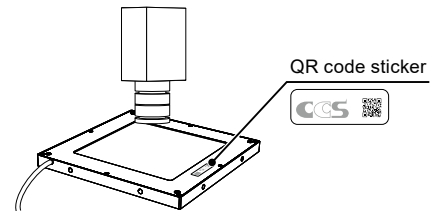
<p>Characteristics for Dome Illumination</p> <p>Use of diffused light eliminates shadows in curved surfaces or parts.</p> 	<p>Characteristics for Coaxial Illumination</p> <p>Highly reflective surface is uniformly illuminated.</p> 
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Recommended Applications


Category	Recommendation	Application
Visual inspection	Optimal	Inspecting the appearance of curved, irregular, or flat glossy objects (detecting scratches, dirt, scorching, breaking, or chipping, distinguishing different shapes and presence/absence, inspecting surface conditions)
Character recognition	Suitable	Character recognition on glossy objects. Bar codes and 2-dimensional codes.
Measurement	Usable	Dimensional measurement

4 Installation

This Light Unit has two faces. The surface affixed with a QR code sticker must face the camera when you install the Light Unit. Also, these two surfaces are identified by the difference in the position of the screws. For information on the dimensions of each part, refer to 8. Dimensions.




5 Operating Instructions

 Make sure that the Control Unit is turned OFF before connecting.

1 Connect the light cable of the Light Unit to the Control Unit.
Connect to the Control Unit equipped with **SMP-03V-BC** Connectors for power output. Insert the plug all the way into the connector.

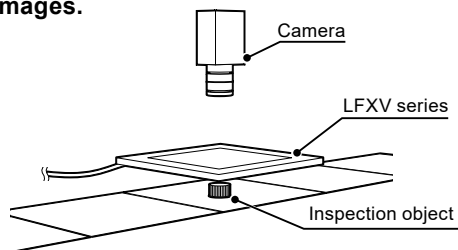
For information on applicable Control Units and cables, refer to the product catalogs or the CCS website.

 **Caution** **Using Infrared Light Units (LFXV-nnnIR860)**
Do not expose human eyes to infrared radiation. Also, make known to all personnel concerned the risk of infrared radiation.

2 Turn ON the Control Unit to turn ON the Light Unit.
Read the instruction guide of the Control Unit before use.

5 Operating Instructions (Continued)

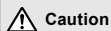
3 Adjust the illuminating distance and radiant quantity to optimize images.



- Imaging example -

Using Infrared Light Units (LFXV-*nnn*IR860)

The LEDs that appear to be not lit radiate infrared light. Do not look at the radiated light directly with your naked eyes. To check for LED radiation, use a camera to look at the LEDs indirectly. You can also look at the LEDs through the LCD monitor on a normal digital camera or cellphone.



Caution

To Obtain the Optimal Image

When the ambient light is reflected from the surface of the Light Unit or the surface of the inspection object, the captured image may be affected.

Methods for preventing the effects of ambient light

- Prevent ambient light from entering with a hood or the like.
- If using red light, equip a Sharp-cut Filter to the lens.
- Increase the camera's shutter speed. (Increase the Light Unit intensity somewhat.)

Dirt or dust on the surface of the Light Unit may affect the captured image.

Dirt and dust removal methods

- Handle the Light Unit with care. Make sure no dirt, dust, or fingerprints get on the Light Unit.
- Remove dirt and dust by blowing air rather than by hand.
- Use a soft, finely woven cloth to wipe away any marks such as fingerprints.
- Use diluted neutral detergent to remove any heavy dirt. Do not use chemicals such as alcohol for the emitting surface.

Image irregularities and moire* may occur due to the dot pattern on the light-guiding diffusion plate.

* moire: A periodic stripe pattern made as a result of mutual interference between the geometric dot pattern of the Light Unit and the pixel pattern of the light receiving element in the camera.

How to decrease image irregularities and luminescent spots caused by the dots

- Open the lens somewhat wider than the normal.
- Match the focus to the target inspection object.
- Adjust the position of the Light Unit (set outside of the depth of field).
- Adjust the Light Unit intensity (prevent reflection and glare).
- If there is too much light, increase the camera's shutter speed.

Luminescent spots may result from foreign matter contained in the light-guiding diffusion plate, but these are within the CCS inspection range and do not constitute a malfunction.

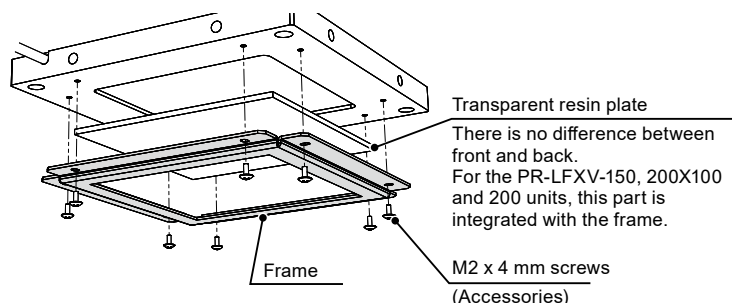
6 Optional Accessories (Sold Separately)

The following products are available for the LFXV-series Light Units. Obtain the required product.

Protective Plate PR-LFXV Series

Protects the light-guiding diffusion plate of the Light Unit. It is not available to use this product for protection use from any damages caused by dust, water and etc.

Model name	Applicable Light Units	Frame dimensions	Weight	Accessories
PR-LFXV-50	LFXV-50 series	86 x 86 x 3.5 mm	25 g	M2 x 4 mm screws x 9 pcs.
PR-LFXV-75	LFXV-75 series	111 x 111 x 3.5 mm	40 g	M2 x 4 mm screws x 9 pcs.
PR-LFXV-100	LFXV-100 series	136 x 136 x 3.5 mm	60 g	M2 x 4 mm screws x 13 pcs.
PR-LFXV-150	LFXV-150 series	186 x 186 x 8.2 mm	155 g	M2 x 4 mm screws x 13 pcs.
PR-LFXV-200X100	LFXV-200X100 series	236 x 136 x 8.2 mm	150 g	M2 x 4 mm screws x 15 pcs.
PR-LFXV-200	LFXV-200 series	236 x 236 x 8.2 mm	220 g	M2 x 4 mm screws x 17 pcs.



7 Main Specifications

Common Specifications

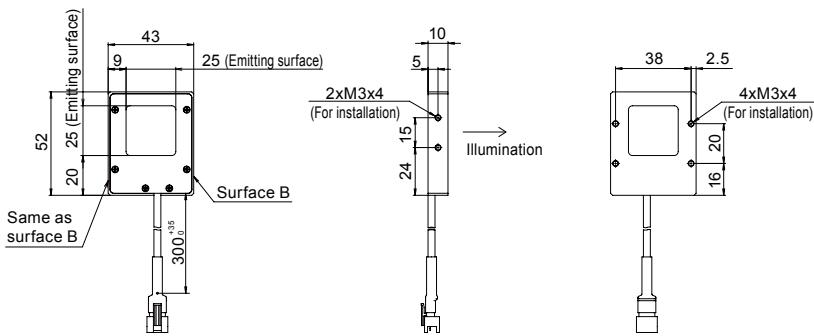
Input voltage	24 VDC
Peak wavelength / correlated color temp. (typ.)	Red: 630 nm, White: 5,500 K, Blue: 465 nm, IR: 855 nm
Connector	SMR-03V-B
Polarity, signal	1: (+), 2: NC, 3: (-)
Cable length	300 mm
Cooling method	Natural air-cooling
Operating environment (indoors only)	Temperature: 0 to 40°C, Humidity: 20 to 85%RH (with no condensation)
Storage environment	Temperature: -20 to 60°C, Humidity: 20 to 85%RH (with no condensation)
CE marking	Safety standard: Conforms to EN 62471
Case material	Aluminum alloy, Resin (protective plate, light-guiding diffusion plate)
Accessories	Instruction guide

Specifications by Model

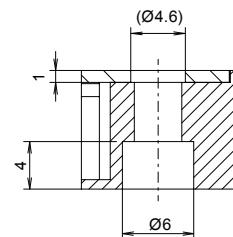
Model name	LED color	Power consumption (max.)	Weight (max.)
LFXV-25RD	Red	1.2 W	80 g
LFXV-25SW	White	1.3 W	
LFXV-25BL	Blue	1.2 W	
LFXV-25IR860	Infrared	1.2 W	190 g
LFXV-50RD	Red	9.1 W	
LFXV-50SW	White	9.9 W	
LFXV-50BL	Blue	9.3 W	
LFXV-50IR860	Infrared	5.7 W	290 g
LFXV-75RD	Red	14 W	
LFXV-75SW	White	15 W	
LFXV-75BL	Blue	14 W	
LFXV-75IR860	Infrared	12 W	400 g
LFXV-100RD	Red	16 W	
LFXV-100SW	White	20 W	
LFXV-100BL	Blue	19 W	
LFXV-100IR860	Infrared	12 W	870 g
LFXV-150RD	Red	28 W	
LFXV-150SW	White	30 W	
LFXV-150BL	Blue	28 W	
LFXV-150IR860	Infrared	17 W	870 g
LFXV-200X100RD	Red	23 W	
LFXV-200X100SW	White	30 W	
LFXV-200X100BL	Blue	28 W	
LFXV-200X100IR860	Infrared	17 W	1300 g
LFXV-200RD	Red	31 W	
LFXV-200SW	White	40 W	
LFXV-200BL	Blue	38 W	
LFXV-200IR860	Infrared	23 W	1300 g
LFXV-300X100RD	Red	31 W	
LFXV-300X100SW	White	40 W	
LFXV-300X100BL	Blue	38 W	
LFXV-300X100IR860	Infrared	23 W	1600 g
LFXV-300X200RD	Red	38 W	
LFXV-300X200SW	White	50 W	
LFXV-300X200BL	Blue	47 W	
LFXV-300X200IR860	Infrared	29 W	2000 g
LFXV-300RD	Red	46 W	
LFXV-300SW	White	60 W	
LFXV-300BL	Blue	56 W	
LFXV-300IR860	Infrared	34 W	

8 Dimensions (mm)

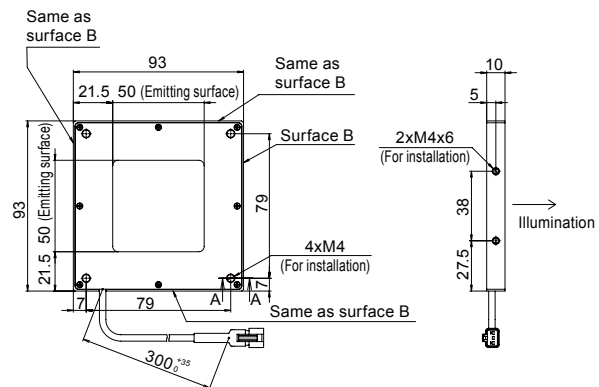
LFXV-25RD/SW/BL/IR860



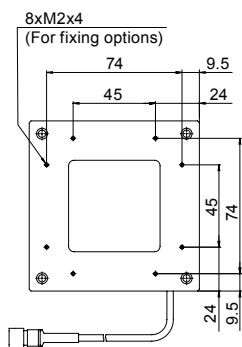
Detailed Diagram of Surface A-A



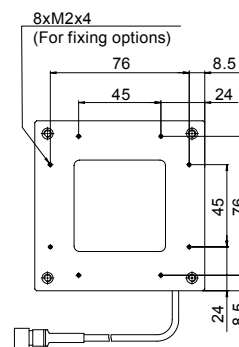
LFXV-50RD/SW/BL/IR860



For LFXV-50RD/SW/BL

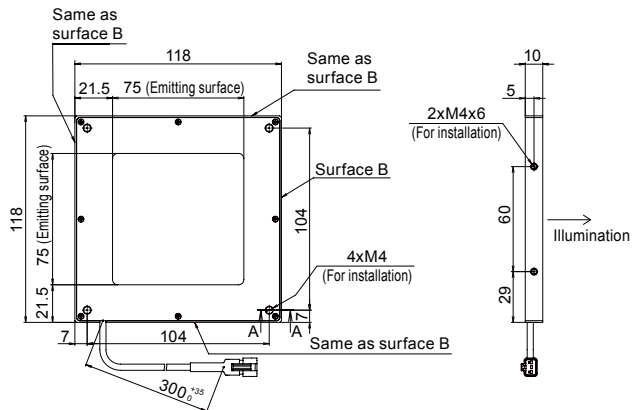


For LFXV-50IR860

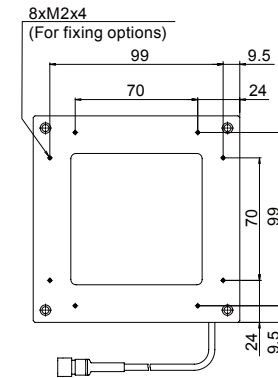


See Detailed Diagram of Surface A-A in the upper-right column on this page.

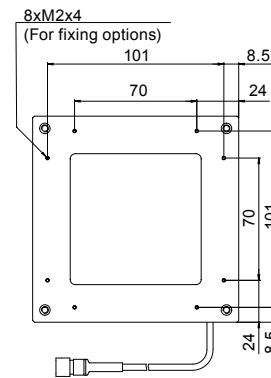
LFXV-75RD/SW/BL/IR860



For LFXV-75RD/SW/BL

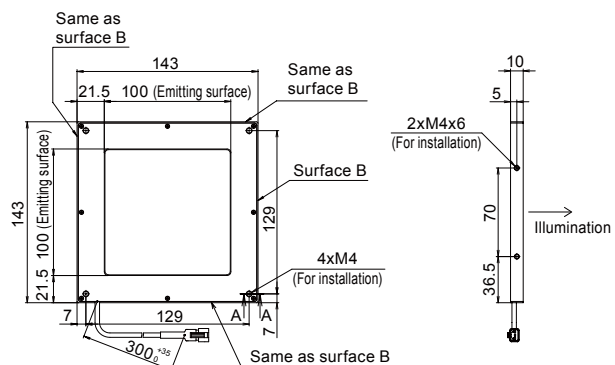


For LFXV-75IR860

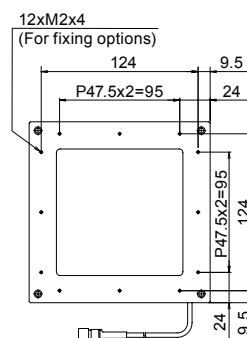


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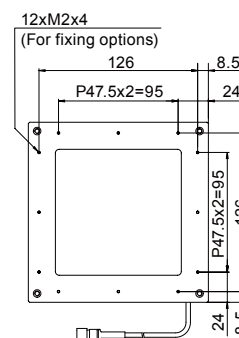
LFXV-100RD/SW/BL/IR860



For LFXV-100RD/SW/BL

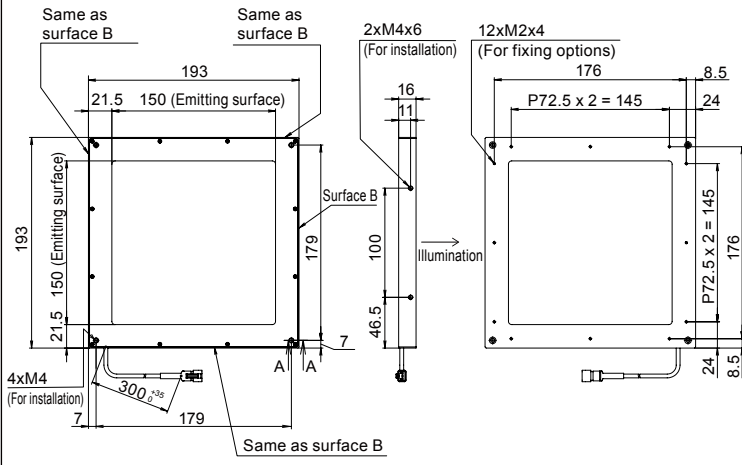


For LFXV-100IR860



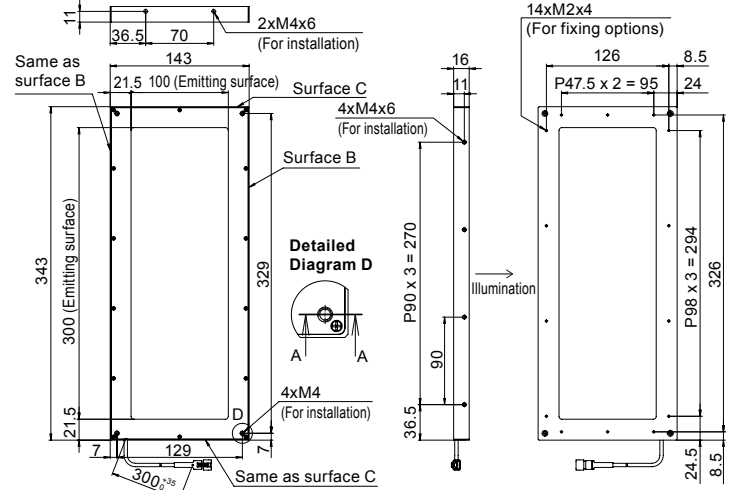
See Detailed Diagram of Surface A-A in the upper-right column on this page.

LFXV-150RD/SW/BL/IR860



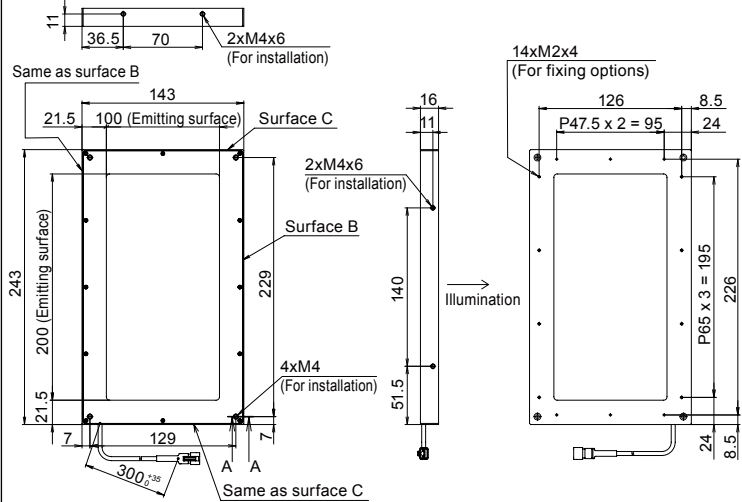
See Detailed Diagram of Surface A-A in the lower-left column on this page.

LFXV-300X100RD/SW/BL/IR860



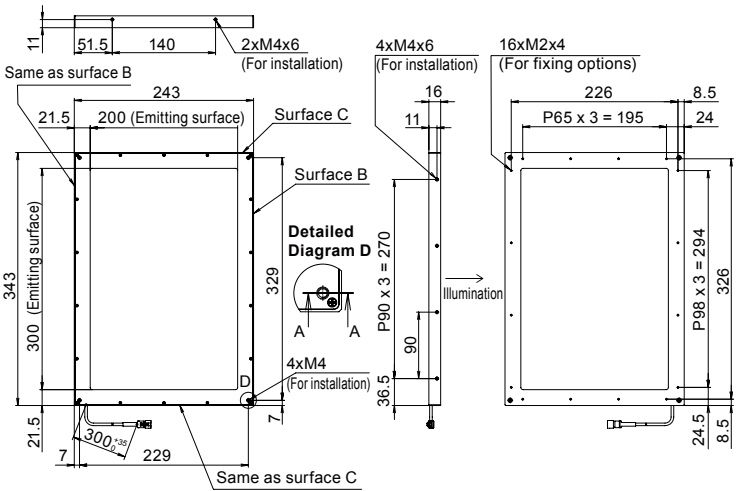
See Detailed Diagram of Surface A-A in the lower-left column on this page.

LFXV-200X100RD/SW/BL/IR860



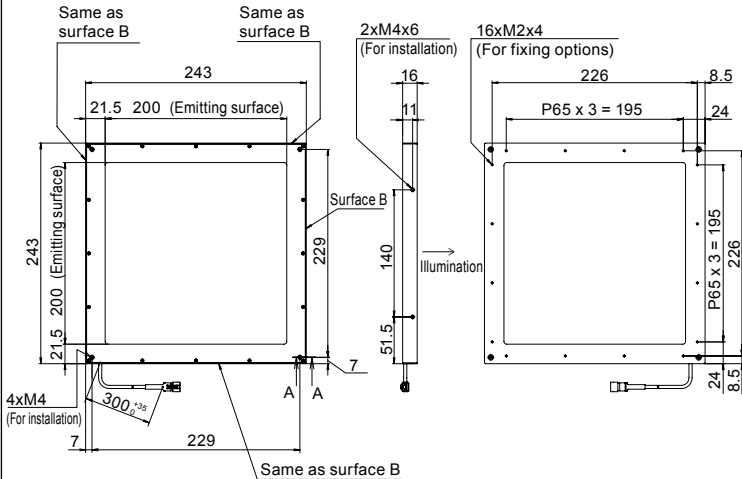
See Detailed Diagram of Surface A-A in the lower-left column on this page.

LFXV-300X200RD/SW/BL/IR860



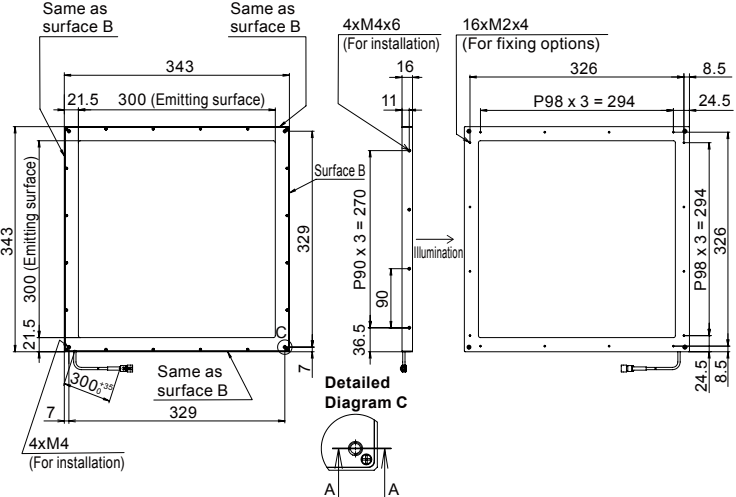
See Detailed Diagram of Surface A-A in the lower-left column on this page.

LFXV-200RD/SW/BL/IR860



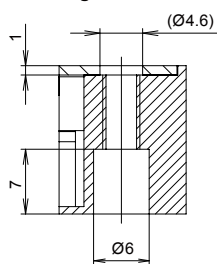
See Detailed Diagram of Surface A-A in the lower-left column on this page.

LFXV-300RD/SW/BL/IR860



See Detailed Diagram of Surface A-A in the lower-left column on this page.

Detailed Diagram of Surface A-A



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