

LFV-PF Series

Instruction Guide

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.

2 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 document 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 document 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.	To use the Light Unit, connect it to a High Power Strobe Control Unit from CCS. Using any power supply other than a High Power Strobe Control Unit may result in fire or Light Unit failure.
Make sure that the Light Unit is free of moisture or any liquid. Exposure to water may result in fire or electric shock.	Connect or disconnect the light cable only after turning off the High Power Strobe Control Unit. Failure to do so may result in circuit damage, fire caused by a minute spark, or 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.	If abnormal condition occurs such as fuming, heat, smell, noise, or so on, stop using the Light Unit immediately, turn the High Power Strobe Control Unit off, and unplug the power cord. 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 Light Unit failure. Use the High Power Strobe Extension Cable from CCS if it is necessary to extend the distance between the Light Unit and the Control Unit.	Do not drop the Light Unit or subject it to impact. Doing so may cause the Light Unit to malfunction.
Be careful of static electricity. Damage to the LED Light Unit may occur, if a person charged with static electricity touches it. Keep the Light Unit away from all items charged with static electricity.	Use the High Power Strobe Extension Cable (5 m or shorter). However, if the cable is too long, the light intensity will decrease due to voltage drop caused by the DC resistance of the cable.

Do not use the product in the following situations.

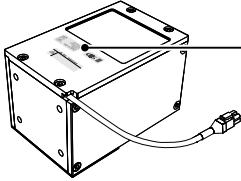
- Under conditions or in an environment not described in this instruction guide.
- In nuclear energy control systems, railroad systems, aviation systems, vehicles, combustion equipment, medical equipment, amusement machines, or safety equipment.
- In applications involving serious risk to life or property,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

Please install the product to locations with following conditions. Incorrect installation location may cause product 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 label is attached to the LED Light Unit. The name label specifies the model name, peak current, and serial number. Be sure to check the contents before using the Light Unit and handle the label with care. If the label is damaged and the contents cannot be checked, please contact CCS Inc.



Name label (Example)	
MODEL	LFV-PF-mnSW
Ser.No.	012345-012345
Power	48V/mA
CCS Inc.	MADE IN JAPAN

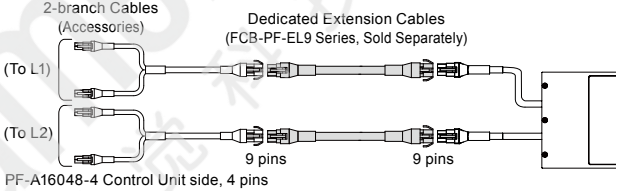
3 Operating Instructions

Make sure that the High Power Strobe Control Unit is turned OFF before you connect the Light Unit.

1 Connect the light cables to a High Power Strobe Control Unit.

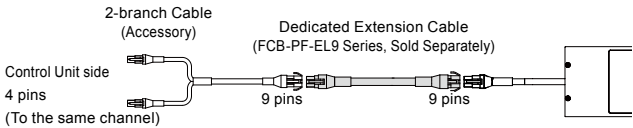
For the LFV-PF-100-series Light Units

- Connect the light cables to a High Power Strobe Control Unit, PF-A16048-4.
- Use two 2-branch cables that come with the Light Unit and connect the Light Unit and a High Power Strobe Control Unit. Connect both of the 4-pin connectors of the 2-branch cable to the output connectors that supply power on the same channel of a Control Unit. For example, connect one 2-branch cable to two L1 output connectors and the other to two L2 output connectors on a Control Unit.
- Insert the plug all the way into the connector.
- Dedicated Extension Cables are optionally available for the Light Units. For details, refer to 5. *Dedicated Extension Cables FCB-PF-EL9 Series (Sold Separately).*



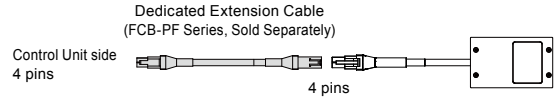
For the LFV-PF-70-series Light Units

- Connect the light cable to a High Power Strobe Control Unit. The High Power Strobe Control Unit must be equipped with **ELR-04NV** connectors for power output.
- Use a 2-branch cable that comes with the Light Unit and connect the Light Unit and a High Power Strobe Control Unit. Connect both of the 4-pin connectors of the 2-branch cable to the output connectors that supply power on the same channel of a Control Unit. For example, connect the 4-pin connectors to the L1-1 and L1-2 output connectors on a PF-A4048-2 Control Unit.
- Insert the plug all the way into the connector.
- Dedicated Extension Cables are optionally available for the Light Units. For details, refer to 5. *Dedicated Extension Cables FCB-PF-EL9 Series (Sold Separately).*



For the LFV-PF-35- or LFV-PF-50-series Light Units

- Connect the light cable to a High Power Strobe Control Unit. The High Power Strobe Control Unit must be equipped with **ELR-04NV** connectors for power output.
- Insert the plug all the way into the connector.
- High Power Strobe Extension Cables (FCB-PF Series, sold separately) are available for the Light Units. For details, refer to the instruction guide for the High Power Strobe Control Unit.

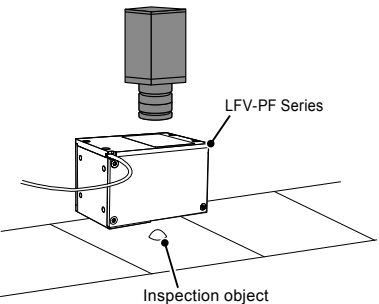


2 Turn ON the High Power Strobe Control Unit, and then make the Light Unit flash.

For the LFV-PF-100 Light Units

Set one of the TRG-LINK1 to 4 items on the COM menu of the PF-A16048-4 Control Unit. You can make the Light Unit circuits on two channels flash at the same time linked to a trigger signal that is input through one of the pins in the trigger input connector.

Example)
Setting of TRG-LINK1: 12--
When a trigger signal is input through pin 1 in the trigger input connector, the Light Unit circuits on the L1 and L2 channels will flash at the same time.



- Conceptual Diagram -

3 Adjust the Light Unit position and radiant quantity to optimize images.

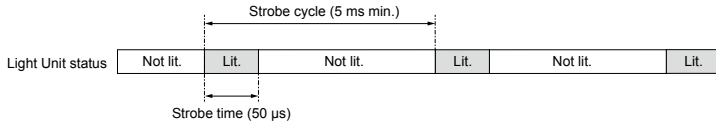
3 Operating Instructions (Continued)



Warning

Use the Light Unit within the lighting conditions (maximum strobe time and maximum duty cycle*). Exceeding the lighting conditions, such as performing continuous lighting using a power supply other than a High Power Strobe Control Unit, may result in fire or Light Unit failure. For the lighting conditions, refer to 6. *Main Specifications*.

* The duty cycle is the strobe operation ratio expressed by the following equation:
Duty cycle (%) = 100 X Strobe time / Strobe cycle
For example, if you want to restrict the duty cycle to 1% or less when the strobe time is 50 μs, you must make the Light Unit flash with a cycle of 5 ms or longer.



4 Optional Accessories (Sold Separately)

These products are available as required.

Optional accessories	For the LFV-PF-35-series Light Unit	For the LFV-PF-50-series Light Unit	For the LFV-PF-70-series Light Unit	For the LFV-PF-100-series Light Unit
Polarizing Plate	PL-LFV3-35	PL-LFV3-50	PL-LFV3-70	PL-LFV3-100
Light Control Film	LC-LFV3-35	LC-LFV3-50	LC-LFV3-70	LC-LFV3-100
Diffusion Plate (light-color)	DF-LFV3-35	DF-LFV3-50	DF-LFV3-70	DF-LFV3-100
Diffusion Plate (dark-color)	DF-LFV3-35-UF	DF-LFV3-50-UF	DF-LFV3-70-UF	DF-LFV3-100-UF

* This is the same Diffusion Plate as the one installed at the factory. You can order it as a replacement, e.g., if the original Diffusion Plate is broken.

For details, refer to *LFV3/LFV-PF Series Operation Guide for Optional Products*.

- Ghost images (double vision) of the inspection object may appear due to reflection from the half mirror inside the Light Unit. It is impossible to remove these images because of the characteristics of the Light Unit.
- An image of the emitting surface of the Light Unit may be reflected by the inspection object. In that case, install an optional Light Control Film into the Light Unit.
- Dust, dirt, or fingerprints on the glass portions of the Light Unit may affect the captured image. In that case, clean the Light Unit as follows:
 - Remove dust and dirt by blowing it off with air. Do not touch the Light Unit with your hand.
 - Use a soft, finely woven cloth to wipe away any marks, such as fingerprints.
 - Use a soft, finely woven cloth soaked with diluted neutral detergent to remove any heavy dirt.

Also, handle the Light Unit with care during daily use. Make sure no dust, dirt, or fingerprints adhere to the Light Unit.

6 Main Specifications

Common Specifications

Input voltage	48 VDC max.
Peak wavelength / correlated color temperature (typ.)	Red: 627 nm, White: 7,800 K
Lighting conditions	Maximum strobe time: 500 μs, Maximum duty cycle: 1%
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 EN62471
Case material	Aluminum alloy, Glass

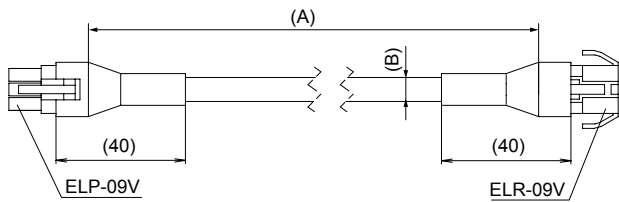
Specifications by Model

Model name	LED color	Peak current	Connector	Polarity	Weight (max.)	Accessories
LFV-PF-35RD	Red	10.8 A	ELP-04NV	1: (+), 2: (+), 3: (-), 4: (-)	230 g	Instruction guide
LFV-PF-35SW	White	14.4 A			400 g	
LFV-PF-50RD	Red	18 A				
LFV-PF-50SW	White	21.6 A				
LFV-PF-70RD	Red	37.8 A	ELP-09V	1: (+), 2: (+), 3: (-), 4: (-), 5: (+), 6: (+), 7: (-), 8: (-), 9: NC	800 g	Instruction guide, 2-branch cable (Model: FCB-0.3-PF-W-EL4-EL9)
LFV-PF-70SW	White	37.8 A			1,400 g	Instruction guide, 2-branch cable (Model: FCB-0.3-PF-W-EL4-EL9) x 2 pcs.
LFV-PF-100RD	Red	48.6 A (L1: 25.2 A L2: 23.4 A)	ELP-09V x 2 pcs.			
LFV-PF-100SW	White	64.8 A (L1: 32.4 A L2: 32.4 A)				

5 Dedicated Extension Cables FCB-PF-EL9 Series (Sold Separately)

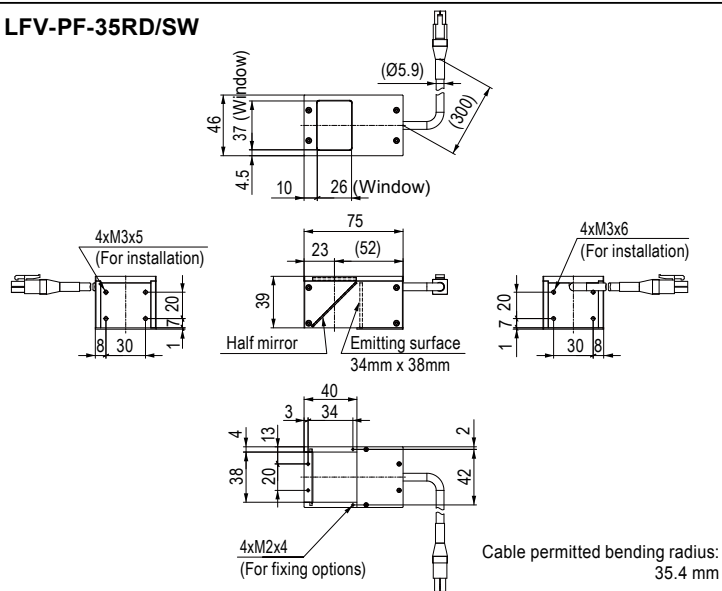
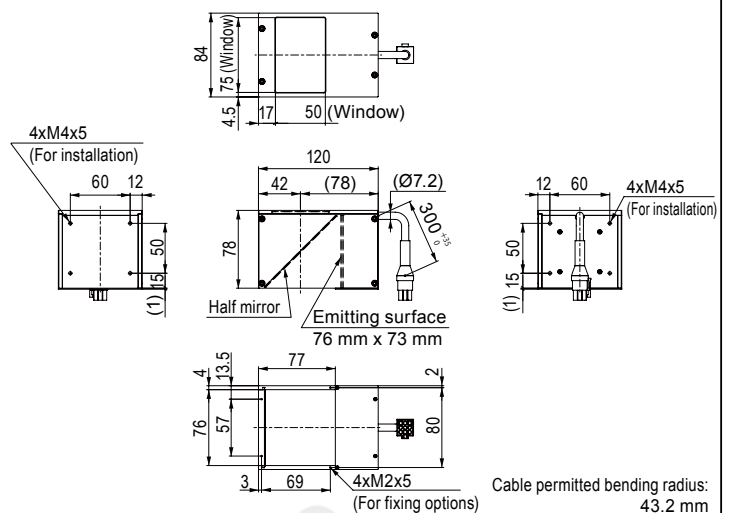
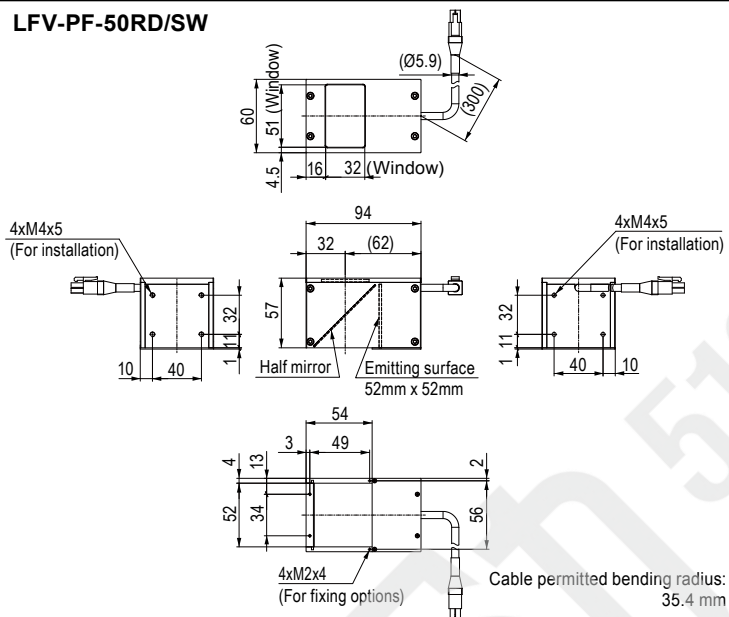
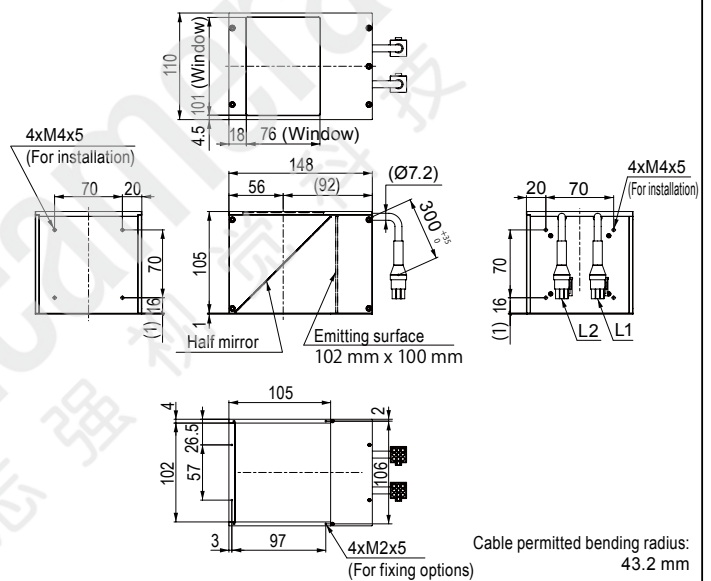
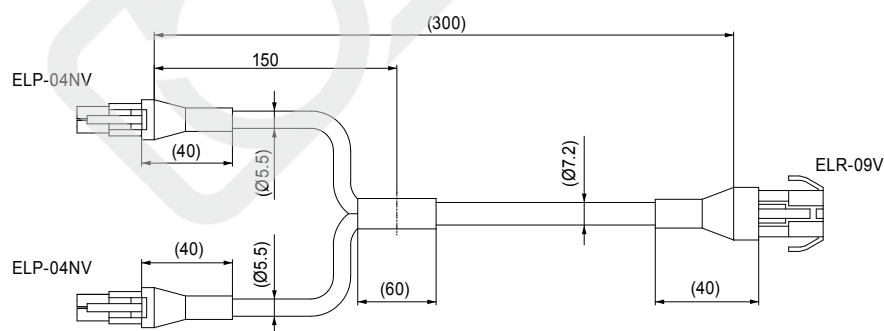
These extension cables are used for connecting the LFV-PF-70- or LFV-PF-100-series Light Unit and the High Power Strobe Control Unit.

FCB-1-PF-EL9 / 2-PF-EL9 / 3-PF-EL9 / 5-PF-EL9



(Unit: mm)

Model name	FCB-1-PF-EL9	FCB-2-PF-EL9	FCB-3-PF-EL9	FCB-5-PF-EL9
Dimension A	1,000	2,000	3,000	5,000
Dimension B	Ø7.4	Ø7.4	Ø7.4	Ø9.1
Weight	100 g max.	190 g max.	270 g max.	680 g max.
Permitted bending radius	44.4 mm	44.4 mm	44.4 mm	54.6 mm

LFV-PF-35RD/SW

LFV-PF-70RD/SW

LFV-PF-50RD/SW

LFV-PF-100RD/SW

2-Branch Cable (Accessory for the LFV-PF-70- and LFV-PF-100-Series Light Units)


Model name: FCB-0.3-PF-W-EL4-EL9
Cable permitted bending radius: 43.2 mm



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