High Power Strobe LED Light Units
LDR-PF-LA / LFV-PF Series

Realizes High-Speed and Accurate Inspection

Low-Angle Ring Lights Are Now Available
Ultra-High Output Power Required for Dark Field Lighting

LDR-PF-LA Series

10 Million \(\text{lx}\)

Peak illuminance of LDR-PF-75SW-LA (Illuminating distance: 10 mm)

Expanded Line of Coaxial Lights
Now Applicable to Large Workpieces

LFV-PF Series

26 \(\text{lx}\)

Peak illuminance of LFV-PF-100SW (Illuminating distance: 10 mm)

*1 Comparison of the peak radiances between the following pairs of products:
  - Conventional LDR-274SW2-LA Light Unit and the POD-series Overdrive Control Unit
  - LDR-PF-75SW-LA and the Dedicated Control Unit

*2 Comparison of the peak irradiances between the following pairs of products:
  - Conventional LFV-3100SW Light Unit and the POD-series Overdrive Control Unit
  - LFV-PF-100SW and the Dedicated Control Unit
High Power Strobe  Low-Angle Ring Lights

LDR-PF-LA

Making High-Speed Inspection Possible

In order to speed up a production line, it is essential to improve the processing speed of the inspection system. Remarkably high brightness of the High Power Strobe Lights enables high-speed and accurate inspections.

**Brightness Up to 31x That of Conventional Products**

**Comparison of the Peak Radiance**

<table>
<thead>
<tr>
<th>White Light Units</th>
<th>Red Light Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conventional</strong></td>
<td><strong>Conventional</strong></td>
</tr>
<tr>
<td>LDR2-74SW2-LA + POD Control Unit</td>
<td>LDR2-74RD2-LA + POD Control Unit</td>
</tr>
<tr>
<td><strong>LDR-PF-LA</strong></td>
<td><strong>LDR-PF-LA</strong></td>
</tr>
<tr>
<td><strong>Peak radiance</strong></td>
<td><strong>Peak radiance</strong></td>
</tr>
<tr>
<td>Up to 31x</td>
<td>Up to 12x</td>
</tr>
<tr>
<td>That of Conventional Products</td>
<td>That of Conventional Products</td>
</tr>
</tbody>
</table>

*1 Comparison of the peak radiances between the following pairs of products:
- Conventional LDR2-74SW2-LA Light Unit and the POD-series Overdrive Control Unit
- LDR-PF-75SW-LA and the Dedicated Control Unit

*2 Comparison of the peak radiances between the following pairs of products:
- Conventional LDR2-74RD2-LA Light Unit and the POD-series Overdrive Control Unit
- LDR-PF-75RD-LA and the Dedicated Control Unit

The data current as of July 2018. Comparison using our measurement conditions. The data included is for reference only. Actual values may vary.

**High Power Direct-Light from a Low Angle**

Effective for edge detection and observing shallow scratches on the surface of a workpiece. Extremely strong direct-light from the LDR-PF-LA-series Light Unit enables you to capture the irregularities of the workpiece.

**Imaging Glass Scratches**

Extremely strong light from a low angle is also applicable to dark field illumination. This is well-suited for imaging shallow scratches on the glass surface.

It is difficult to capture the scratch with a combination of conventional Light Unit and Overdrive Control Unit.

Extremely strong strobe light makes it possible to clearly highlight the scratch.

**Short Exposure Time**

**Conventional Products**

Long exposure time due to lack of brightness leads to image blurring.

Difficult to increase inspection speed.

**LDR-PF-LA Series**

High brightness allows for short exposure time and reduces blur.

Inspection speed can be increased.

**Depth of Field**

**Conventional Products**

Wide lens aperture due to lack of brightness leads to decrease in the depth of field.

It is difficult to detect edges and observe shallow scratches. Vibration and changes in the height of the workpiece affect the image.

**LDR-PF-LA Series**

High brightness allows for small lens aperture and increases the depth of field.

Edges and shallow scratches are clearly imaged. Vibration and changes in the height of the workpiece will not affect the image.
Comparison of Images

Imaging the Appearance of Medicine Tablets with Imprinted Text

Workpiece

LDR2-100SW2-LA + POD Control Unit

It is difficult to capture the workpiece with a combination of conventional Light Unit and Overdrive Control Unit.

Imaging Conditions

FOV: 30 mm, Shutter speed: 1/18000 s, f-stop: F22, Strobe time: 31 μs, Light intensity: Maximum

Extremely strong strobe light allows you to capture the workpiece.

Application Examples

Inspection for engravings, damage, or stains on metal surfaces; edge detection; appearance inspection of medicine; inspection for foreign material mixed with medicine; inspection for scratches on glass surface; etc.

Product Lineup

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

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

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

Light Unit Specifications

<table>
<thead>
<tr>
<th>Model name</th>
<th>LED color</th>
<th>Peak current</th>
<th>Peak wavelength / correlated color temperature</th>
<th>Optional accessories</th>
<th>Extension cables</th>
<th>Dedicated Control Units</th>
<th>Weight</th>
<th>Light spectrum</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDR-PF-75RD-LA</td>
<td>Red</td>
<td>16.2 A</td>
<td>622 nm, 8,000 K</td>
<td></td>
<td></td>
<td>FCB-PF EL3 (Dedicated cable)</td>
<td>125 g</td>
<td></td>
</tr>
<tr>
<td>LDR-PF-75SW-LA</td>
<td>White</td>
<td>28.8 A</td>
<td>622 nm, 8,000 K</td>
<td></td>
<td></td>
<td>FCB-PF EL3 (Dedicated cable)</td>
<td>200 g</td>
<td></td>
</tr>
<tr>
<td>LDR-PF-100RD-LA</td>
<td>Red</td>
<td>42.0 A</td>
<td>622 nm, 8,000 K</td>
<td></td>
<td></td>
<td>FCB-PF EL3 (Dedicated cable)</td>
<td>350 g</td>
<td></td>
</tr>
<tr>
<td>LDR-PF-100SW-LA</td>
<td>White</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Optional Accessories (Sold Separately)

Diffusion Plates

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

Model name

Applicable Light Unit (Common for all colors)

DF-LDR-PF-75-LA

LDR-PF-75-LA

DF-LDR-PF-100-LA

LDR-PF-100-LA

DF-LDR-PF-150-LA

LDR-PF-150-LA

Use a Mounting Adapter to install the Diffusion Plate.

Mounting Adapters

Necessary for mounting a Diffusion Plate on the Light Unit.

Model name

Applicable Light Unit (Common for all colors)

AD-LDR-PF-75-LA

LDR-PF-75-LA

AD-LDR-PF-100-LA

LDR-PF-100-LA

AD-LDR-PF-150-LA

LDR-PF-150-LA

Periodically inspect optional accessories such as polarizing and diffusion plates as all of these are consumables. Replace any parts that show discoloration or deformation during inspection. CCS recommends maintaining extra optional accessories on-hand in order to be prepared for replacement.

Dimensions

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

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

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

Cable permitted bending radius: 22 mm

Cable permitted bending radius: 43.2 mm

Cable permitted bending radius: 43.2 mm
**High Power Strobe Coaxial Lights**

**LFV-PF Series**

**Expanded Line of the Coaxial Lights LFV-PF Series**

*Illuminating Mechanism of LFV-PF-100*

Diffused light from the LEDs is reflected on the half mirror and directed vertically downward on the same axis as the camera axis. This evenly illuminates glossy surfaces and mirrors so that the irregularities of the workpiece will be highlighted in the image.

*Structure of the LFV-PF Series*

- **Optical glass**
  - The camera window and half mirror are made of optical glass that is also used for laser light source interferometry.
  - Surface roughness of 0.3 μm in our evaluation.

- **Aluminum alloy case**
  - Achieved excellent heat dissipation and robustness.

**Brightness Up to 26x That of Conventional Products**

**Comparison of the Peak Irradiances**

<table>
<thead>
<tr>
<th>White Light Units</th>
<th>Red Light Units</th>
</tr>
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<tbody>
<tr>
<td>Conventional product</td>
<td>LFV-PF-100RD + POD Control Unit</td>
</tr>
<tr>
<td>LFV3-100SW + POD Control Unit</td>
<td>LFV-PF-100RD + Dedicated Control Unit</td>
</tr>
</tbody>
</table>

*1 Comparison of the peak irradiances between the following pairs of products:
- Conventional LFV3-100SW Light Unit and the POD-series Overdrive Control Unit
- LFV-PF-100RD and the Dedicated Control Unit

*2 Comparison of the peak irradiances between the following pairs of products:
- Conventional LFV3-100RD Light Unit and the POD-series Overdrive Control Unit
- LFV-PF-100RD and the Dedicated Control Unit

The data current as of July 2018. Comparison using our measurement conditions. The data included is for reference only. Actual values may vary.

**Comparison of Images**

*Appearance Inspection of Cans*

Insufficient brightness of the conventional Light Unit makes it difficult to capture the workpiece.

High brightness of High Power Strobe Light allows you to capture the workpiece.

**Imaging Conditions**
- FOV: 85 mm, Shutter speed: 1/18000 s, f-stop: F16, Strobe time: 31 μs, Light intensity: Maximum

**Application Examples**
- Inspection for fault, damage, scratches, engravings, or dents on glossy surfaces or mirrors; appearance inspection of automobile components, beverage containers, and food; inspection for damage and dents on resin molded products; etc.

**Product Lineup**

*Two New Sizes Are Now Available. Large Sizes Offering a Wide Field of View.*

- **LFV-PF-35RD / SW**
- **LFV-PF-50RD / SW**
- **LFV-PF-70RD / SW**
- **LFV-PF-100RD / SW**

"Popular"

"New Size Available"
**Light Unit Specifications**

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<th>Light spectrum</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFV-PF-35RD</td>
<td>Red</td>
<td>10.8 A</td>
<td>627 nm</td>
<td></td>
<td>FCB-PF</td>
<td>PF-A6048-2</td>
<td>230 g</td>
<td>Red 627 nm</td>
</tr>
<tr>
<td>LFV-PF-35SW</td>
<td>White</td>
<td>14.4 A</td>
<td>7,800 K</td>
<td></td>
<td>FCB-PF</td>
<td>PF-A6048-4</td>
<td>400 g</td>
<td>Red 627 nm</td>
</tr>
<tr>
<td>LFV-PF-50RD</td>
<td>Red</td>
<td>18 A</td>
<td>627 nm</td>
<td></td>
<td>FCB-PF</td>
<td>PF-A61048-2</td>
<td>800 g</td>
<td>Red 627 nm</td>
</tr>
<tr>
<td>LFV-PF-50SW</td>
<td>White</td>
<td>37.8 A</td>
<td>7,800 K</td>
<td></td>
<td>FCB-PF</td>
<td>PF-A61048-4</td>
<td>1,400 g</td>
<td>Red 627 nm</td>
</tr>
<tr>
<td>LFV-PF-100RD</td>
<td>Red</td>
<td>46.8 A*1</td>
<td>627 nm</td>
<td></td>
<td>FCB-PF</td>
<td>PF-A61048-4</td>
<td>1,400 g</td>
<td>Red 627 nm</td>
</tr>
<tr>
<td>LFV-PF-100SW</td>
<td>White</td>
<td>64.8 A*2</td>
<td>7,800 K</td>
<td></td>
<td>FCB-PF</td>
<td>PF-A61048-4</td>
<td>1,400 g</td>
<td>Red 627 nm</td>
</tr>
</tbody>
</table>

*1 L1 connector: 25.2 A, L2 connector: 23.4 A
*2 L1 connector: 32.4 A, L2 connector: 32.4 A

**Optional Accessories (Sold Separately)**

- **Diffusion Plates**
  - Replace the factory-installed Diffusion Plate if you want to change the transmission.
  - For the LFV-PF-70/100 Light Units, you can adjust the position of the Diffusion Plate.

- **Polarizing Plates**
  - Reduces glare when used in combination with a polarizing filter on the camera.

- **Light Control Films**
  - Improves parallelism of light to reduce light diffraction so that the outline of the workplace will be clearly imaged in the appearance inspection.

**Dimensions**

- **LFV-PF-35RD / SW**
  - Half mirror: Emitting surface: 34 mm x 38 mm
  - Cable permitted bending radius: 35.4 mm

- **LFV-PF-50RD / SW**
  - Half mirror: Emitting surface: 52 mm x 52 mm
  - Cable permitted bending radius: 35.4 mm

- **LFV-PF-70RD / SW**
  - Half mirror: Emitting surface: 76 mm x 73 mm
  - Cable permitted bending radius: 43.2 mm

- **LFV-PF-100RD / SW**
  - Half mirror: Emitting surface: 102 mm x 100 mm
  - Cable permitted bending radius: 43.2 mm

The data included is for reference only. Actual values may vary.
Data (Typical Examples)

**Low-Angle Ring Lights LDR-PF-LA Series**

- **LDR-PF-75RD-LA / SW-LA**
  - LWD Characteristics
  - Uniformity

- **LDR-PF-100RD-LA / SW-LA**
  - LWD Characteristics
  - Uniformity

- **LDR-PF-150RD-LA / SW-LA**
  - LWD Characteristics
  - Uniformity

**Coaxial Lights LFV-PF Series**

- **LFV-PF-35RD / SW**
  - LWD Characteristics
  - Uniformity

- **LFV-PF-70RD / SW**
  - LWD Characteristics
  - Uniformity

- **LFV-PF-100RD / SW**
  - LWD Characteristics
  - Uniformity

The data included is for reference only. Actual values may vary.
Maximize the Performance of High Power Strobe Light Units

PF-A4048-2 (2 channels)
- Light intensity: 512 levels
- Strobe time: 1 to 100 μs
- Lighting delay: 0 to 100 μs (in steps of 0.1 μs)
- Compatible with Ethernet and parallel communications
- Selectable light intensity ranges, etc.

PF-A16048-4 (4 channels)
- Light intensity: 512 levels
- Strobe time: 1 to 500 μs
- Lighting delay: 0 to 100 μs (in steps of 0.1 μs)
- Compatible with Ethernet and parallel communications
- Selectable light intensity ranges
- Trigger link, etc.

You can make the Light Units on more than one channel flash linked to a trigger signal that is input through one of the pins in the trigger input connector.

For detailed information, refer to the note in the specification table below.

Specifications

Model name: PF-A4048-2, PF-A16048-4
Lighting method: Strobe lighting
Drive method: Constant-voltage system
Intensity control method: Variable-voltage control, Strobe time control
Number of channels: PF-A4048-2: 2 channels, PF-A16048-4: 4 channels
Number of output connectors
- PF-A4048-2: L1, 2, L2, 1
- PF-A16048-4: L1, 2, L2: 2, L3, 2, L4: 2
Applicable Light Units:
- High Power Strobe Light Units from CCS
  - Number of connectors
  - LCD
  - Operating knob
  - Power switch
  - AC inlet
  - Air inlets

Parallel Communications
- Signal input through parallel port
- Operation on the front panel
- Command input via TCP/IP or UDP/IP communication

Strobe time settings
- Manual: Operation on the front panel
- External: Command input via TCP/IP or UDP/IP communication
- Signal input through parallel port

Lighting delay settings
- Manual: Operation on the front panel
- External: Command input via TCP/IP or UDP/IP communication
- Signal input through parallel port

Lighting method: Strobe lighting
Model name: PF-A4048-2, PF-A16048-4

Optional Accessories (Sold Separately)
- Trigger Input Cable
  - EXCB2-M10-3
- Parallel Communications Cable
  - EXCB2-M20-3
- Parallel Communications and Trigger Input Branch Cable
  - EXCB2-M10M20-3

Dimensions

For the dimensional drawings, refer to the note in the specification table below.

For parallel communications:
- Low strobe time range (1 to 100 μs)
- Compatible with Ethernet and parallel communications

For Ethernet communications:
- 1 to 100 μs

* For the detailed information, refer to the note on the specification table below.

Dedicated Control Units PF-A4048-2 and PF-A16048-4
Covering a Wide Range of Uses with Various Types of Lights

Optional Accessories (Sold Separately)

Dedicated Extension Cables

Applicable models: LDR-PF-75-LA and LFV-35/50 series

<table>
<thead>
<tr>
<th>Model name</th>
<th>Dimension A</th>
<th>Dimension B</th>
<th>Permitted bending radius</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCB-1-PF</td>
<td>1 m</td>
<td>Ø5.9</td>
<td>34.5 mm</td>
<td>100 g</td>
</tr>
<tr>
<td>FCB-2-PF</td>
<td>2 m</td>
<td>Ø5.9</td>
<td>34.5 mm</td>
<td>150 g</td>
</tr>
<tr>
<td>FCB-3-PF</td>
<td>3 m</td>
<td>Ø5.9</td>
<td>34.5 mm</td>
<td>200 g</td>
</tr>
<tr>
<td>FCB-5-PF</td>
<td>5 m</td>
<td>Ø7.0</td>
<td>42.0 mm</td>
<td>450 g</td>
</tr>
</tbody>
</table>

Applicable models: LDR-PF-100-LA / 150-LA and LFV-70/100 series

<table>
<thead>
<tr>
<th>Model name</th>
<th>Dimension A</th>
<th>Dimension B</th>
<th>Permitted bending radius</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCB-1-PFEL9</td>
<td>1 m</td>
<td>Ø7.4</td>
<td>44.4 mm</td>
<td>100 g</td>
</tr>
<tr>
<td>FCB-2-PFEL9</td>
<td>2 m</td>
<td>Ø7.4</td>
<td>44.4 mm</td>
<td>150 g</td>
</tr>
<tr>
<td>FCB-3-PFEL9</td>
<td>3 m</td>
<td>Ø7.4</td>
<td>44.4 mm</td>
<td>200 g</td>
</tr>
<tr>
<td>FCB-5-PFEL9</td>
<td>5 m</td>
<td>Ø9.1</td>
<td>54.6 mm</td>
<td>680 g</td>
</tr>
</tbody>
</table>

* These cable permitted bending radii are for reference only. Actual values may vary.

How to Connect the Extension Cables

- For LDR-PF-75-LA

- For LDR-PF-100-LA / LDR-PF-150-LA

- For LFV-PF-35 / LFV-PF-50

- For LFV-PF-100

- For LFV-PF-70

CAUTION

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. The works in progress examples included in this brochure are intended to serve only as references to help you select a suitable Light Unit. Please verify the functionality and conditions required for your particular application before you make a final selection. The sample works in progress used in this brochure have been processed specifically for sample imaging. They are not intended to represent product quality and performance.

For information on your nearest CCS office, refer to our website: https://www.ccs-grp.com/office/

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