

HPD-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.

	<b>Warning</b>	Indicates that incorrect usage may result in serious injury or death.		<b>Caution</b>	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.

<b>Warning</b>	
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 and cables 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.

<b>Caution</b>	
Do not use user-made cables. Doing so may cause Light Unit failure. Use the High Power Strobe Extension Cables 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 Cables (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 Light Unit in the following situations.

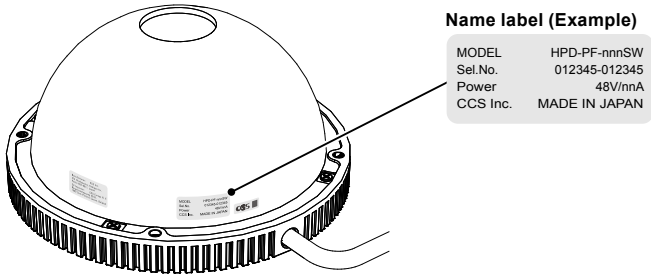
- Under conditions or in an environment not described in this instruction guide.
- In nuclear energy control systems, railroad systems, aviation systems, vehicles, combustion equipment, medical equipment, amusement machines, or safety equipment.
- In applications involving serious risk to life or property,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

Please install the 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.



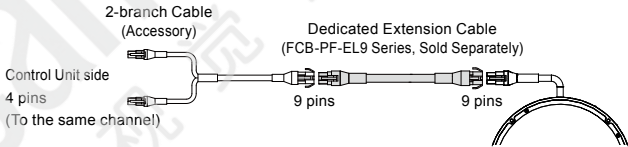
3 Operating Instructions

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

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

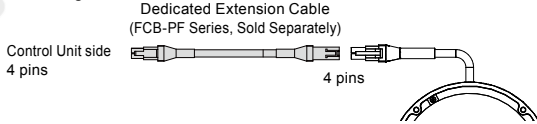
For the HPD-PF-150- or HPD-PF-200-series Light Units

- 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 HPD-PF-75- or HPD-PF-100-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.

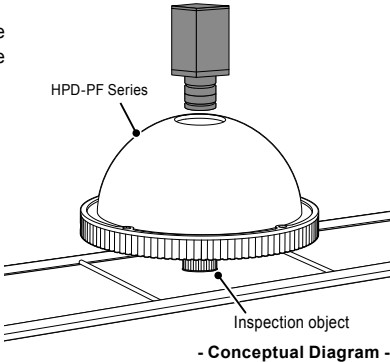


For information on High Power Strobe Control Unit and Extension Cables (FCB-PF Series), refer to the instruction guide for the High Power Strobe Control Unit.

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

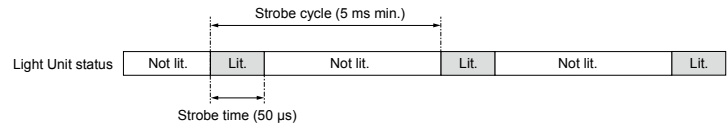
3 Adjust light range, light angle, and radiant quantity to optimize images.

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



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 Brackets (Sold Separately)

The following Brackets are available to mount the Light Units. Obtain the required Brackets.

### 1 Expansion Mounting Brackets

These Brackets are used to install an HPD-PF- or HPR-PF-series Light Unit with mounting holes at intervals that are larger than the mounting holes on the Light Units, and they are used to install these Light Units to a vertical installation surface.

### 2 Light Joint Brackets

These Brackets are used to join a Ring Light Unit with an HPD-PF-series Light Unit. You can use the Brackets to add low-angle illumination.

### 3 Coaxial Light Joint Brackets

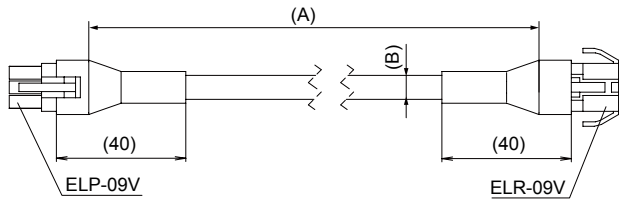
These Brackets are used to join a Coaxial Light Unit with an HPD-PF-series Light Unit. You can use the Brackets to achieve omnidirectional irradiation, which compensates for the absence of irradiation due to the camera-side opening of the HPD-PF-series Light Unit, for the workpiece.

The Brackets that can be used depend on the size of the Light Unit. For details, refer to the *HPD2/HPR2/HPD-PF/HPR-PF-series Optional Bracket Operation Guide*.

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

These extension cables are used for connecting the HPD-PF-150- or HPD-PF-200-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	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

## 6 Main Specifications

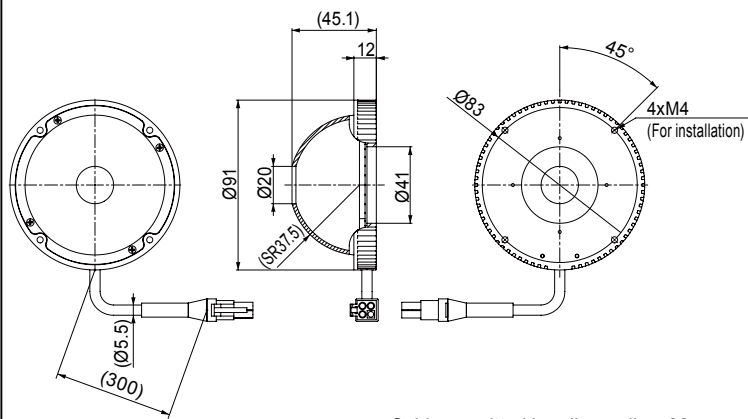
### I Common Specifications

Input voltage	48 VDC max.
Lighting conditions	Maximum strobe time: 500 $\mu$ s, 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 EN62471-1
Case material	Aluminum alloy, Resin

### I Specifications by Model

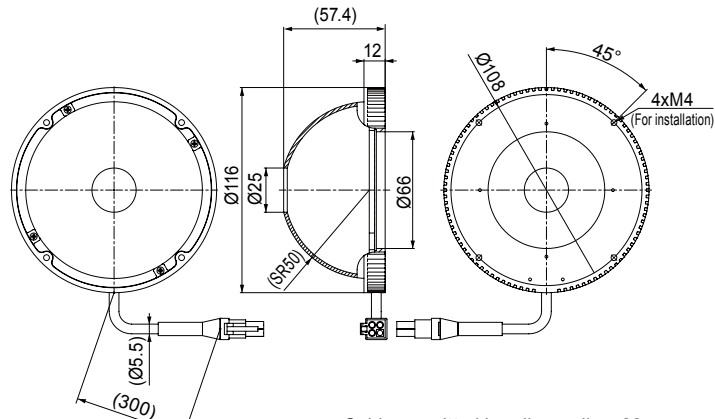
Model	LED color	Peak wavelength/ Correlated color temperature (typ.)	Peak current	Connector	Polarity	Weight (max.)	Accessories
HPD-PF-75RD	Red	636 nm	12 A	ELP-04NV	1: (+), 2: (+), 3: (-), 4: (-)	150 g	Instruction guide
HPD-PF-75SW	White	6,500 K				21.6 A	
HPD-PF-100RD	Red	636 nm					
HPD-PF-100SW	White	6,500 K					
HPD-PF-150RD	Red	636 nm	36 A	ELP-09V	1: (+), 2: (+), 3: (-), 4: (-), 5: (+), 6: (+), 7: (-), 8: (-) 9: NC	310 g	Instruction guide, 2-branch cable (Model: FCB-0.3-PF-W-EL4-EL9)
HPD-PF-150SW	White	6,500 K				43.2 A	
HPD-PF-200RD	Red	636 nm					
HPD-PF-200SW	White	6,500 K					

### HPD-PF-75RD/SW



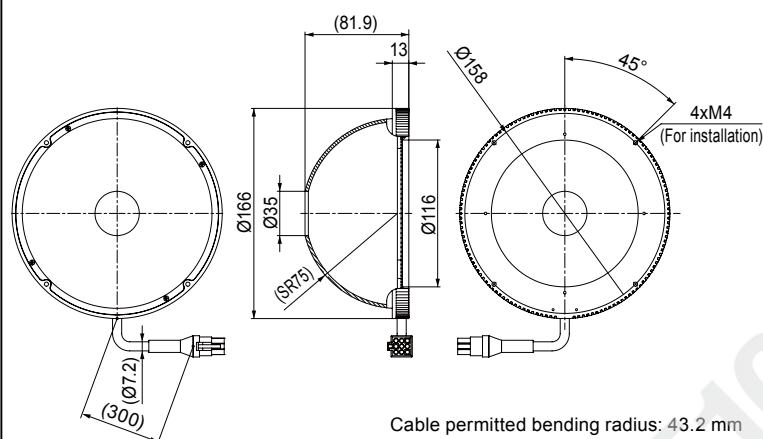
Cable permitted bending radius: 22 mm

### HPD-PF-100RD/SW



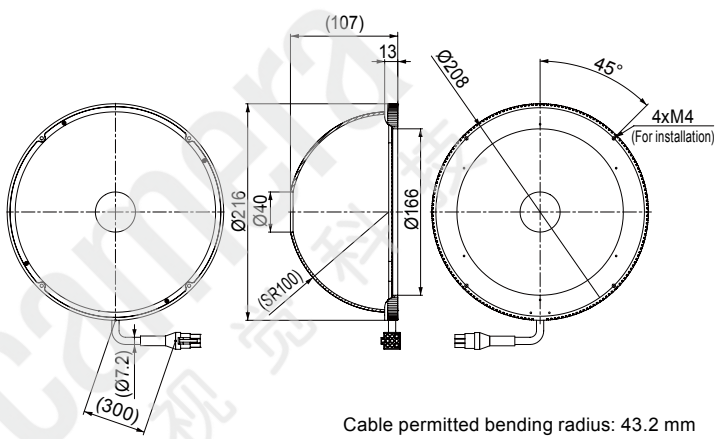
Cable permitted bending radius: 22 mm

### HPD-PF-150RD/SW



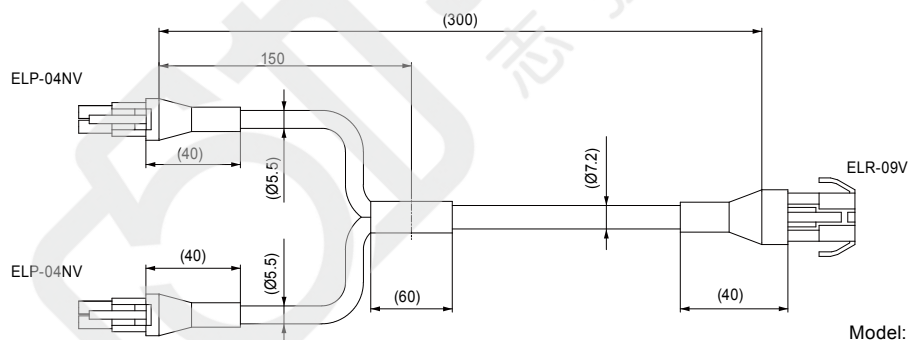
Cable permitted bending radius: 43.2 mm

### HPD-PF-200RD/SW



Cable permitted bending radius: 43.2 mm

### 2-branch Cable (Accessory for the HPD-PF-150- and HPD-PF-200-series Light Units)



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



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