

# INSTRUCTION SHEET

## LF1D-E LED Illumination Unit LF1D-E Series

Confirm that the delivered product is what you have ordered. Read this instruction sheet to make sure of correct operation. Make sure that the instruction sheet is kept by the end user.

### Safety Precautions

In this operation instruction sheet, safety precautions are categorized in order of importance to Warning and Caution :

#### WARNING

Warning notices are used to emphasize that improper operation may cause severe personal injury or death.

#### CAUTION

Caution notices are used where inattention might cause personal injury or damage to equipment.

#### WARNING

- Before designing the final equipment and powering up the LF1D-E illumination unit, confirm the specifications scribed on this sheet. If there is any uncertainty in the description, contact IDEC before powering up the LF1D-E illumination unit.
- Do not disassemble, repair, or modify the LF1D-E illumination unit, otherwise severe accidents may result, such as electric shocks, damage, fire, or malfunction.
- Turn off the power to the LF1D-E illumination unit before wiring. Make sure of correct wiring, otherwise electric shocks or damage may result.
- Do not gaze into the LF1D-E illumination unit while it is lit, and do not project the light to other people, otherwise eyes may be injured.
- Make sure that the LF1D-E illumination unit does not fall during transportation, installation, and operation, otherwise damage may result.
- Do not pull out or push in the cable of the LF1D-E illumination unit, otherwise damage may result. Give a slack to the cable while wiring.
- The LF1D-E illumination unit is a general-purpose and industrial electronic device. Do not use the LF1D-E illumination unit for electronic equipment which may damage a human body or threaten a life in case a malfunction or failure occurs.
- Make sure that the cable does not touch the LF1D-E housing.

#### CAUTION

- LED modules and illumination units may vary in illumination colors and illuminance.
- Apply a voltage within the rated value, otherwise the LED elements may be damaged.
- The LF1D-E illumination unit is vulnerable to static electricity. Take a sufficient measure for protection against static electricity and surge voltages.
- Do not apply an excessive force to the LF1D-E illumination unit. Do not leave a damaged LF1D-E illumination unit unattended or use a damaged LF1D-E.
- Make sure of the correct operating temperature, which is the temperature around the LF1D-E illumination unit. Otherwise internal temperature rise may result in damage.
- Do not use or store the LF1D-E illumination unit in a place subjected to vibrations and shocks.
- Do not use the LF1D-E illumination unit in the following places:  
Exposed to direct sunlight, near heaters, and at high temperatures  
Subjected to chemicals, and corrosive gases  
(Plastic lens types: Iron powder and oil)  
Basements, greenhouses, and other humid places  
Cold storage warehouses and cooler exhaust outlets  
(make sure that no freezing occurs)
- Do not loosen screws, otherwise the protection characteristics will be impaired.

### 1 Types

Lens Material	Type No.
Reinforced Glass	LF1D-E□F-2W-◇
Plastic	LF1D-E□G-2W-◇

□ : Lens surface code ◇ : Accessory code

### Accessories

Cable Gland	LF9Z-A11
Mounting Bracket	LF9Z-B11
Cable (5m)	LF9Z-C05

### 2 Specifications

#### General Specifications

Applicable Standard	JIS C 8105-1 EN61000-6-2
Rated Voltage	24V DC (Operating voltage range: 21.6V to 26.4V DC)
Input Current (approx.)	375 mA typ. (450 mA maximum)
Rated Power (approx.)	9W typ. (11W maximum)
Operating Temperature	-30 to +55°C (no freezing)
Storage Temperature	-35 to +70°C (no freezing)
Operating Humidity	45 to 85% RH (no condensation)
Storage Humidity	20 to 90% RH (no condensation)
Life *1	50,000 hours minimum (until the brightness reduces to 70% the initial value in 25°C environment)
Insulation Resistance	1 MΩ minimum (500V DC megger)
Dielectric Strength	1000V AC, 1 minute (between input terminal and ground terminal or housing)
Vibration Resistance (damage limits)	5 to 55Hz, amplitude 0.5 mm
Shock Resistance (damage limits)	1000 m/s <sup>2</sup>
Material	Front Cover: SUS304 Housing: Diecast aluminium Lens *2 : Reinforced Glass Polycarbonate Acryl Cable Gland: Brass Mounting Bracket: SUS304 Cable: PVC
Weight (approx.)	750g (no accessories) 950g (with cable gland, mounting bracket, cable)
Degree of Protection	LF1D-E □ F-2W-◇ : IP67† *3 LF1D-E □ G-2W-◇ : IP67

\*1: Note that the life of the LED is greatly affected by the operating conditions.

\*2: Lens material is specified by the Type No.

\*3: Water- and oil-tight characteristics are tested to IEC60529 requirements and do not assure protection against all actual operating conditions.

#### LED Optical Specifications

Illumination Color	White
Total Luminous Flux (typ.)	600 lm
Color Temperature (typ.)	5700K
Reference Illuminance (typ.) at 1.0m (perpendicular)	1000 lx

### 3 Installation

#### Mounting Centers (see Demensions)

- Direct Mount**  
Mount the LF1D-E illumination unit using four M4 screws. Tighten the screws to the torque shown below.  
Recommended tightening torque: 1.4 to 2.0 N·m
- Bracket Mount**  
Mount the LF1D-E illumination unit using four M5 screws. Tighten the screws to the torque shown below.  
Recommended tightening torque: 2.6 to 3.7 N·m

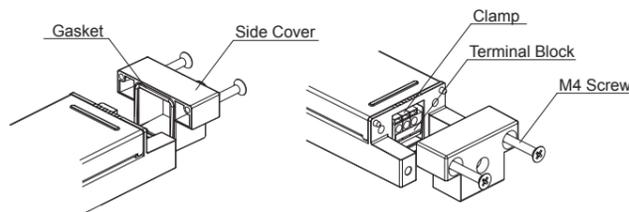
### 4 Wiring

#### Wiring

- Connect the ground (⊕) terminal of the LF1D-E LED illumination unit to a proper ground for protection against static electricity and surge voltages.
- The LF1D-E illumination unit is equipped with a cable, UL2464 AWG 24 x 3 cores. When wiring, use an appropriate connector, terminal, or wire to meet the specification values. When soldering the wires of the cable, use a 20W soldering iron, with a tip temperature of 350°C, and complete soldering within 3 seconds. Use Sn-Ag-Cu lead-free solder.
- Make sure that the cable does not touch the LF1D-E housing.

#### Cable Connection

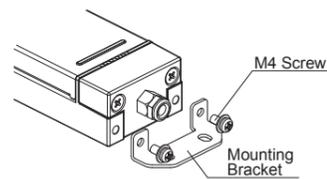
- When connecting a cable to the terminal block, remove the side cover. Before removing the side cover, wipe off water and oil from the housing, otherwise water or oil may enter the inside of the housing.
- When reinstalling the side cover, clean the gasket. Any foreign object on the gasket may impair the water-proof characteristics. Make sure that the cable is not caught between the housing and the side cover.
- To install the side cover, tighten the two M4 screws to the torque shown below.  
Recommended tightening torque: 1.4 to 2.0 N·m
- To remove the cable from the terminal block, push in the clamp and pull out the wire.



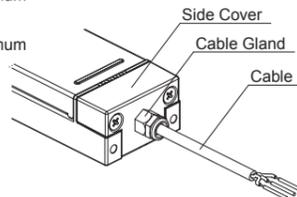
### 5 Accessories

When installing the optional mounting bracket, cable gland, and cable, follow the steps shown below.

- Install the two mounting brackets using the attached four M4 screws. Tighten the screws to the torque shown below.  
Recommended tightening torque: 1.4 to 2.0 N·m



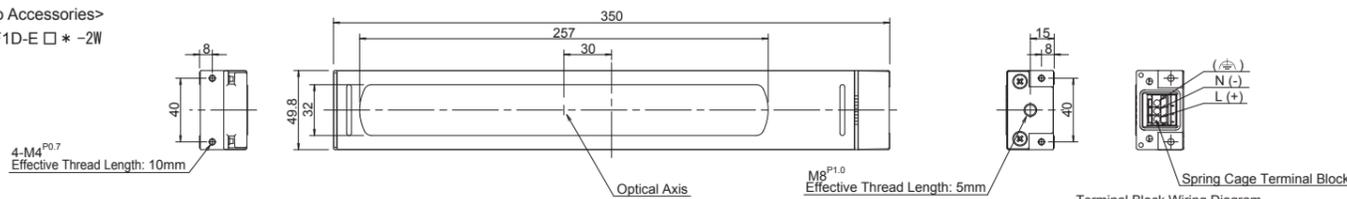
- Tighten the cable gland to the torque shown below. Installation into the side cover:  
Recommended tightening torque: 1.5 N·m minimum



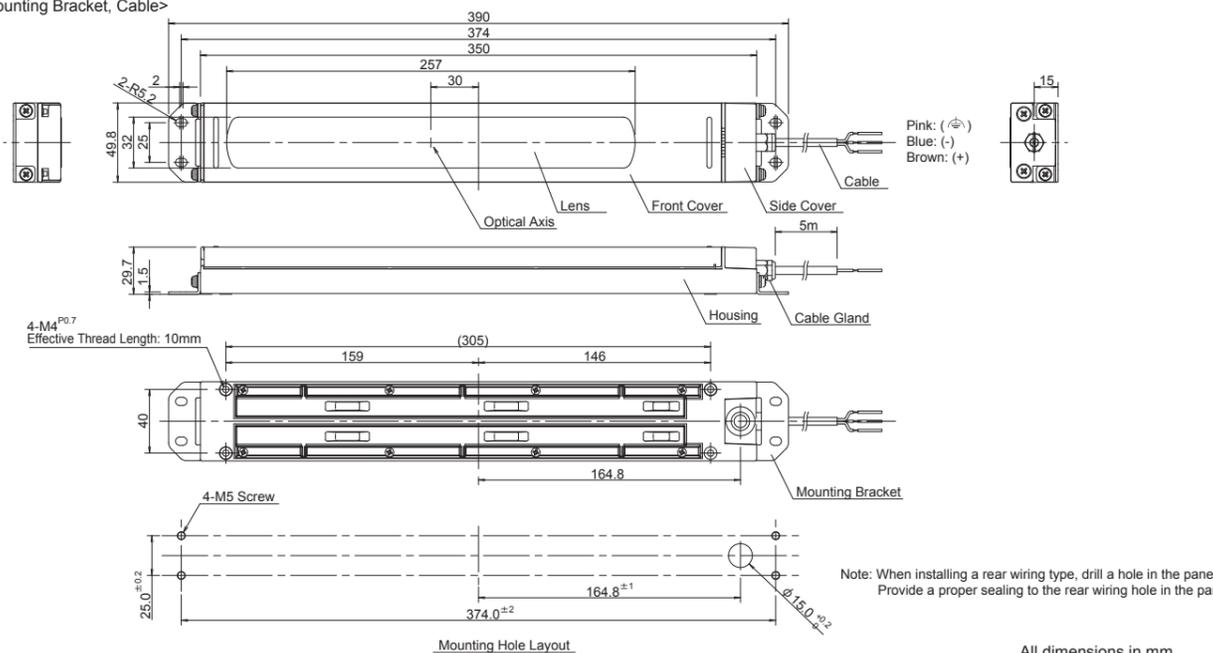
- For cable connection, see [4] "Wiring."

### 7 Dimensions

<No Accessories>  
LF1D-E □ \* -2W



<with Cable Gland, Mounting Bracket, Cable>  
LF1D-E □ \* -2W-A



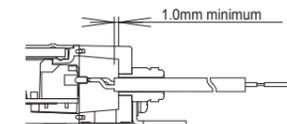
Note: When installing a rear wiring type, drill a hole in the panel. Provide a proper sealing to the rear wiring hole in the panel.

All dimensions in mm.

### 8 Precautions for Disposal

- Dispose of the LF1D-E LED Illumination Unit as an industrial waste.

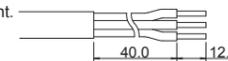
When installing a cable using the cable gland, make sure that the cable sheath protrudes the gland as shown at right, otherwise the water-proof characteristics may be impaired.



### 6 Recommended Parts

When using commercially available ferrules, cables, and cable glands, choose the recommended parts shown below.

- Ferrule: AI 0.25-12BU, AI 0.34-12TQ  
AI 0.5-12 WH, AI 0.75-12GY (Phoenix Contact)  
Applicable ferrule thickness: 0.25 to 0.75mm<sup>2</sup>
- Cable: RO-FLEX 1000T AWG24 x 3c (NICHIGOH)  
Strip the cable sheath and wire insulation as shown at right.



- Cable Gland: SKINDICHT MINI M8X1(LAPP)  
When using a cable gland shown above, choose a cable of φ 3.5 to 5.5 mm in order to assure IP67.  
Choose a cable gland in consideration of the thread size and effective thread length.