

LFX3(A) Series

Instruction Guide



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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 -


This product has been designed with full consideration of safety. However, incorrect usage of the product 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.	

 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.

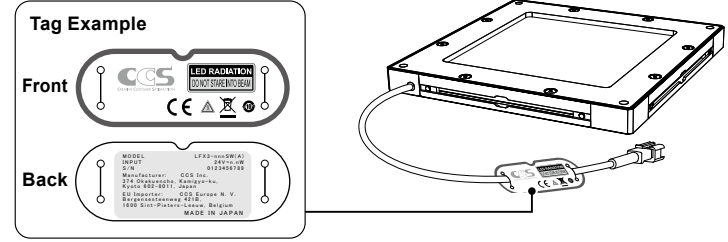
 - Under conditions or in an environment not described in this instruction guide.
 - In nuclear energy control systems, railroad systems, aviation systems, vehicles, combustion equipment, medical equipment, amusement machines, or safety equipment.
 - In applications involving serious risk to life or property,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

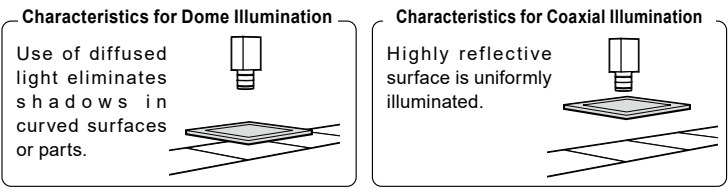
2 Confirming Product Information

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.



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. Install the Light Unit so that it faces in the correct direction.

- Camera side: The emitting surface appears transparent when the Light Unit is turned OFF. This side must face the camera.
- Light projection side: The emitting surface appears translucent white when the Light Unit is turned OFF. This side must face the inspection object. When the Light Unit is turned ON, light will be projected from this side.

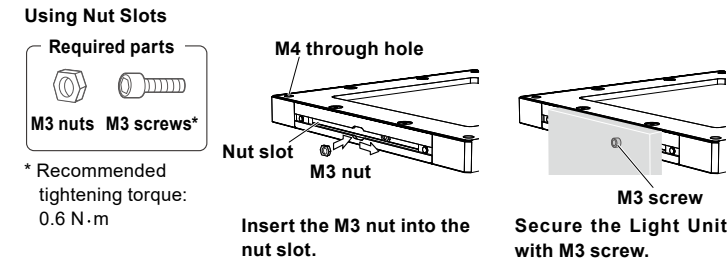
The installation method depends on the model of the Light Unit. For information on the dimensions of each part, refer to 9. *Dimensions*.

LFX3-25(A)-series Light Units

Use the M3 screw holes (Insertion depth: 4 mm) at the light projection side face and the lateral side of the Light Unit.


Light Units from Other Series

Use the M4 through holes at the four corners of the square face. Additionally, you can use the nut slots on the lateral side of the Light Unit.



Determine the length of the screws considering the dimensions of the M4 through holes and nut slots. For detailed information, refer to the end of 9. *Dimensions*.

5 Operating Instructions

 Make sure that the Control Unit for the LED Lights is turned OFF.

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.

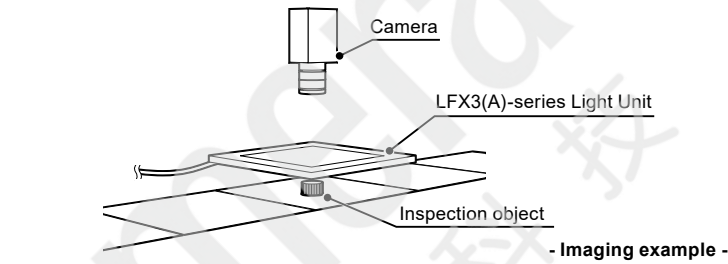
For information on applicable Control Units and cables, refer to the product catalogs or the CCS website.

2 Turn ON the Control Unit to turn ON the Light Unit.

Read the *Instruction Guide* of the Control Unit before use.

3 Adjust light range, light angle, and radiant quantity to optimize images.

When using color image processing equipment, readjust the white balance of the camera according to the operating conditions.



To Obtain the Optimal Image

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.

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 light-guiding diffusion plate after you disassemble the Light Unit. Otherwise, printed dots on the surface may be damaged.

6 Control Units

When connecting a Control Unit to the Light Unit, use following CCS Control Units for the LED Lights. Select a Control Unit to match the application and purpose. When making the selection, confirm that the total power consumption of the connected Light Units will be within the Control Unit output power specifications. In addition, independent control is enabled by selecting a Control Unit with the number of channels corresponding to the number of input connectors for the Light Units that are used. Read the *Instruction Guide* of the Control Unit before use.

Digital Control Unit (Pulse Duty Control)

The Digital Control Unit is able to control radiant quantity with a PWM light control system.

Analog Control Unit (Constant Voltage Control)

The Analog Control Unit providing step-less intensity control through variable voltage control.

Overdrive Control Unit

The Overdrive Control Unit enables LED Lights to be used with strobes. By overdriving* the voltage, a current several times higher than normal current will flow. Therefore, it enables the Light Units to emit few times brighter than using the ON/OFF control function. (All Light Units that are described on this document are applicable for the operation with overdrive.)

* Overdrive: A state in which voltage raises instantly in excess of the rated voltage.

Please contact CCS about a new product and other Control Units.

7 Optional Accessories (Sold Separately)

The following products are available for the LFX3-series Light Units. Obtain the required product.

Optical Components PR-LFX3+LGP Series

The Optical Components include a pair of plates: a Protective Plate and a Light-guiding Diffusion Plate. These are the same Plates as those installed on the Light Unit in the factory. You can order them as replacements, e.g., if a Plate is broken. For detailed information, refer to *LFX3 Series Operation Guide for Optional Products*.

8 Main Specifications

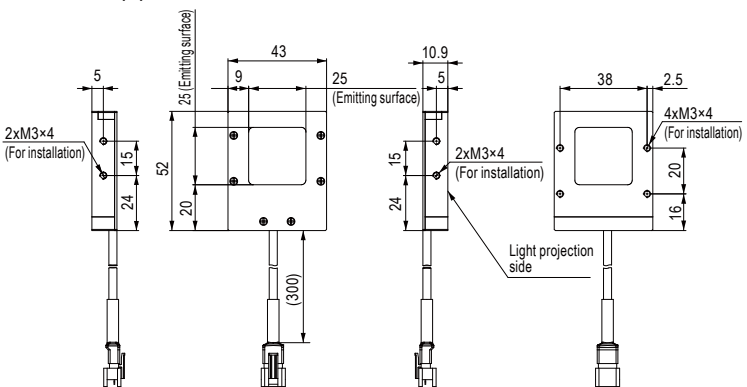
Common Specifications

Input voltage	24 VDC
Color temperature (typ.)	White: 6500 K
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 62471-1
Case material	Aluminum alloy, resin (protective plate, light-guiding diffusion plate)
Accessories	Instruction guide

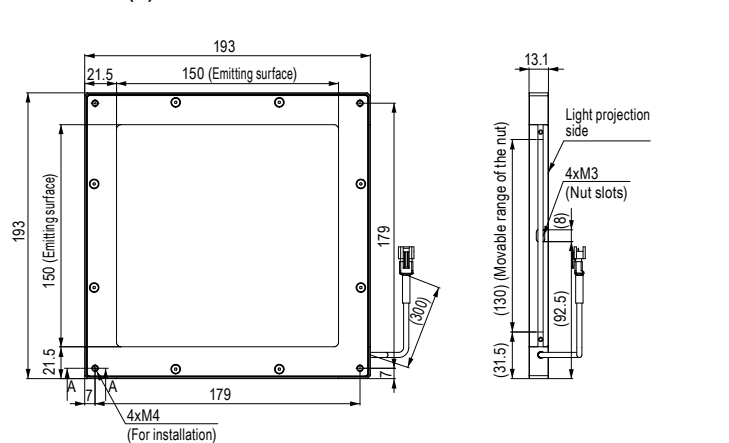
Specifications by Model

Model name	LED color	Power consumption (max.)	Weight (max.)	Model name of the optional accessory
LFX3-25SW(A)	White	1.5 W	80 g	PR-LFX3-25+LGP
LFX3-50SW(A)	White	12 W	230 g	PR-LFX3-50+LGP
LFX3-75SW(A)	White	18 W	320 g	PR-LFX3-75+LGP
LFX3-100SW(A)	White	23 W	400 g	PR-LFX3-100+LGP
LFX3-150SW(A)	White	35 W	620 g	PR-LFX3-150+LGP
LFX3-200X100SW(A)	White	35 W	620 g	PR-LFX3-200x100+LGP
LFX3-200SW(A)	White	46 W	910 g	PR-LFX3-200+LGP

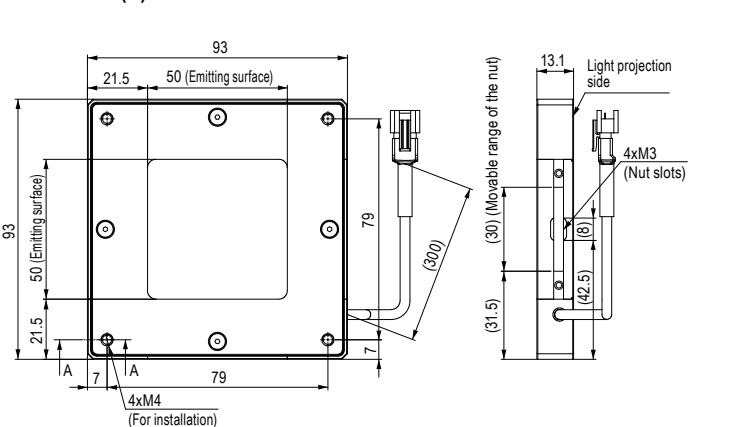
LFX3-25SW(A)



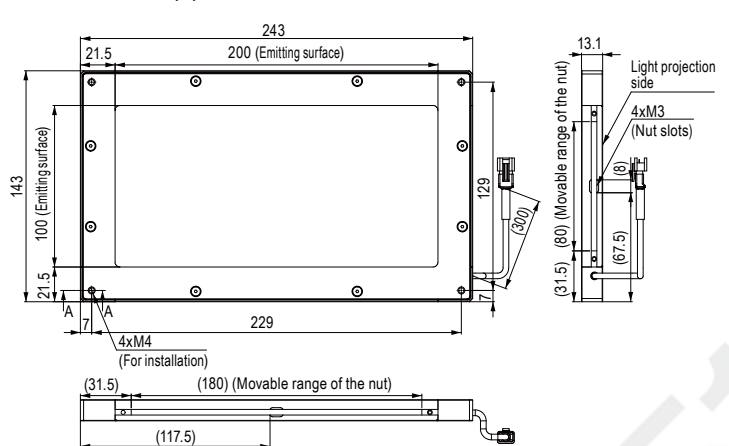
LFX3-150SW(A)



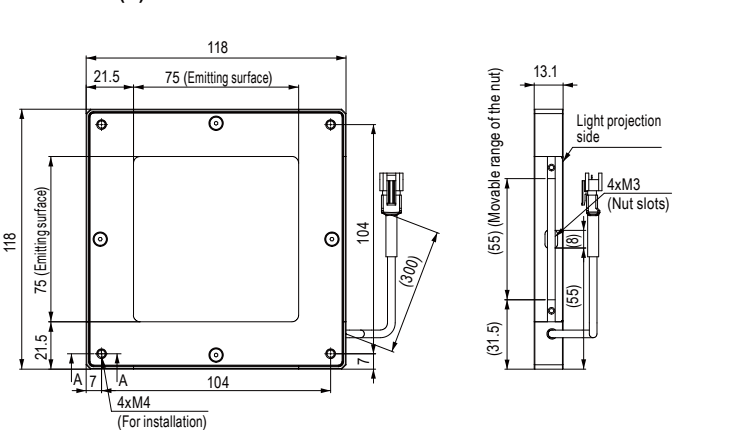
LFX3-50SW(A)



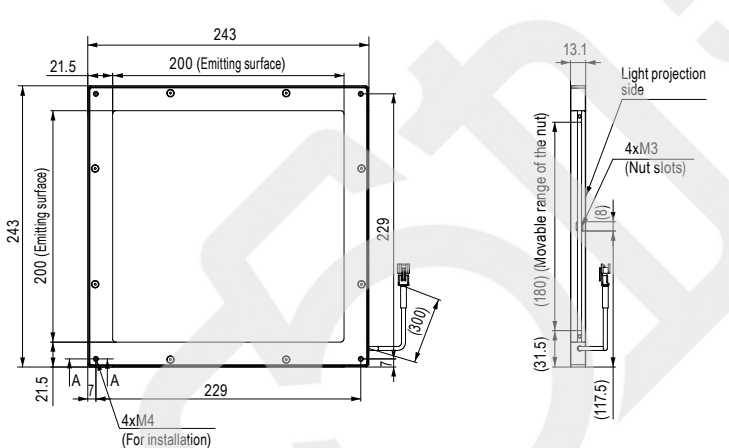
LFX3-200X100SW(A)



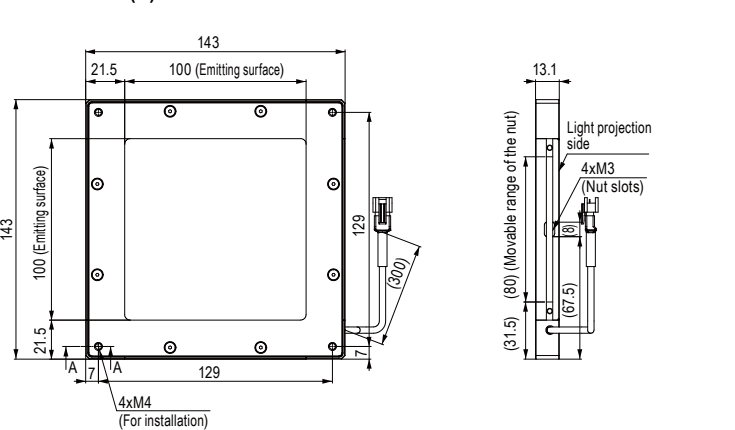
LFX3-75SW(A)



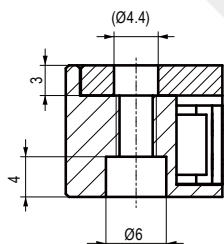
LFX3-200SW(A)



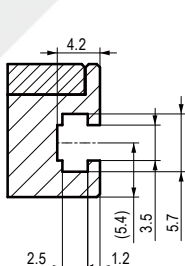
LFX3-100SW(A)



Detail Diagram for the A-A Surface **Detail Diagram for the M3 Nut Slot**



Detail Diagram for the M3 Nut Slot



Note: These detail diagrams are not applicable for the LFX3-25(A)-series Light Units.

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