

**“Extreme Power”  
Strobe Lights**

Strobe time:  
**1 to 100  $\mu$ s**  
991 levels (steps of 0.1  $\mu$ s)

Peak illuminance:  
**15.5 million lx**

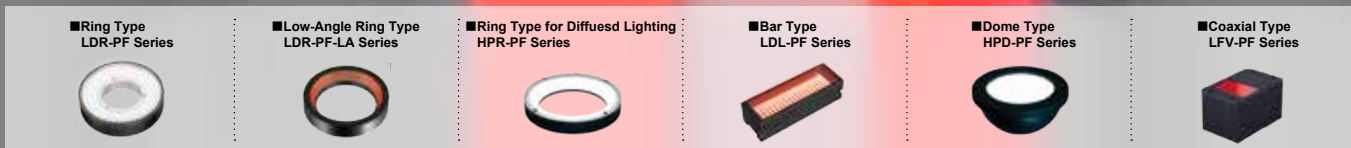
\* Measured using LDL-PF-33X8SW (LWD=10 mm)

# High Power Strobe Lights

## PF Series

**NEW  
LINE  
UP**

More ways **to solve high-speed inspections** with the expanded PF Series lineup



**Ultra-powerful lighting reduces exposure time. No blurred images even on high-speed lines!**

**Horizontal Blur**

**Conventional product**  
Long exposure period and insufficient brightness result in image blur.

The image is blurred in fast moving production lines.

**PF Series**  
High brightness allows for short exposure time and reduces blur.

Applicable to fast moving production lines.

**Vertical Blur**

**Conventional product**  
Adjusting aperture to compensate for dim lighting reduces depth of field.

Vibration causes image blur.

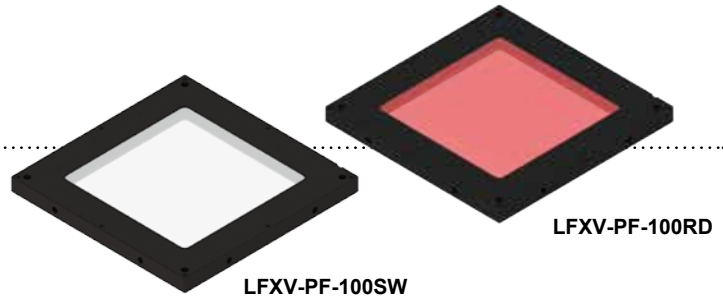
**PF Series**  
High brightness allows for smaller aperture and increased depth of field.

Image unaffected by vibration.

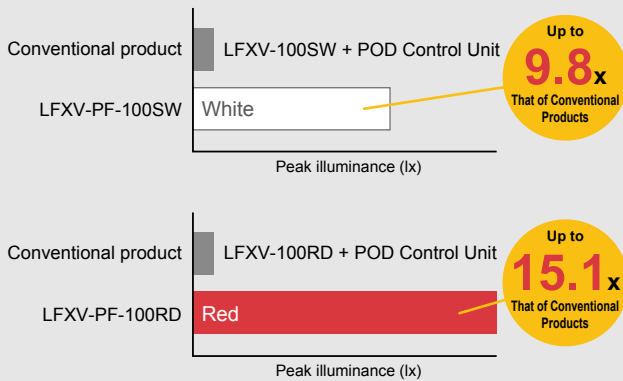
**Flat Dome Type**

**LFXV-PF Series**

Dome light effect in a flat design  
Ultra-high power strobe with uniform diffuse illumination



**Brightness comparison versus conventional products**



\* Comparison of peak illuminance at LWD 10 mm

**Imaging example: print inspection on food cans** Food / Cans

■ Workpiece

Food Cans

■ LFXV-PF-100SW + PF Control Unit

Print is clear and readable.

■ Example configuration

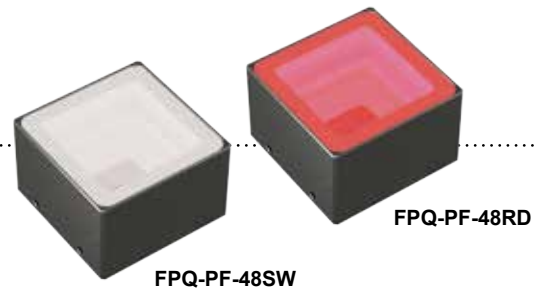
\* Imaging at LWD 10 mm

Light emission time 30 μs

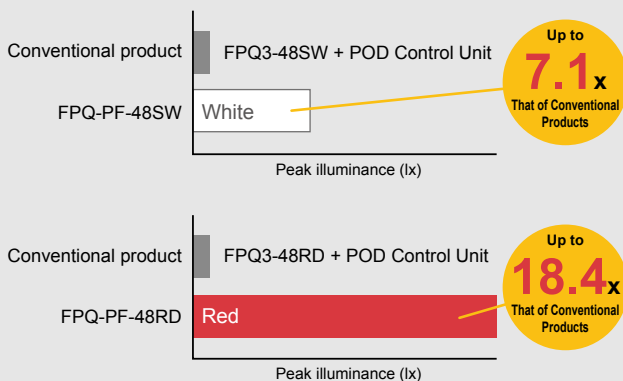
**Low-Angle Square Type**

**FPQ-PF Series**

Low-angle diffuse illumination from 4 directions  
Capable of detecting contours of rectangular workpieces and imaging with minimal glare



**Brightness comparison versus conventional products**



\* Comparison of peak illuminance at LWD 10 mm

**Imaging example: exterior imaging of electronic components** Semiconductor

■ Workpiece

Electronic Components

■ FPQ-PF-48SW + PF Control Unit

Clearly image print and cracked areas on electronic components.

■ Example configuration

\* Imaging at LWD 8 mm

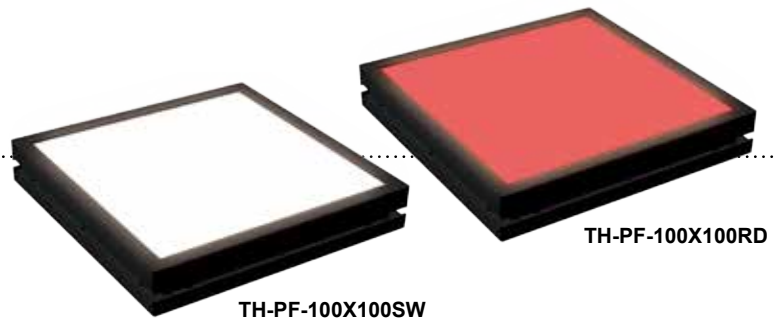
Light emission time 100 μs

## Flat Type

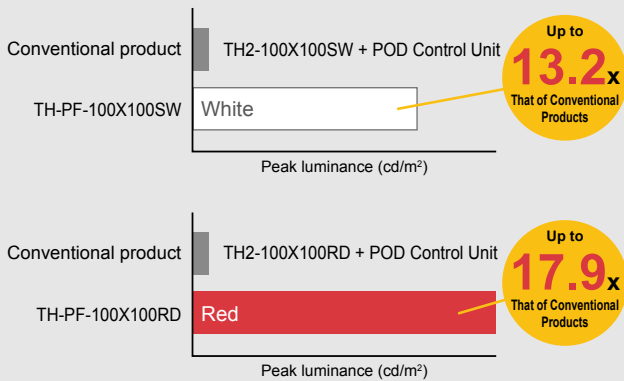
# TH-PF Series

Uniform diffuse light for backlight illumination

Increase the speed of liquid level and shape/appearance inspections



### ▶ Brightness comparison versus conventional products



\* Comparison of peak luminance

### ▶ Imaging example: liquid level testing for disinfectant solution Pharmaceuticals

■ Workpiece

Disinfectant Solution

■ TH-PF-100X100SW + PF Control Unit

← Liquid level  
← Label surface

■ Example configuration

Camera, Workpiece, Diffusion plate, LEDs

Accurately detect liquid level and label position.

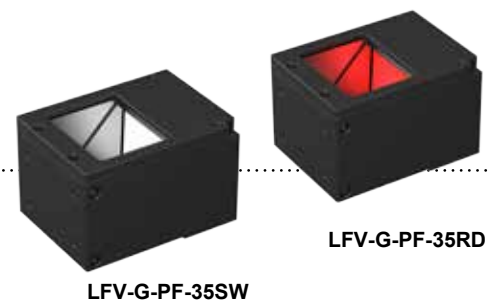
\* Imaging at LWD 55 mm

Light emission time 100 μs

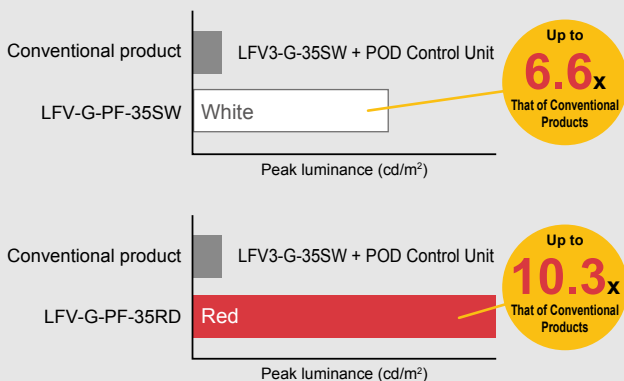
## Coaxial Type (High-Resolution)

# LFV-G-PF Series

Thin half-mirror prevents ghost images  
For high-speed imaging with high-resolution cameras



### ▶ Brightness comparison versus conventional products



\* Comparison of peak luminance

### ▶ Imaging example: exterior inspection of drain gasket Automotive

■ Workpiece

Drain Gasket

■ LFV-G-PF-35SW + PF Control Unit

Clearly image gasket chipping.

■ Example configuration

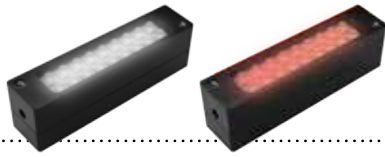
Camera, Half mirror, LEDs, Heat dissipation material, Workpiece

\* Imaging at LWD 30 mm

Light emission time 100 μs

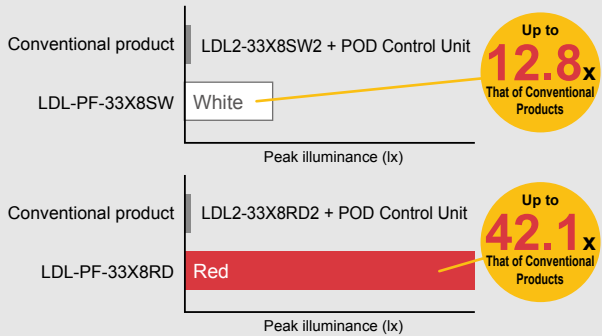
## Small sizes added to bar / diffused ring types

### Bar Type **LDL-PF Series**



LDL-PF-33X8SW    LDL-PF-33X8RD

#### ▷ Brightness comparison versus conventional products



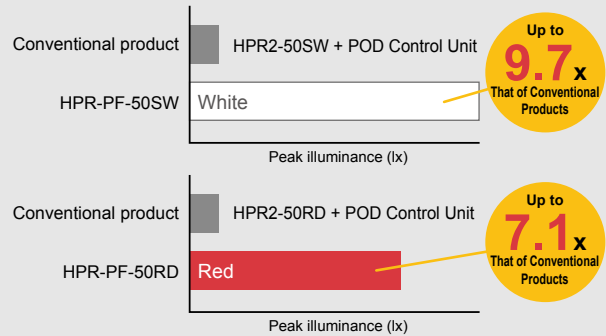
\* Imaging at LWD 10 mm

### Diffused Ring Type **HPR-PF Series**



HPR-PF-50SW    HPR-PF-50RD

#### ▷ Brightness comparison versus conventional products



\* Imaging at LWD 10 mm

## Imaging comparison versus conventional products

Short light emission time allows for clear image acquisition.

Reduce exposure time and **speed up inspection lines.**

■ Workpiece



Can

■ LFXV-100SW + POD Control Unit



Light emission time: 300 μs

■ LFXV-PF-100SW + PF Control Unit



Light emission time: 30 μs

\* Imaging at LWD 10 mm

## Shorten emission time to approx. 1/10


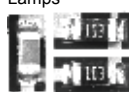
of conventional products on overdrive.

### High Brightness

### Comparable to

### Xenon Flash Lamps

Adjusting the strobe time of the PF Series light unit enabled the same inspection speed made possible by xenon lamps.

	Brightness stability	Flashing failure	Controllability	Operational lifetime	Fiber cabling	Environmental impact	Operating noise	Number of channels
<b>High Power Strobe LED Lights</b>  Strobe time: 15 μs	<b>Stable</b> No impact on inspection accuracy.	<b>Flashing does not fail.</b> No impact on inspection accuracy.	<b>Good</b> Light intensity, strobe time, and lighting delay time can be set with various types of external control.	<b>Long</b> Long service life. 50,000 hours. (Expected service life)	<b>Flexible</b> Installation flexibility.	<b>Small</b> Contributes to reducing CO <sub>2</sub> and saving energy.	<b>Quiet</b> No operating noise.	<b>More than one</b> Available with multiple channels. Multiple light units can be used with a single control unit.
<b>Xenon Flash Lamps</b>  Strobe time: 1.75 μs (measured value)	<b>Fluctuant</b> Impacts inspection accuracy.	<b>Flashing sometimes fails.</b> Impacts inspection accuracy.	<b>Poor</b> Light control is possible, but strobe time is fixed.	<b>Short</b> The service life of xenon lamps is typically 3,000 hours.	<b>Inflexible</b> Inconvenient to route fiber.	<b>Large</b> Mercury contained in the used lamps makes them difficult to dispose.	<b>Abrasive</b> Characteristic operating noise.	<b>One</b> If multiple lights are required, additional fiber and light sources are required.

# Lineup

▷ Total of 10 series with 76 models to suit various imaging environments

Type	Model Name *1	Peak Current		Peak Wavelength / Correlated Color Temperature		Options	Extension Cables	Dedicated Control Units	Weight
		RD (Red)	SW(White)	RD (Red)	SW (White)				
Ring	LDR-PF-36□□	5.4 A		627 nm	7600 K	Diffusion plate Polarizing plate Mounting adapter	FCB-PF	PF-A4048-2 PF-A16048-4	70 g
	LDR-PF-54□□	10.8 A							110 g
	LDR-PF-75□□	18 A	21.6 A						150 g
Low-Angle Ring	LDR-PF-75□□-LA	14.4 A		622 nm	8000 K	Diffusion plate Mounting adapter	FCB-PF FCB-PF-EL9	PF-A4048-2 PF-A16048-4	125 g
	LDR-PF-100□□-LA	28.8 A							200 g
	LDR-PF-150□□-LA	42 A							350 g
Diffused Ring	HPR-PF-50□□ NEW	6 A		636 nm	6500 K	Brackets	FCB-PF FCB-PF-EL9	PF-A4048-2 PF-A16048-4	50 g
	HPR-PF-75□□	12 A							170 g
	HPR-PF-100□□	21.6 A							180 g
	HPR-PF-150□□	36 A							270 g
	HPR-PF-200□□	43.2 A							400 g
Low-Angle Square	FPQ-PF-32□□ NEW (Custom)	*2		*2		Reflective plate	*2	PF-A4048-2 PF-A16048-4	*2
	FPQ-PF-48□□ NEW	14 A		631 nm	6000 K	-	FCB-PF		90 g
Bar	LDL-PF-19X4□□ NEW (Custom)	*2		*2		Diffusion plate Polarizing plate Brackets	FCB-PF FCB-PF x 2 *3	PF-A4048-2 PF-A16048-4	*2
	LDL-PF-33X8□□ NEW	4 A		627 nm	7500 K				22 g
	LDL-PF-52X18□□	5.4 A							140 g
	LDL-PF-102X18□□	10.8 A							210 g
	LDL-PF-152X18□□	16.2 A							290 g
	LDL-PF-52X30□□	9 A							180 g
	LDL-PF-102X30□□	18 A							270 g
LDL-PF-152X30□□	27 A		380 g						
Flat	TH-PF-27X27□□ NEW (Custom)	*2		*2		Light control film Brackets	FCB-PF-EL9	PF-A4048-2 PF-A16048-4	*2
	TH-PF-51X51□□ NEW (Custom)	*2		625 nm	5200 K				200 g
	TH-PF-100X100□□ NEW	41 A							150 g
Dome	HPD-PF-75□□	12 A				636 nm	6500 K	Brackets	FCB-PF FCB-PF-EL9
	HPD-PF-100□□	21.6 A		310 g					
	HPD-PF-150□□	36 A		480 g					
	HPD-PF-200□□	43.2 A							
Flat Dome	LFXV-PF-25□□ NEW (Custom)	*2		*2		-	FCB-PF-EL9	PF-A4048-2 PF-A16048-4	*2
	LFXV-PF-50□□ NEW (Custom)	*2		631 nm	5600 K				440 g
	LFXV-PF-75□□ NEW (Custom)	*2							
	LFXV-PF-100□□ NEW	26 A	36 A						
Coaxial	LFV-PF-35□□	10.8 A	14.4 A			627 nm	7800 K	Diffusion plate Polarizing plate Light control film Brackets	FCB-PF FCB-PF-EL9
	LFV-PF-50□□	18.0 A	21.6 A	400 g					
	LFV-PF-70□□	37.8 A		800 g					
	LFV-PF-100□□	48.6 A	64.8 A	1400 g					
Coaxial (High-Resolution)	LFV-G-PF-27□□ NEW (Custom)	*2		*2		Protective Plate	FCB-PF	PF-A4048-2 PF-A16048-4	*2
	LFV-G-PF-35□□ NEW	8 A		623 nm	4800 K				150 g

\*1 □□ in the model name contains the LED color. (RD: Red, SW: White)

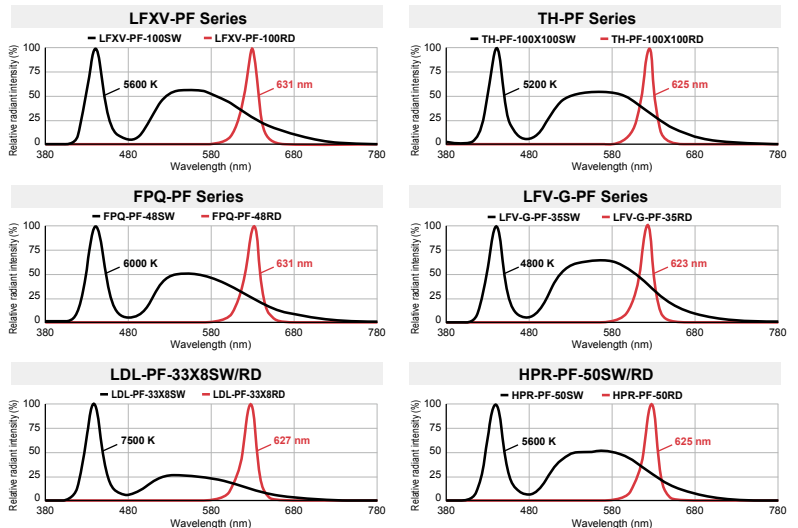
\*2 Contact our local sales office for details.

\*3 Light unit has two connectors. Use two extension cables of the same length to connect the light unit. Using cables of different lengths may cause uneven light emission due to voltage drop caused by the DC resistance of the cable.

## Common Specifications

Input voltage	DC48V
Lighting conditions	Maximum light emission time: 500 μs Maximum duty ratio: 1%
Connector	EL Connector (ELP-04NV/ELP-09V)
Extension cables	FCB-PF/FCB-PF-EL9 Series (Sold separately)
Cooling method	Natural air-cooling
Operating environment (indoors only)	Temperature: 0 to 40°C, Humidity: 20 to 85% RH (with no condensation)
Storage environment (indoors only)	Temperature: -20 to 60°C, Humidity: 20 to 85% RH (with no condensation)
CE marking	Safety standard: Conforms to EN62471-1
Environmental regulations	RoHS compliant

## LED Properties



Refer to our website for product details.

<https://www.ccs-grp.com/powerflash/>



The data included is for reference only. Actual values may vary.

For LED characteristics of models other than those listed above, please refer to the website or the general catalog.

# Data: Illuminance Graph and Uniformity (Representative Example)

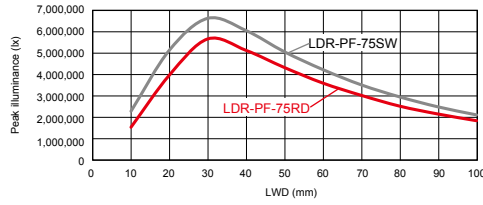
## Ring Type

### LDR-PF Series

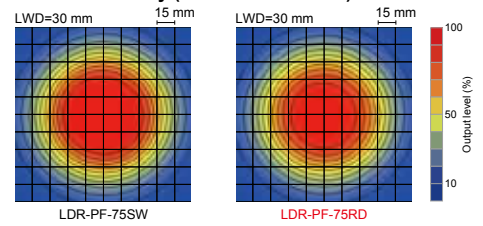


LDR-PF-75SW/RD

Illuminance graph<sup>\*1</sup> (LWD characteristics)<sup>\*2</sup>



Uniformity (Relative irradiance)



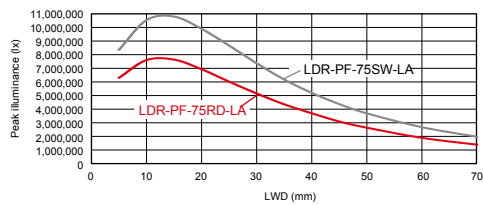
## Low-Angle Ring Type

### LDR-PF-LA Series

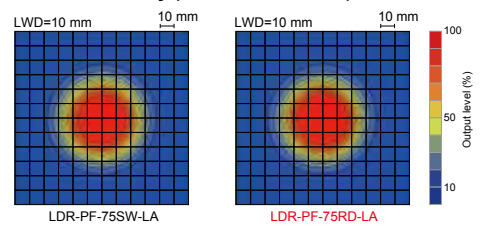


LDR-PF-75SW/RD-LA

Illuminance graph<sup>\*1</sup> (LWD characteristics)<sup>\*2</sup>



Uniformity (Relative irradiance)



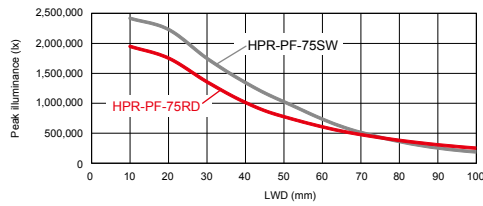
## Diffused Ring Type

### HPR-PF Series

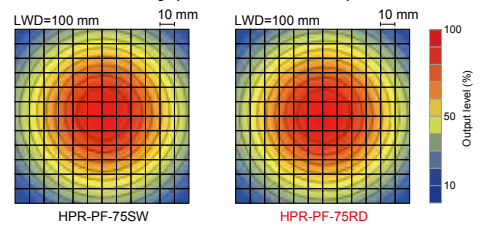


HPR-PF-75SW/RD

Illuminance graph<sup>\*1</sup> (LWD characteristics)<sup>\*2</sup>



Uniformity (Relative irradiance)

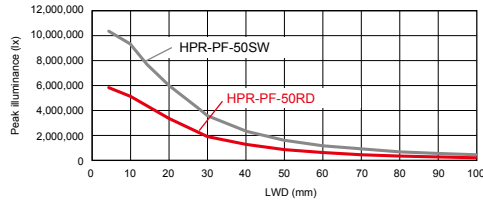


NEW

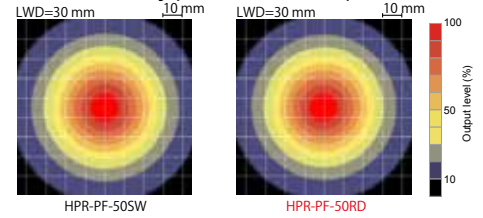


HPR-PF-50SW/RD

Illuminance graph<sup>\*1</sup> (LWD characteristics)<sup>\*2</sup>



Uniformity (Relative irradiance)



## Low-Angle Square Type

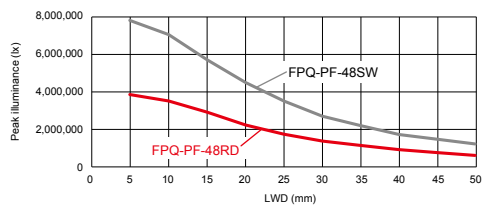
### FPQ-PF Series

NEW

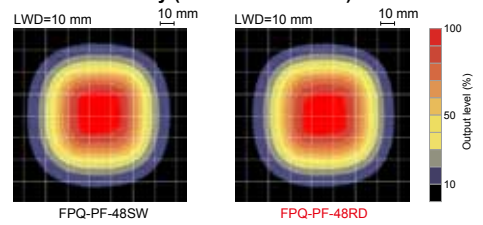


FPQ-PF-48SW/RD

Illuminance graph<sup>\*1</sup> (LWD characteristics)<sup>\*2</sup>



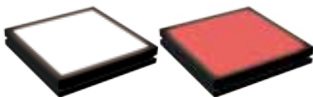
Uniformity (Relative irradiance)



## Flat Type

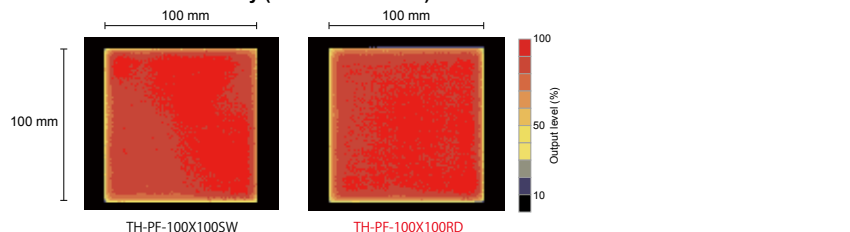
### TH-PF Series

NEW



TH-PF-100X100SW/RD

Uniformity (Relative irradiance)

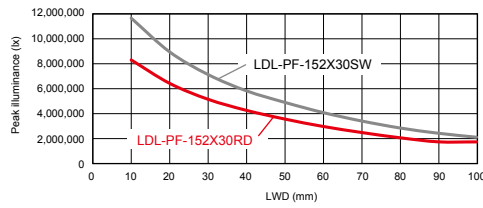


▷ Bar Type  
LDL-PF Series

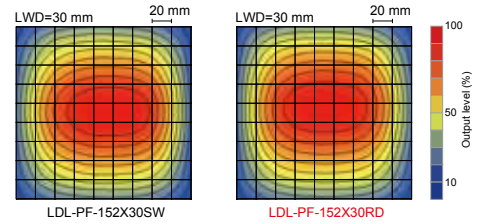


LDL-PF-152X30SW/RD

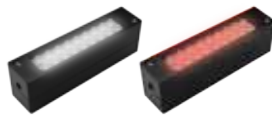
Illuminance graph <sup>\*1</sup> (LWD characteristics) <sup>\*2</sup>



Uniformity (Relative irradiance)

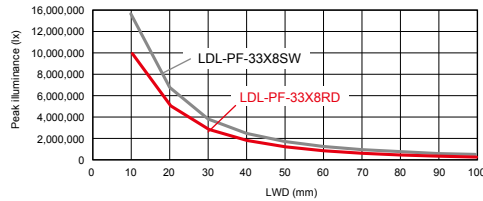


NEW

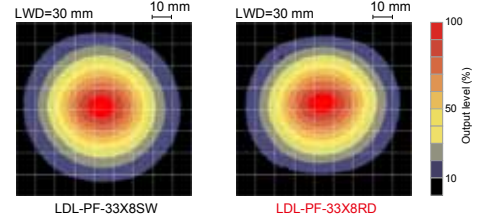


LDL-PF-33X8SW/RD

Illuminance graph <sup>\*1</sup> (LWD characteristics) <sup>\*2</sup>



Uniformity (Relative irradiance)

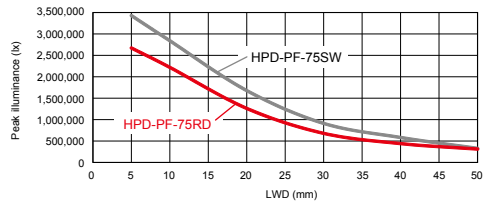


▷ Dome Type  
HPD-PF Series

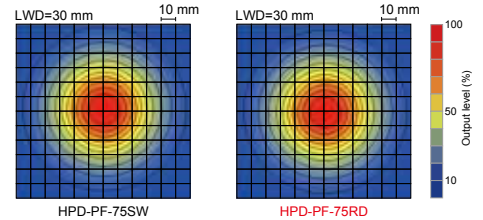


HPD-PF-75SW/RD

Illuminance graph <sup>\*1</sup> (LWD characteristics) <sup>\*2</sup>



Uniformity (Relative irradiance)



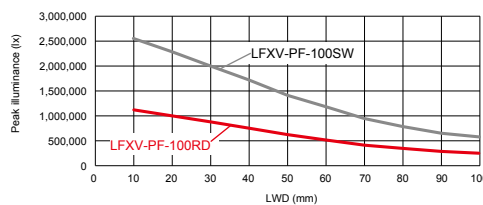
▷ Flat Dome Type  
LFXV-PF Series



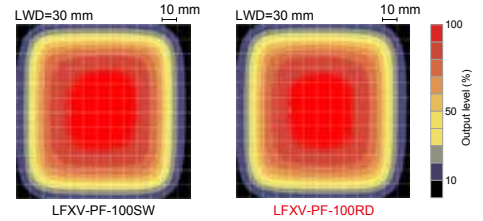
LFXV-PF-100SW/RD

NEW

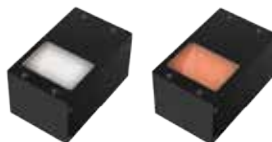
Illuminance graph <sup>\*1</sup> (LWD characteristics) <sup>\*2</sup>



Uniformity (Relative irradiance)

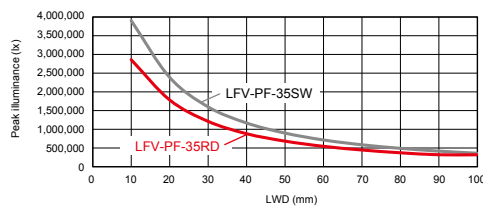


▷ Coaxial Type  
LFV-PF Series

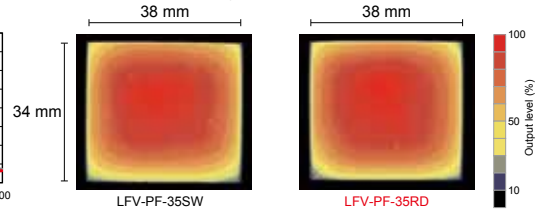


LFV-PF-35SW/RD

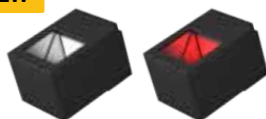
Illuminance graph <sup>\*1</sup> (LWD characteristics) <sup>\*2</sup>



Uniformity (Relative irradiance)



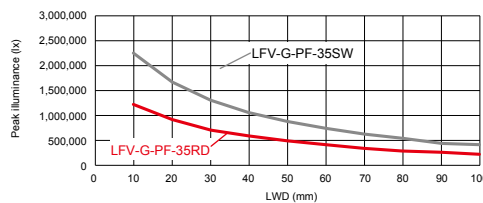
▷ Coaxial Type  
(High-Resolution)  
LFV-G-PF Series



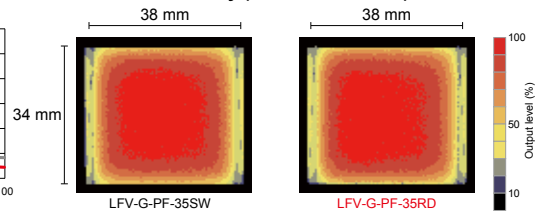
LFV-G-PF-35SW/RD

NEW

Illuminance graph <sup>\*1</sup> (LWD characteristics) <sup>\*2</sup>



Uniformity (Relative irradiance)

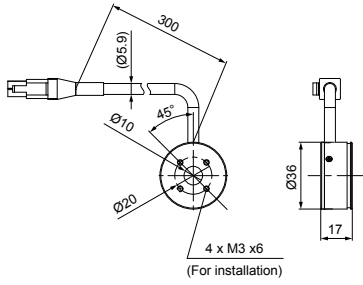


## Dimensions (mm)

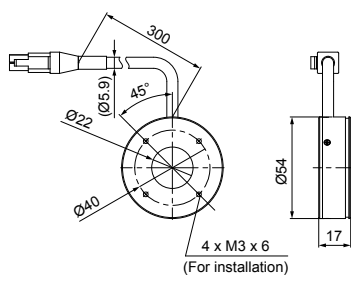
### ▷ Ring Type LDR-PF Series



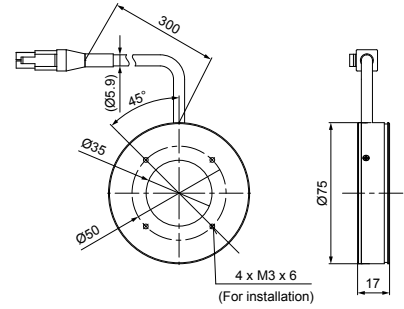
LDR-PF-36SW/RD



LDR-PF-54SW/RD



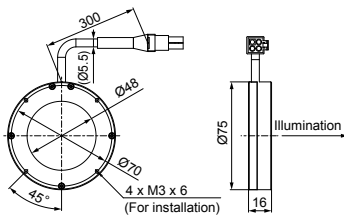
LDR-PF-75SW/RD



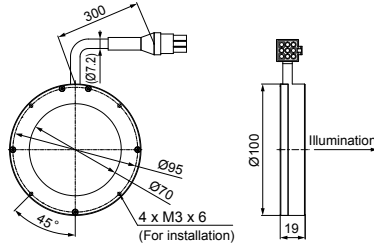
### ▷ Low-Angle Ring Type LDR-PF-LA Series



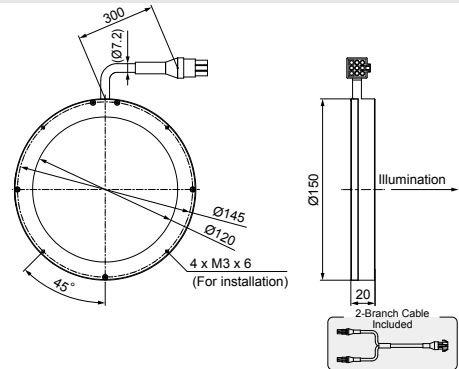
LDR-PF-75RD-LA / SW-LA



LDR-PF-100RD-LA / SW-LA



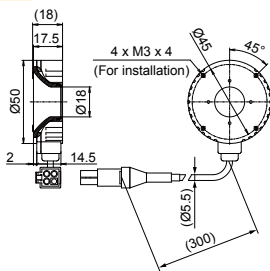
LDR-PF-150RD-LA / SW-LA



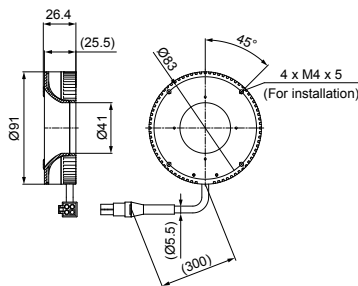
### ▷ Diffused Ring Type HPR-PF Series



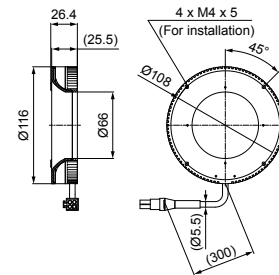
**NEW** HPR-PF-50SW/RD



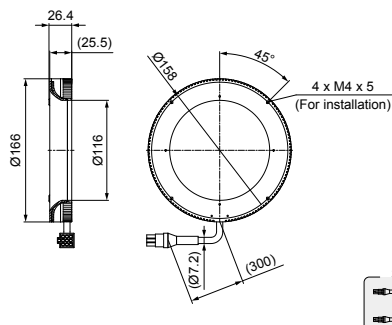
HPR-PF-75SW/RD



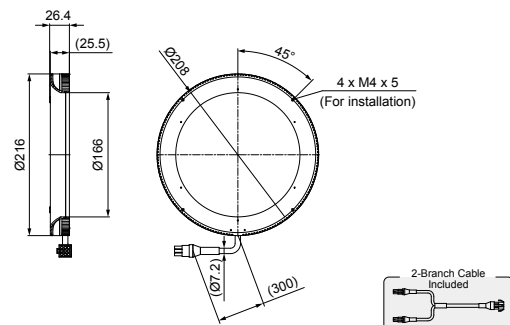
HPR-PF-100SW/RD



HPR-PF-150SW/RD



HPR-PF-200SW/RD



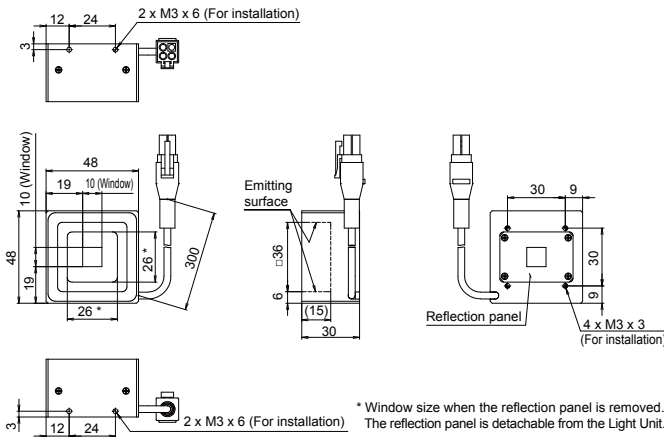


### ▷ Low-Angle Square Type FPQ-PF Series

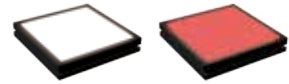


NEW

FPQ-PF-48SW/RD

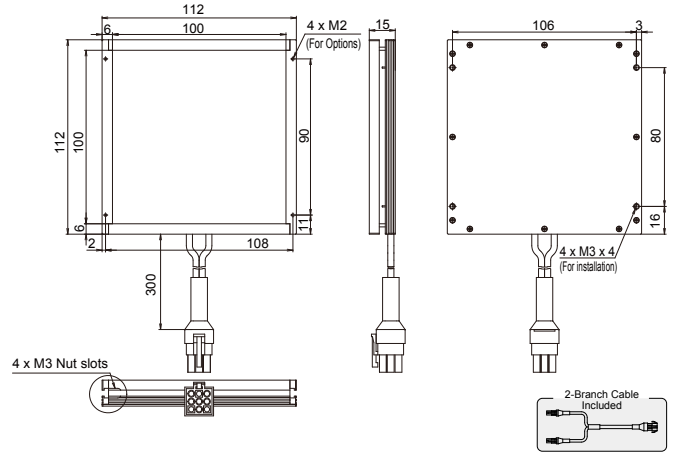


### ▷ Flat Type TH-PF Series

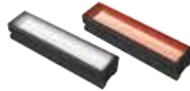


NEW

TH-PF-100X100SW/RD

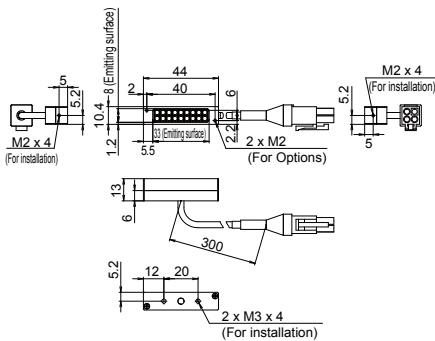


### ▷ Bar Type LDL-PF Series



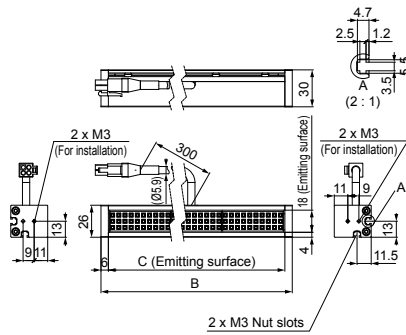
NEW

Emitting width 8 mm



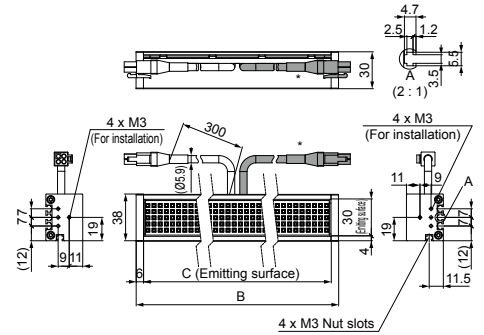
Model Name
LDL-PF-33X8SW/RD

Emitting width 18 mm



Model Name	B	C
LDL-PF-52X18SW / RD	64	52
LDL-PF-102X18SW / RD	114	102
LDL-PF-152X18SW / RD	164	152

Emitting width 30 mm



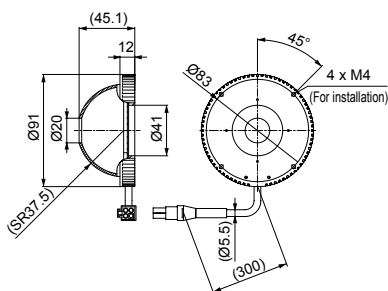
\* The LDL-PF-152X30SW/RD Light Unit has two connectors.

Model Name	B	C
LDL-PF-52X30SW / RD	64	52
LDL-PF-102X30SW / RD	114	102
LDL-PF-152X30SW / RD	164	152

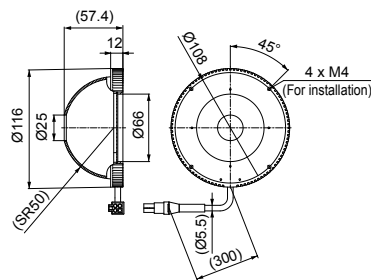
### ▷ Dome Type HPD-PF Series



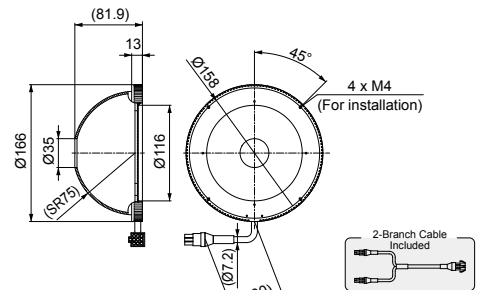
HPD-PF-75SW/RD



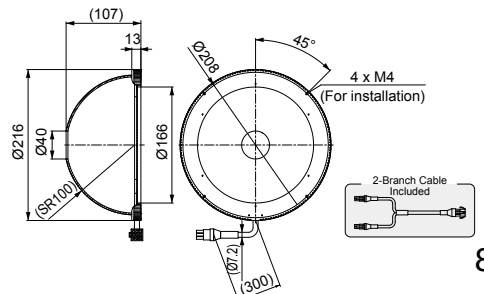
HPD-PF-100SW/RD



HPD-PF-150SW/RD

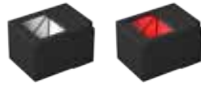


HPD-PF-200SW/RD



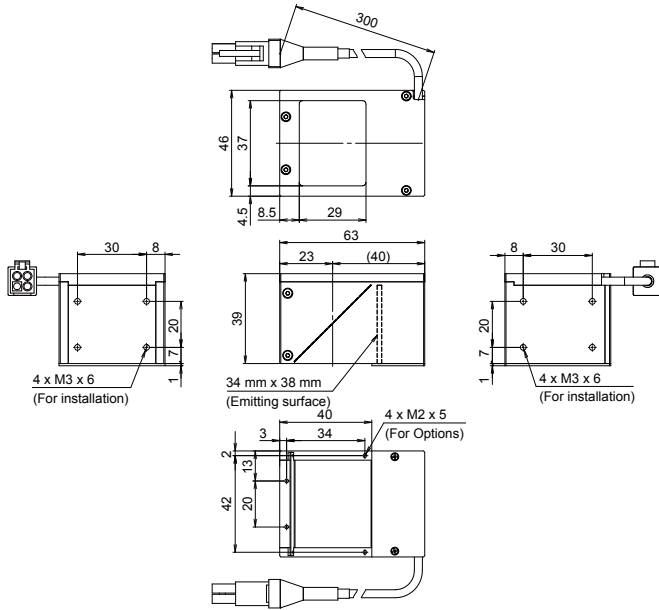
# Dimensions (mm)

## ▷ Coaxial Type (High-Resolution) LFV-G-PF Series



NEW

LFV-G-PF-35SW/RD

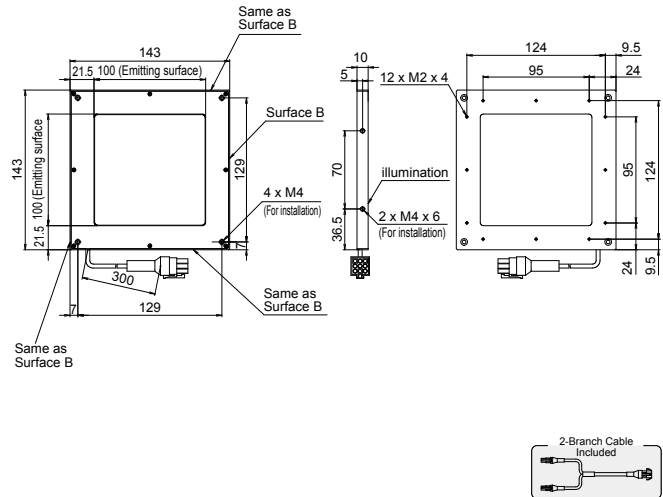


## ▷ Flat Dome Type LFXV-PF Series

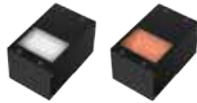


NEW

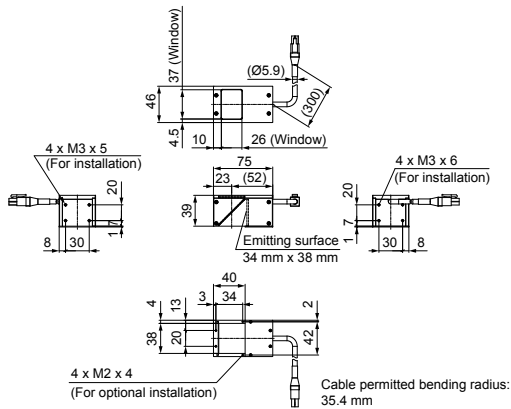
LFXV-PF-100SW/RD



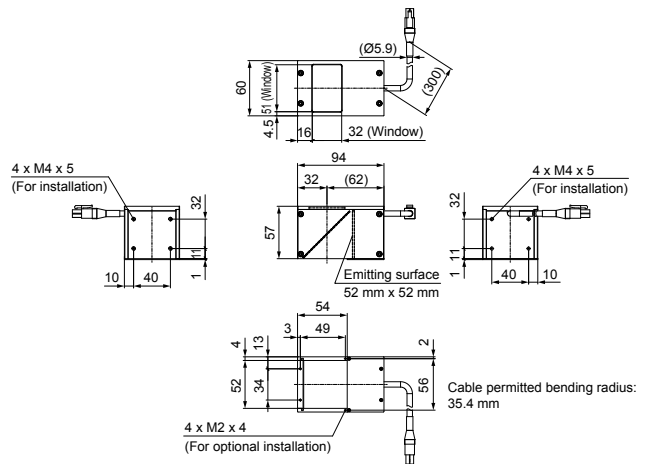
## ▷ Coaxial Type LFV-PF Series



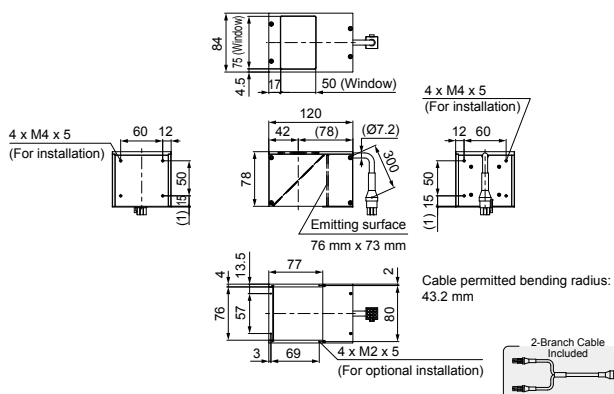
LFV-PF-35SW/RD



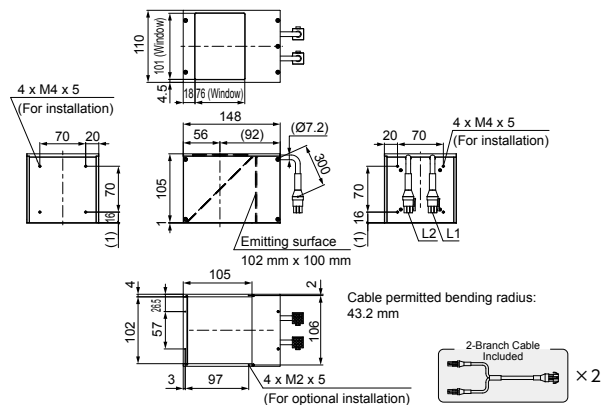
LFV-PF-50SW/RD



LFV-PF-70SW/RD



LFV-PF-100SW/RD



# High Power Strobe Control Units PF Series

## ▷ PF-A4048-2 (2-channel model)



### Features

- Light intensity: 512 levels
- Strobe time: 1 to 100  $\mu$ s
- Lighting delay: 0 to 100  $\mu$ s
- Compatible with Ethernet communications, etc.

## ▷ PF-A16048-4 (4-channel model)



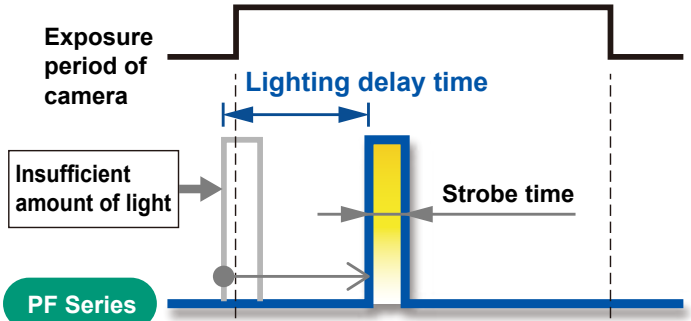
### Features

- Light intensity: 512 levels
- Strobe time: 1 to 500  $\mu$ s\*
- Lighting delay: 0 to 100  $\mu$ s
- Compatible with Ethernet communications
- Trigger link, etc.

\* Refer to the specification table.

## Freely Adjustable Flash Timing

You can use the lighting delay time setting of the control unit to adjust the timing of the flash to be within the exposure period of the camera.



Delaying the timing of the flash enables strobing within the exposure period of the camera.

## Specifications

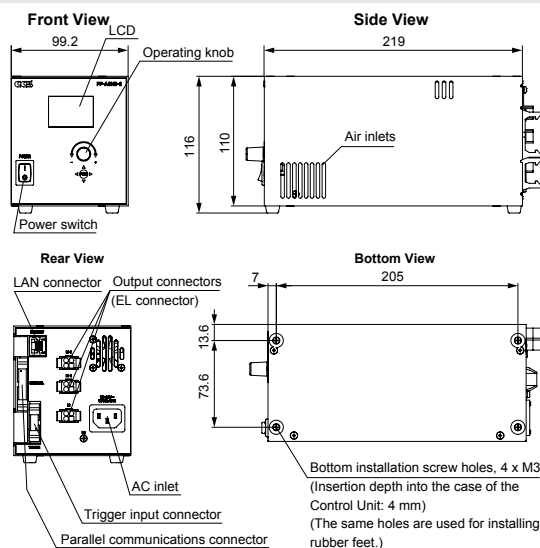
<b>Model name</b>	PF-A4048-2, PF-A16048-4	
<b>Lighting method</b>	Strobe lighting	
<b>Drive method</b>	Constant-voltage system	
<b>Intensity control method</b>	Variable-voltage control, Strobe time control	
<b>Number of channels</b>	PF-A4048-2: 2 channels, PF-A16048-4: 4 channels	
<b>Number of output connectors</b>	PF-A4048-2: L1: 2, L2: 1 PF-A16048-4: L1: 2, L2: 2, L3: 2, L4: 2	
<b>Applicable Light Unit (ratings)</b>	High Power Strobe Light Units from CCS	
<b>Output voltage settings</b>	Manual: Operation on the front panel External: Command input via TCP/IP or UDP/IP comm., Signal input through parallel port	512 levels
<b>Strobe time settings</b>	Manual: Operation on the front panel External: Command input via TCP/IP or UDP/IP comm., Signal input through parallel port	PF-A4048-2: 1 to 100 $\mu$ s (in steps of 0.1 $\mu$ s) PF-A16048-4: 1 to 500 $\mu$ s*
<b>Lighting delay settings</b>	Manual: Operation on the front panel External: Command input via TCP/IP or UDP/IP comm., Signal input through parallel port	0 to 100 $\mu$ s (in steps of 0.1 $\mu$ s)
<b>Input power</b>	100 to 240 VAC (+10%, -15%), 50/60 Hz	
<b>Power consumption (typ.)</b>	PF-A4048-2: 65 VA, PF-A16048-4: 140 VA	

\* For Ethernet communications: 1 to 100  $\mu$ s (in steps of 0.1  $\mu$ s), 100.5 to 500  $\mu$ s (in steps of 0.5  $\mu$ s)  
For parallel communications: Low strobe time range (1 to 100  $\mu$ s, in steps of 0.1  $\mu$ s), High strobe time range (5 to 500  $\mu$ s, in steps of 0.5  $\mu$ s)

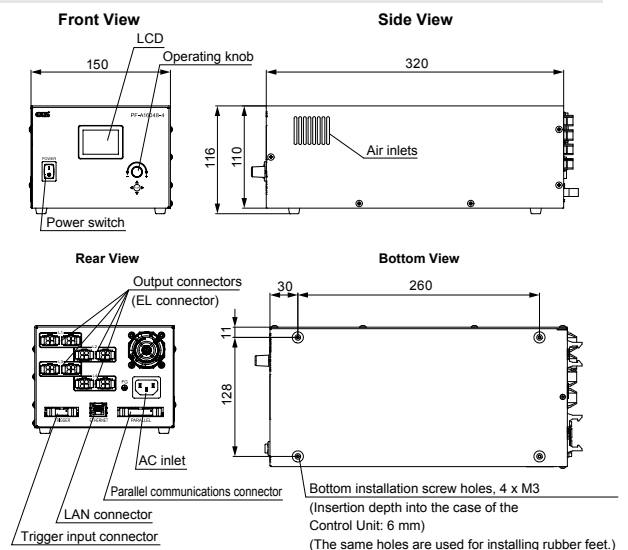
<b>Inrush current (typ.)</b>	PF-A4048-2: 15 A (at 100 VAC), 36 A (at 240 VAC) from a cold start PF-A16048-4: 17 A (at 100 VAC), 40.8 A (at 240 VAC) from a cold start
<b>Ground leakage current</b>	3.5 mA max. (264 VAC, 60 Hz, with no load)
<b>Output voltage (ratings)</b>	High intensity range: 33 to 48 VDC Low intensity range: 12 to 48 VDC
<b>Output current (peak)</b>	PF-A4048-2: 43.2 A total for 2 channels (21.6 A/connection), PF-A16048-4: 172.8 A total for 4 channels (21.6 A/connection)
<b>Insulation withstand voltage (input-output, input-FG)</b>	1500 VAC for one minute, Cutoff current: 10 mA, 500 VDC, 20 M $\Omega$ min.
<b>Overvoltage category</b>	Category II
<b>Operating environment</b>	Temperature: 0 to 40°C, Humidity: 20% to 85% (with no condensation) Altitude: 2,000 m max., Protective ground class: Class I, Pollution degree: 2, Indoor use only
<b>Storage environment</b>	Temperature: -20 to 60°C, Humidity: 20% to 85% (with no condensation)
<b>Cooling method</b>	Forced air cooling
<b>CE marking</b>	Safety standard: Conforms to EN 61010-1, EMC standard: Conforms to EN61000-6-2 and EN61000-6-4
<b>Environmental regulations</b>	RoHS compliant
<b>Material, coating, and surface processing</b>	Steel sheet, Cover thickness: 1.6 mm, Chassis thickness: 1.0 mm, Black (half matte)
<b>Weight</b>	PF-A4048-2: 1,900 g max., PF-A16048-4: 3,300 g max.
<b>Accessories</b>	Instruction guide, 2-m-long 3-prong AC power cord with ground terminal

## Dimensions (mm)

### PF-A4048-2



### PF-A16048-4

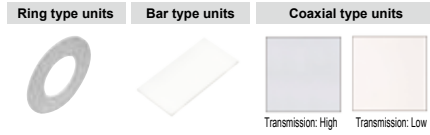


# Options

\* The model name "OO" indicates the size.

## Diffusion Plates

Reduces glare, especially problematic in the imaging of glossy workpieces.



Model name	Applicable Light Unit
DF-LDR-PF-OO	LDR-PF Series *1
DF-LDR-PF-OO-LA	LDR-PF-LA Series *1
DF-LDL-PF-OO	LDL-PF Series *2
DF-LFV3-OO (Transmission: High) *3	LFV-PF Series
DF-LFV3-OO-UF (Transmission: Low)	LFV-PF Series

\*1 An adapter is needed for attachment to the Light Unit.  
 \*2 The diffusion plate for "LDL-PF-33X8" is "DF-LDL2-33X8."  
 \*3 It is the same diffusion plate as the standard equipment.

## Polarizing Plates

Reduces glare when used in combination with a polarizing filter on the camera.



Model name	Applicable Light Unit
PL-LDR-PF-OO	LDR-PF Series *1
PL-LDL-PF-OO-HOVE *3	LDL-PF Series *2
PL-LFV3-OO	LFV-PF Series

\*1 An adapter is needed for attachment to the Light Unit.  
 \*2 The polarizing plate for "LDL-PF-33X8" is "PL-LDL2-33X8-HOVE."  
 \*3 HO: Light is polarized parallel to the longer edge of the plate.  
 VE: Light is polarized parallel to the shorter edge of the plate.

## Adapters

For attaching a diffusion plate or polarizing plate to the light unit.



Model name	Applicable Light Unit
AD-LDR-PF-OO	LDR-PF Series
AD-LDR-PF-OO-LA	LDR-PF-LA Series

## Protective Plates

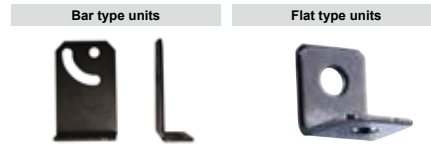
Protects the emitting part of the light unit.



Model name	Applicable Light Unit
PR-LFV3-OO	LFV-G-PF Series
PR-LFXV-OO	LFVX-PF Series

## Brackets

Secures light units.

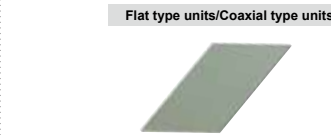


Model name	Applicable Light Unit
BK-LDL-PF	LDL-PF Series *1
BK-TH-LE12	TH-PF Series

\*1 The bracket for "LDL-PF-33X8" is "BK-LDL2."

## Light Control Films

Improves parallelism of light to reduce light diffraction.

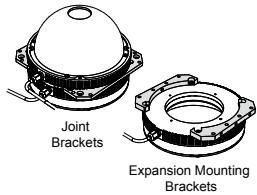


Model name	Applicable Light Unit
LC-LFV3-35	LFV-PF Series
LC-TH2-OO-HOVE *1	TH-PF Series

\*1 Model suffix -HOVE has a different lower direction.  
 HO: When installed with the cable outlet directly below, the lower direction is horizontal.  
 VE: When installed with the cable outlet directly below, the lower direction is vertical.

## Joint Brackets

Joint brackets are used to join a dome type unit with a ring or coaxial type unit.



### Light Joint Brackets

Model name	Applicable Light Unit ①	Applicable Light Unit ②
BK-75-JO	HPD-PF-75	HPR-PF-75
BK-100-JO	HPD-PF-100	HPR-PF-100
BK-150-JO	HPD-PF-150	HPR-PF-150
BK-200-JO	HPD-PF-200	HPR-PF-200

### Coaxial Light Joint Brackets

Model name	Applicable Light Unit ①	Applicable Light Unit ②
BK-HPD2-75-LFV	HPD-PF-75	LFV-PF-35
BK-HPD2-100-LFV	HPD-PF-100	LFV-PF-50
BK-HPD2-150-LFV	HPD-PF-150	

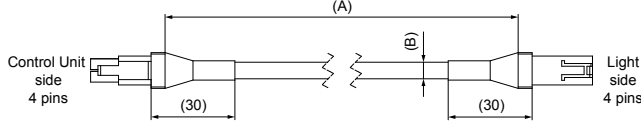
### Expansion Mounting Brackets

Model name	Applicable Light Unit
BK-75-CI	HPD-PF-75/HPR-PF-75
BK-100-CI	HPD-PF-100/HPR-PF-100
BK-150-CI	HPD-PF-150/HPR-PF-150
BK-200-CI	HPD-PF-200/HPR-PF-200

## Cables

Connects a light unit and control unit.

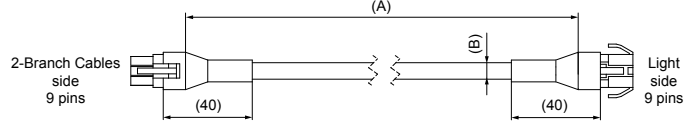
### FCB-PF



Model name	Dimension A	Dimension B	Permitted bending radius *	Weight
FCB-1-PF	1 m	Ø5.9	35.4 mm	100 g
FCB-2-PF	2 m			150 g
FCB-3-PF	3 m			200 g
FCB-5-PF	5 m			450 g

\* The cable permitted bending radii shown below are for reference only. Actual values may vary.

### FCB-PF-EL9



Model name	Dimension A	Dimension B	Permitted bending radius *	Weight
FCB-1-PF-EL9	1 m	Ø7.4	44.4 mm	100 g
FCB-2-PF-EL9	2 m			190 g
FCB-3-PF-EL9	3 m			270 g
FCB-5-PF-EL9	5 m			680 g

\* The cable permitted bending radii shown below are for reference only. Actual values may vary.

■ "CCS" and "LIGHTING SOLUTION" are registered trademarks or trademarks of CCS Inc.

## Notes

- To ensure proper and safe use of the product, please read the Instruction Guide completely before using the product.
- The design and specifications of this product are subject to change without notification for product improvement.



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