LF1D/LF2D
LED Illumination Units

Wide-area lighting for improved target visibility.
A wide variety of sizes and light distribution angles.
Durable and environmentally resistant
**LF1D/LF2D LED Illumination Units**

A variety of sizes and light distribution angles for various sizes and types of machine.

- Water, dust, oil-proof IP67, IP67F (reinforced glass illumination surface), IP69K (LF1D) degree of protection.
- Robust housing of aluminum diecast, stainless steel, and reinforced glass.

**LF1D-C (mini)**
- Compact profile of 100 x 50 x 25 mm.
- No-multi shadow light illuminate the small surface scratches and irregularity of target objects, improving the processing accuracy.
- Wide 120° distribution angle.

**LF1D-EH / LF2D-EH / LF1D-FH / LF2D-FH (slim/wide)**
- Lights the target object and the periphery in wide angle. Suitable for middle-sized machines.
- The terminal block and spring clamp connections ensure easy wiring and installation. Combination with angle adjustable mounting bracket enables installation in various applications.

**LF1D-H / LF1D-J (long)**
- Two length available (365 mm and 510 mm).
- Flat, no-multi shadow light with less glare illuminates the small surface scratches and irregularity of target objects from a distance, improving the processing accuracy.
- Wide 120° distribution angle. High-power 2000/3000 lm luminous flux is suitable for replacing fluorescent light.

**Application Examples**
- Machine tools, food processing equipment, automatic manufacturing machines, printing machines, production system, and test equipment.

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### LF1D-C (mini, illumination color: white)

<table>
<thead>
<tr>
<th>Cable</th>
<th>Length</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>With  (side)</td>
<td>3m</td>
<td>LF1D-C2F-2W-330</td>
</tr>
<tr>
<td></td>
<td>5m</td>
<td>LF1D-C2F-2W-350</td>
</tr>
<tr>
<td>With  (back)</td>
<td>3m</td>
<td>LF1D-C2F-2W-430</td>
</tr>
<tr>
<td></td>
<td>5m</td>
<td>LF1D-C2F-2W-450</td>
</tr>
</tbody>
</table>

### LF1D-EH/FH (slim/wide, wide angle & high illuminance, shape: box, illumination color: white)

<table>
<thead>
<tr>
<th>Style</th>
<th>Optional Accessories</th>
<th>Slim (LF1D-EH)</th>
<th>Wide (LF1D-FH)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cable Gland LF9Z-A11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cable (5m) LF9Z-C05</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mounting Bracket LF9Z-B11, B12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without (cable gland hole on the side)</td>
<td>With</td>
<td>LF1D-EH2F-2W</td>
<td>LF1D-EH3G-2W</td>
</tr>
<tr>
<td>With (side)</td>
<td></td>
<td>LF1D-EH2F-2W-200</td>
<td>LF1D-EH3G-2W-200</td>
</tr>
<tr>
<td>With (back)</td>
<td></td>
<td>LF1D-EH2F-2W-201</td>
<td>LF1D-EH3G-2W-201</td>
</tr>
<tr>
<td>With (side)</td>
<td></td>
<td>LF1D-EH2F-2W-300</td>
<td>LF1D-EH3G-2W-300</td>
</tr>
<tr>
<td>With (back)</td>
<td></td>
<td>LF1D-EH2F-2W-301</td>
<td>LF1D-EH3G-2W-301</td>
</tr>
<tr>
<td>With (back)</td>
<td></td>
<td>LF1D-EH2F-2W-351</td>
<td>LF1D-EH3G-2W-351</td>
</tr>
</tbody>
</table>

Package Quantity: 1

### LF2D-EH/FH (slim/wide, wide angle & high illuminance, shape: flange, illumination color: white)

<table>
<thead>
<tr>
<th>Style</th>
<th>Optional Accessories</th>
<th>Slim (LF2D-EH)</th>
<th>Wide (LF2D-FH)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cable Gland LF9Z-A11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cable (5m) LF9Z-C05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With (side)</td>
<td></td>
<td>LF2D-EH2F-2W-300</td>
<td>LF2D-EH3G-2W-300</td>
</tr>
<tr>
<td>With (back)</td>
<td></td>
<td>LF2D-EH2F-2W-400</td>
<td>LF2D-EH3G-2W-400</td>
</tr>
<tr>
<td>With (back)</td>
<td></td>
<td>LF2D-EH2F-2W-450</td>
<td>LF2D-EH3G-2W-450</td>
</tr>
</tbody>
</table>

Package Quantity: 1
LF1D/LF2D LED Illumination Units

**LF1D-H (long model 365 mm, illumination color: neutral white)**

<table>
<thead>
<tr>
<th>Cable Length</th>
<th>Part No.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5m</td>
<td>LF1D-H2F-2N-350</td>
<td></td>
</tr>
<tr>
<td>1.5m + M12 connector</td>
<td>LF1D-H2F-2N-3B0</td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5m</td>
<td>LF1D-H2F-2N-450</td>
<td></td>
</tr>
<tr>
<td>1.5m + M12 connector</td>
<td>LF1D-H2F-2N-4B0</td>
<td></td>
</tr>
</tbody>
</table>

**LF1D-J (long model 510 mm, illumination color: neutral white)**

<table>
<thead>
<tr>
<th>Cable Length</th>
<th>Part No.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5m</td>
<td>LF1D-J2F-2N-350</td>
<td></td>
</tr>
<tr>
<td>1.5m + M12 connector</td>
<td>LF1D-J2F-2N-3B0</td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5m</td>
<td>LF1D-J2F-2N-450</td>
<td></td>
</tr>
<tr>
<td>1.5m + M12 connector</td>
<td>LF1D-J2F-2N-4B0</td>
<td></td>
</tr>
</tbody>
</table>

**Specifications**

- **Model**: LF1D-C, LF1D-E/LF1D-EH, LF1D-F/LF1D-FH, LF1D-H, LF1D-J
- **Style**: Mini, Slim
- **Light Distribution**: Blank, Standard, Wide
- **Degree of Protection**: Blank, Standard, Wide
- **Voltage**: 24V DC
- **Illumination Color**: White (5,700K), Neutral White (4,700K)
- **Part No. Development**

**Part No. Structure**

- **Series**: LF
- **Shape**: Box, Flange
- **Style**: Mini, Slim, Wide, Long (365 mm), Long (510 mm)
- **Light Distribution**: Blank, Standard, Wide angle & High illuminance
- **Degree of Protection**: Blank, Standard, Wide
- **Voltage**: 24V DC
- **Illumination Color**: White (5,700K), Neutral White (4,700K)
- **Material**: Housing: aluminum, Front cover: stainless steel, Illumination surface: reinforced glass
- **Weight (approx.)**: LF1D-C2F-2W-350D: 420g

**Degree of Protection**

- **IP67 (all models)**
- **IP67F (reinforced glass illumination surface)**
- **IP69K (LF1D)**

**Material (Note 3)**

- **Housing**: aluminum
- **Front cover**: stainless steel
- **Illumination surface**: reinforced glass

**Weight (approx.)**

- LF1D-E (H): 372g, LF1D-F (H): 520g

**Note 1**: LED life depends on the operating environment.

**Note 2**: Waterproof or oil-proof characteristics specified by IEC 60529 (IP67) and DIN40050-9 (IP69K). For illumination units without accessories, use a cable gland and cable that satisfy the required degree of protection.

**Note 3**: The reinforced glass and polycarbonate illumination surfaces have the same appearance, but have different degrees of protection.

(13/02/01)
# LF1D/LF2D LED Illumination Units

## LED Optical Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>LF1D-C</th>
<th>LF1D-E/LF2D-E</th>
<th>LF1D-EH/LF2D-EH</th>
<th>LF1D-F/LF2D-F</th>
<th>LF1D-FH/LF2D-FH</th>
<th>LF1D-H</th>
<th>LF1D-J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style</td>
<td>Mini</td>
<td>Slim</td>
<td>Slim (wide angle &amp; high illuminance)</td>
<td>Wide</td>
<td>Wide (wide angle &amp; high illuminance)</td>
<td>Long (365 mm)</td>
<td>Long (510 mm)</td>
</tr>
<tr>
<td>Illumination Color</td>
<td>White</td>
<td>Neutral White</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color Temp. (typ.)</td>
<td>5,700 K</td>
<td>4,700 K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Luminous Flux (typ.)</td>
<td>560 lm</td>
<td>600 lm</td>
<td>1,000 lm</td>
<td>840 lm</td>
<td>1,280 lm</td>
<td>2,000 lm</td>
<td>3,000 lm</td>
</tr>
<tr>
<td>Reference Illuminance (typ.) at 1.0 m directly below</td>
<td>180 lx</td>
<td>1,100 lx</td>
<td>1,450 lx</td>
<td>1,100 lx</td>
<td>1,200 lx</td>
<td>560 lx</td>
<td>840 lx</td>
</tr>
</tbody>
</table>

* LED modules and illumination units may vary in illumination color and illuminance.

## Light Distribution Characteristics at 1.0 m

**LF1D-C**

![Graph](image)

**LF1D/2D-EH**

![Graph](image)

**LF1D/2D-FH**

![Graph](image)

## Light Distribution Curve

**LF1D-C**

![Graph](image)

**LF1D/2D-EH**

![Graph](image)

**LF1D/2D-FH**

![Graph](image)

## Internal Circuit

**LF1D-C**

![Diagram](image)

**LF1D-E(H)/LF1D-F(H)**

![Diagram](image)

**LF1D/H/LF1D-J**

![Diagram](image)
Dimensions

**LF1D-C (Mini Model)**

![Diagram of LF1D-C (Mini Model)]

**Notes:**
- When leading the cable from the cable gland on the back, provide a hole in the mounting plate.
- Also, provide a proper sealing.
- Recommended M5 screw:
  - Screw head height: 9.5mm max.
  - Screw head diameter: 10mm max.
  - Screw length: 20mm min.
- Recommended washer diameter: 10mm max.

**LF1D-D/EH (Slim Model/Box) (10 LEDs x 1 row)**

![Diagram of LF1D-D/EH (Slim Model/Box)]

**Notes:**
- When leading the cable from the cable gland on the back, provide a hole in the mounting plate.
- Note 1: When using the angle adjustable mounting bracket, the tolerance is ±2.5 when the gasket diameter is larger than ø10 and ø12 or smaller.
- Note 2: When using no accessories, the tolerance is ±2.5 when the gasket diameter is larger than ø10 and ø12 or smaller.

**All dimensions in mm.**

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*Note:*(Note 1) When leading the cable from the cable gland on the back, provide a hole in the mounting plate.

*Also, provide a proper sealing. Recommended M5 screw:
- Screw head height: 9.5mm max.
- Screw head diameter: 10mm max.
- Screw length: 20mm min.
- Recommended washer diameter: 10mm max.*
LF1D/LF2D LED Illumination Units

**LF2D-E/EH (Slim Model/Flange) (10 LEDs × 1 row)**

- Axis Center
- 6-M5x10 Hexagon Socket
- Gasket (supplied with LF2D)
- Brown: L (+) Blue: N (-) Pink: ( )
- Cable Length: 5m
- Note: External diameter of cable gland is ø20mm

**Mounting Hole Layout**

- Panel thickness: 5 max
- 6-M5 Screws
- 4-M5 P0.8 Effective thread: 10mm
- 4-M5 P0.8 Effective thread: 10mm
- M8 P1.0 Effective thread: 5mm

**LF1D-F/FH (Wide Model/Box) (7 LEDs × 2 rows)**

- Axis Center
- Illumination Surface
- Front Cover
- Cable Length: 5m
- Brown: L (+) Blue: N (-) Pink: (-)
- Parially-stripped (×2) 24AWG

**Mounting Hole Layout**

- 4-M5 Screws
- LF9Z-1MDE1 (Angle Adjustable Mounting Bracket)
- Angle: 0°
- Angle: 90°

**Note 1:** When leading the cable from the cable gland on the back, provide a hole in the mounting plate.

**Note 2:** When using the angle adjustable mounting bracket, the tolerance is ±374 when the gasket diameter is larger than ø10 and ø12 or smaller.

All dimensions in mm.

(13/02/01)
LF1D-F/FH (Wide Model/Flange) (7 LEDs x 2 rows)

Mounting Hole Layout

LF1D-H (Long Model, 365 mm)

Mounting Hole Layout

Note 1: When leading the cable from the cable gland on the back, provide a hole in the mounting plate. A ø16 hole is necessary when using the LF1D-3F2N-B (M12 connector type).

Note 2: Choose mounting screws in consideration of mounting plate thickness.

All dimensions in mm.

(13/02/01)
Safety Precautions

- Do not disassemble, repair, or modify the LF1D/2D. Otherwise electric shock, fire, or malfunction may occur.
- Before wiring, confirm that the LF1D/2D has cooled down sufficiently.
- Ensure the correct operating temperature. Otherwise internal temperature rise may result in damage.
- LED illumination unit is general-purpose industrial electric device. Do not use for electronic equipment which may damage the human body or threaten life in case a malfunction or failure occurs.
- Make sure of correct wiring, otherwise electric shock or damage may result.
- Do not stare directly into the LED illumination unit while it is lit, and do not project the light to other people, otherwise eyes may be injured.

Instructions

- LED modules may vary in illumination colors and illuminance.
- Before designing equipment and powering up illumination units, confirm the specifications described in the instruction sheet.
- Apply voltage within the rated value, otherwise the LED elements may be damaged.
- Do not use or store in a place subjected to vibration and shock. Otherwise electric shock or failure occurs.
- To clean the cover, use a soft cloth with water or neutral detergent. Do not use solvents such as thinners, benzene, or alkaline, otherwise discoloration, deterioration, or decrease in strength may occur.

Specifications and other descriptions in this catalog are subject to change without notice.