

## LF1D (IP67, IP67f, IP69K) & LF2D (IP67, IP67f) Series

### Key features:



LF1D and LF2D LED units are the brightest in their class. With their rugged construction they are ideal for machine tools, and food and beverage processing equipment. Available in wide or slim packages, with either Standard or High-Luminance (brighter, wider range) options. The design of these LED lights provides equally brilliant light at the center or edges of the units.

- Brightness: Standard Models: up to 1,100lx at 1m  
High-Luminance Models: up to 1,450lx at 1m
- Life: 70% of initial luminance at 50,000 Hrs
- Rugged & durable for harsh environments
- Stainless steel cover (LF1D models), diecast aluminum housing
- LF1D: IP67, IP67f, IP69K (high pressure and high temperature washdown)
- LF2D: IP67 (Polycarbonate lens) or IP67f (Reinforced glass lens)
- UL Listed (wet locations)
- RoHS Compliant



### Part Numbers

#### LF1D

Model			Slim Model (10 LEDs × 1 row)		Wide Model (7 LEDs × 2 rows)	
Cable Gland	Cable	Mounting Bracket	Clear Reinforced Glass	Clear Polycarbonate	Clear Reinforced Glass	Clear Polycarbonate
Appearance						
— (hole on the side)	—	√	LF1D-E@2F-2W LF1D-E@2F-2W-101	LF1D-E@3G-2W LF1D-E@3G-2W-101	LF1D-F@2F-2W LF1D-F@2F-2W-101	LF1D-F@3G-2W LF1D-F@3G-2W-101
— (hole on the back)	—	√	LF1D-E@2F-2W-200 LF1D-E@2F-2W-201	LF1D-E@3G-2W-200 LF1D-E@3G-2W-201	LF1D-F@2F-2W-200 LF1D-F@2F-2W-201	LF1D-F@3G-2W-200 LF1D-F@3G-2W-201
√ (Side)	—	√	LF1D-E@2F-2W-300 LF1D-E@2F-2W-301	LF1D-E@3G-2W-300 LF1D-E@3G-2W-301	LF1D-F@2F-2W-300 LF1D-F@2F-2W-301	LF1D-F@3G-2W-300 LF1D-F@3G-2W-301
	√	√	LF1D-E@2F-2W-350 LF1D-E@2F-2W-A	LF1D-E@3G-2W-350 LF1D-E@3G-2W-A	LF1D-F@2F-2W-350 LF1D-F@2F-2W-A	LF1D-F@3G-2W-350 LF1D-F@3G-2W-A
√ (Back)	—	√	LF1D-E@2F-2W-400 LF1D-E@2F-2W-401	LF1D-E@3G-2W-400 LF1D-E@3G-2W-401	LF1D-F@2F-2W-400 LF1D-F@2F-2W-401	LF1D-F@3G-2W-400 LF1D-F@3G-2W-401
	√	√	LF1D-E@2F-2W-450 LF1D-E@2F-2W-451	LF1D-E@3G-2W-450 LF1D-E@3G-2W-451	LF1D-F@2F-2W-450 LF1D-F@2F-2W-451	LF1D-F@3G-2W-450 LF1D-F@3G-2W-451

#### LF2D

Model			Slim Model (10 LEDs × 1 row)		Wide Model (7 LEDs × 2 rows)	
Cable Gland	Cable	Mounting Bracket	Clear Reinforced Glass	Clear Polycarbonate	Clear Reinforced Glass	Clear Polycarbonate
Appearance						
— (hole on the side)	—	—	LF2D-E@2F-2W	LF2D-E@3G-2W	LF2D-F@2F-2W	LF2D-F@3G-2W
— (hole on the back)	—	—	LF2D-E@2F-2W-200	LF2D-E@3G-2W-200	LF2D-F@2F-2W-200	LF2D-F@3G-2W-200
√ (Side)	—	—	LF2D-E@2F-2W-300	LF2D-E@3G-2W-300	LF2D-F@2F-2W-300	LF2D-F@3G-2W-300
	√	√	LF2D-E@2F-2W-A	LF2D-E@3G-2W-A	LF2D-F@2F-2W-A	LF2D-F@3G-2W-A
√ (Back)	—	—	LF2D-E@2F-2W-400	LF2D-E@3G-2W-400	LF2D-F@2F-2W-400	LF2D-F@3G-2W-400
	√	—	LF2D-E@2F-2W-450	LF2D-E@3G-2W-450	LF2D-F@2F-2W-450	LF2D-F@3G-2W-450

 In place of @ specify Standard (blank) or High-Luminance models (H).

**Part Number Structure** (use for interpreting part numbers only)

**LF 2 D - E H 2 F - 2 W - 300**

Shape  
1: Surface mount  
2: Recessed mount


Size (LED arrangement)  
E: Slim Model (10 LEDs × 1 row)  
F: Wide Model (7 LEDs × 2 rows)

Illumination Models  
blank: Standard  
H: large area, High Luminance

Illumination Surface  
2: Clear, Reinforced glass  
3: Clear, Polycarbonate  
5: Diffused, Polycarbonate  
9: Diffused, Reinforced glass




Cable Gland  
Degree of Protection  
F: IP67f (LF2D),  
IP67f/IP69K (LF1D)  
G: IP67 (LF2D),  
IP67/IP69K (LF1D)

Code	Cable Gland	Cable Gland Hole Location	Cable	Mounting Bracket
Blank	—	side	—	—
A	√	side	√	√*
101	—	side	—	√*
200	—	back	—	—
201	—	back	—	√*
300	√	side	—	—
301	√	side	—	√*
350**	√	side	√	—
400	√	back	—	—
401	√	back	—	√*
450	√	back	—	—
451	√	back	√	√*

 \*Mounting bracket available for LF1D only.  
\*\*Available for LF1D only.


**Specifications**

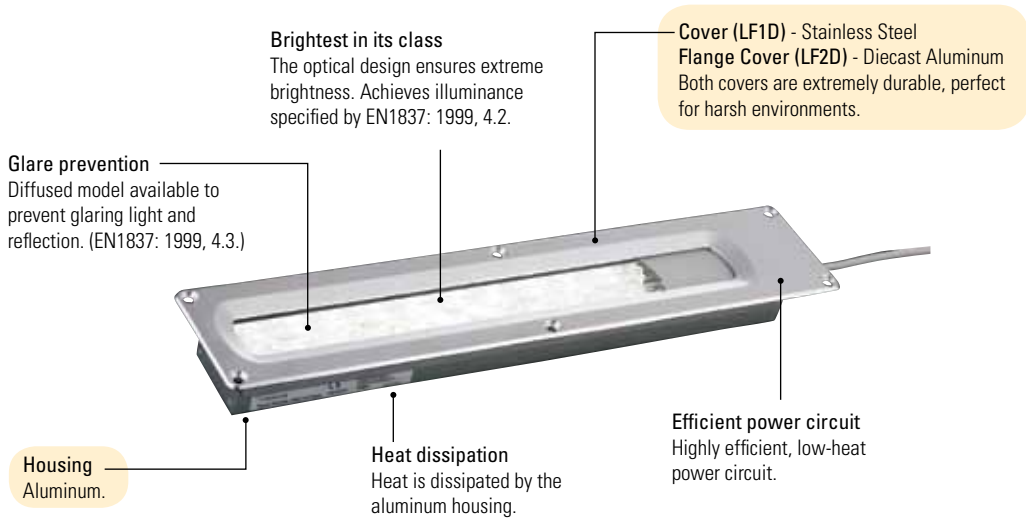
Model	Standard		High-Luminance	
	Slim	Wide	Slim	Wide
Rated Voltage	24V DC			
Voltage Range	21.6 to 26.4V DC			
Rated Power (typ.)	9W	12.5W	11W	12.5W
Insulation Resistance	1MΩ minimum (500V DC megger)			
Dielectric Strength	1,000V AC, 50/60Hz, 1 minute			
Vibration Resistance (damage limits)	Frequency 5 to 55Hz, amplitude 0.5mm			
Shock Resistance (damage limits)	1000m/s <sup>2</sup>			
Operating Temperature	-30 to +55°C (no freezing)			
Operating Humidity	45 to 85% RH (no condensation)			
Storage Temperature	-35 to +70°C (no freezing)			
Operating Environment	No corrosive gases			
Life <sup>1</sup>	50,000 hours (The illumination duration in which the illuminance maintains a minimum of 70% of the initial value at 25°C.)			
Degree of Protection <sup>2</sup>	IP67f (LF2D: reinforced glass), IP67 (LF2D: polycarbonate), IP67, IP69K (LF1D)			
Material <sup>3</sup>	Housing: Diecast aluminum (LF1D/LF2D) Lens: Reinforced glass or polycarbonate (LF1D/LF2D) Cover: Stainless steel (LF1D) Flange cover: Diecast aluminum (LF2D)			
Weight (approx.)	LF1D-E*-2W*: 750g LF1D-E*-2W-A*: 950g LF2D-E*-2W*: 850g LF2D-E*-2W-A*: 1,000g	LF1D-F*-2W*: 800g LF1D-F*-2W-*: 1,000g LF2D-F*-2W*: 900g LF2D-F*-2W-A*: 1,050g	LF1D-E*-2W*: 750g LF1D-E*-2W-A*: 950g LF2D-E*-2W*: 850g LF2D-E*-2W-A*: 1,000g	LF1D-F*-2W*: 800g LF1D-F*-2W-*: 1,000g LF2D-F*-2W*: 900g LF2D-F*-2W-A*: 1,050g

-  1. LED life depends on the operating environment.
-  2. Waterproof or oil-proof characteristics specified by IEC 60529 and JEM1030. For illumination units without accessories, use a cable gland and cables that satisfy IP67f or IP67 degree of protection.
-  3. The reinforced glass and polycarbonate illumination surfaces have the same appearance, but have different degrees of protection (IP67f or IP67).

**LED Optical Specifications**

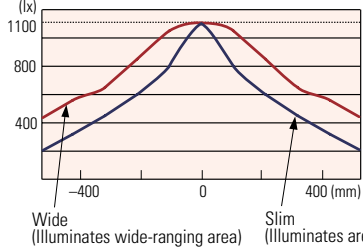
Model	Standard				High-luminance			
	Slim		Wide		Slim		Wide	
Illumination Surface	Clear	Diffused	Clear	Diffused	Clear	Diffused	Clear	Diffused
Illumination Color	Cool White							
Luminous Flux (Typ.)	600lm		840lm		1,000lm		1,260lm	
Color Temperature	5700K							
Reference Illuminance at 1.0m	1,100lx	1,000lx	1,100lx	1,000lx	1,450lx	1,200lx	1,450lx	1,200lx

 Note: LED modules and illumination units may vary in color and brilliance. Luminous flux, color temperature, and illuminance values shown above are typical.

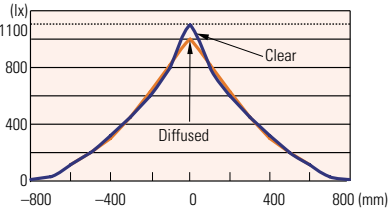


## Distribution Characteristics (reference value at 1.0m)

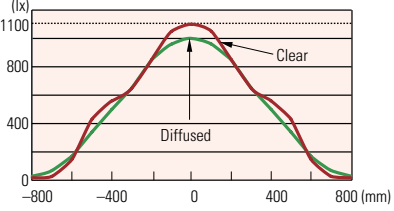
Standard Slim and Wide Models (Clear Surface)



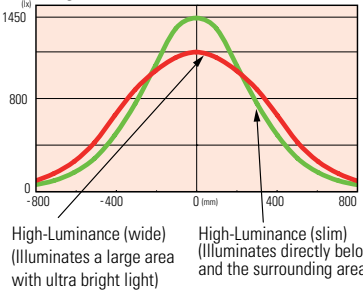
Standard Clear and Diffused Surface (Slim)



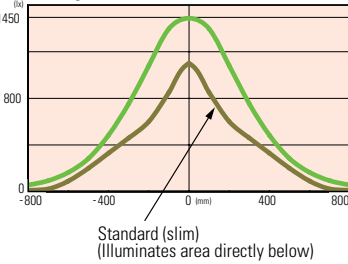
Standard Clear and Diffused Surface (Wide)



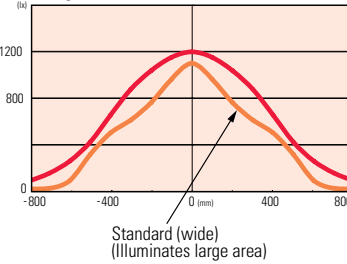
High-Luminance



High-Luminance & Standard

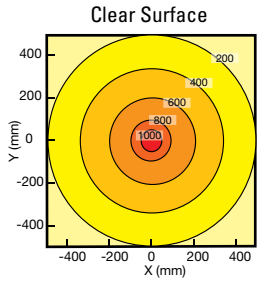


High-Luminance & Standard

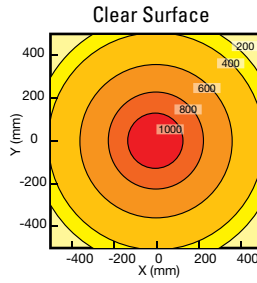
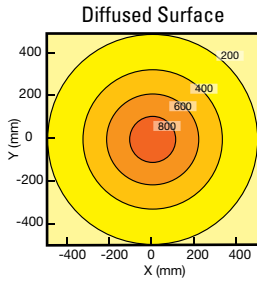


**Illuminance Charts**

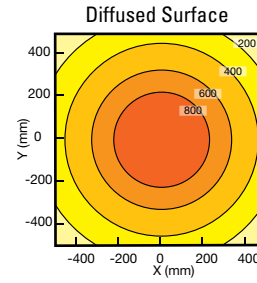
**Standard**



**Slim**

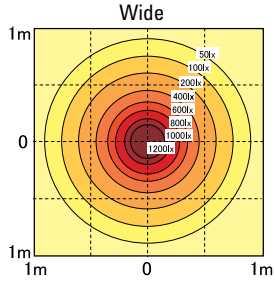
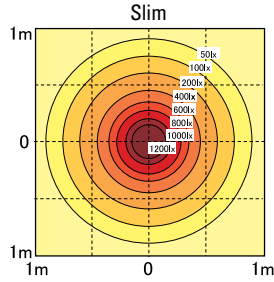


**Wide**



X: long side  
Y: short side

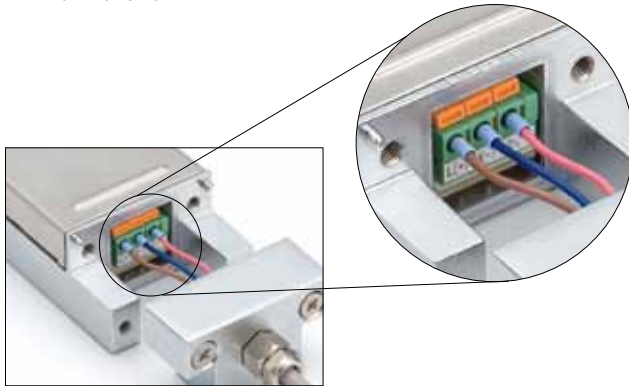
**High-Luminance**



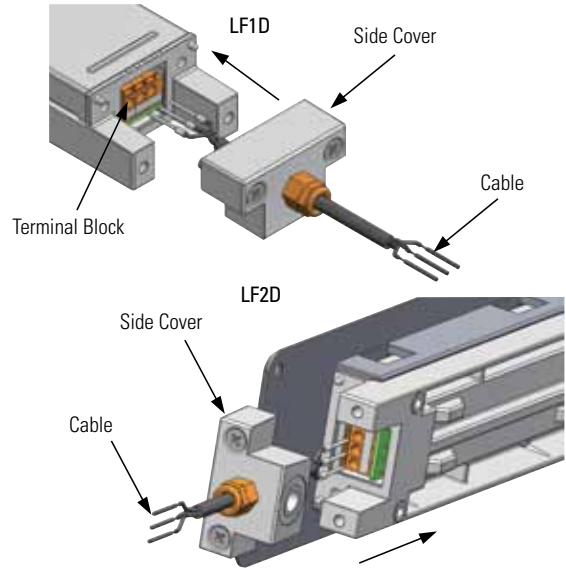
**Easy Maintenance**

**Spring-clamp Terminal Blocks**

Removable direct plug-in terminal blocks, with spring clamp connections, ensure a high-quality connection. This provides for easy installation or replacement of the LED illumination unit.

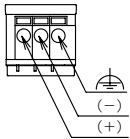


**Connection Example**

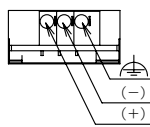


**Terminal Block Wiring**

**Slim Type**



**Wide Type**

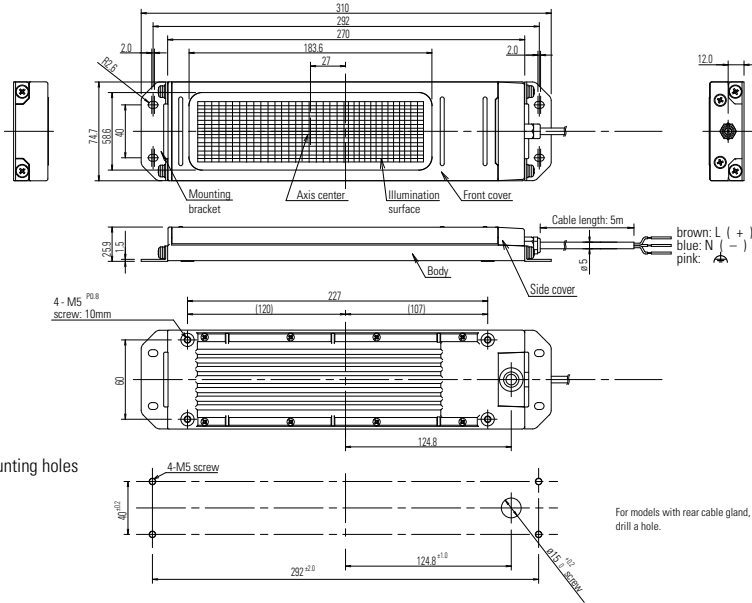


Applicable ferrules: 0.25 to 0.75 mm<sup>2</sup>

Recommended source - Phoenix Contact: AI 0,25-12 BU, AI 0,34-12 TQ, AI 0,5-12 WH, AI 0,75-12 GY

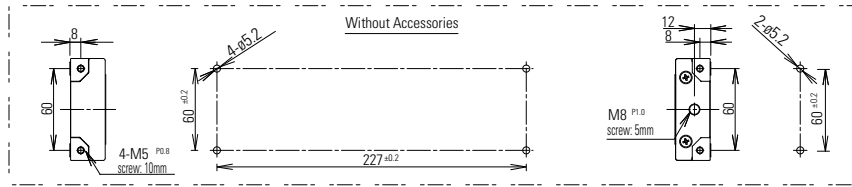


LF1D Wide

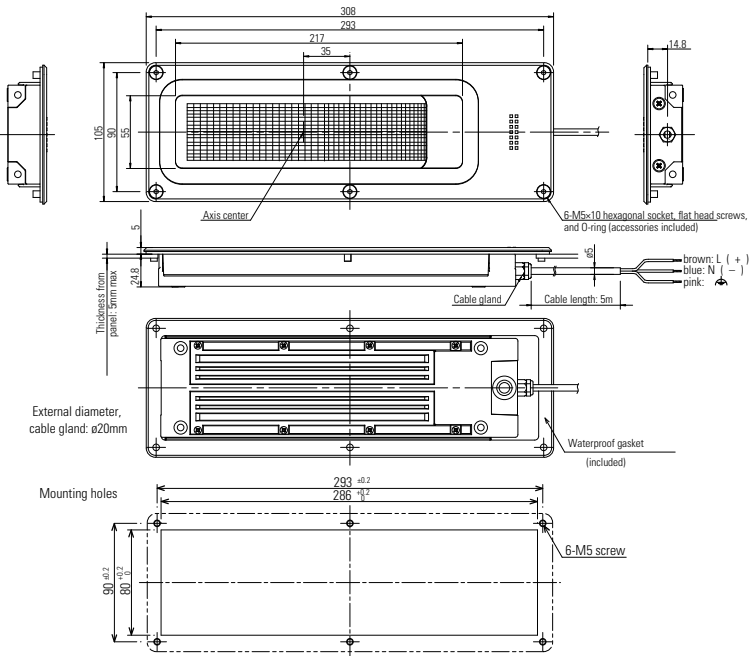


Mounting holes

For models with rear cable gland, drill a hole.



LF2D Wide

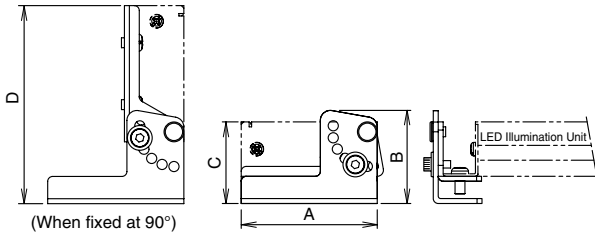


Accessories

Item	Mounting Bracket						Cable Gland	Cable
Part No.	LF9Z-1MB1	LF9Z-1MA1	LF9Z-B12	LF9Z-B11	LF9Z-1MDE1	LF9Z-1MDF1	LF9Z-A11	LF9Z-C05
Applicable Unit	LF1B-NA, -B, -C (-D not applicable)	LF1A-A, -B, -D	LF1D (Slim)		LF1D (Wide)		LF1E	LF1D
Material	Stainless Steel						Brass	PVC
Notes	1 pair Left and Right					1 piece	M8, applicable wire size (10-12 AWG)	Length: 5m

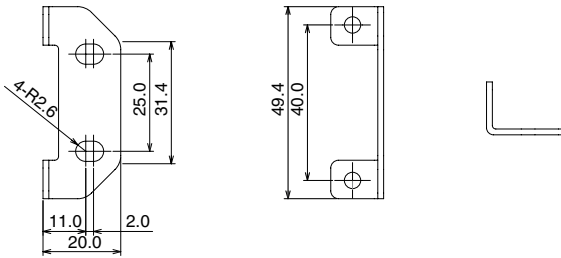
Dimensions (mm)

LF9Z-1MB1/1MA1

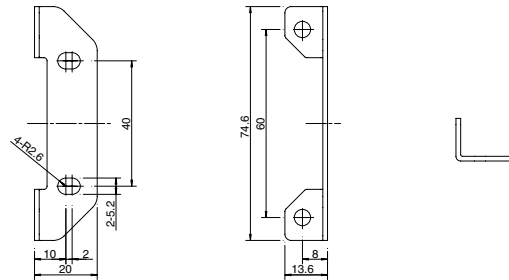


Part No.	A		B		C		D	
	mm	inch	mm	inch	mm	inch	mm	inch
LF9Z-1MB1	27.5	1.08	35.2	1.39	27	1.06	50.5	1.99
LF9Z-1MA1	55	2.17	37.9	1.49	33	1.30	80	3.15

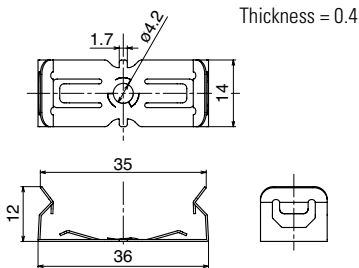
LF9Z-B11



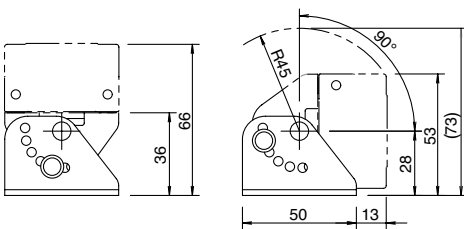
LF9Z-B12



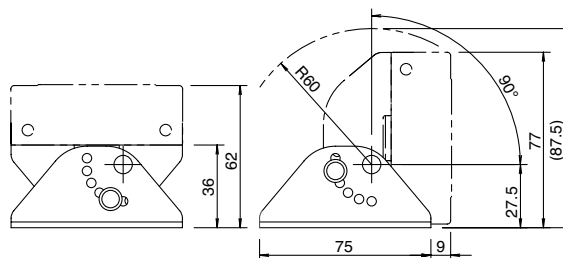
LF9Z-1SE1



LF9Z-1MDE1



LF9Z-1MDF1



**Safety Precautions**

- To avoid electric shock, fire, or malfunction do not disassemble, repair, or modify the unit.
- Turn power off before wiring. To prevent electric shock or damage, ensure wiring is correct.
- Do not stare directly into the LF1B-N unit while it is lit, and do not project the light towards other people, as their eyes may be injured.
- The LF1B-N is a general-purpose industrial electric device. Do not use with electronic equipment which may cause harm or injury to anyone in case a malfunction or failure occurs.
- Please adhere to the operating temperature specification. A rise in internal temperature may damage the product.

**Instructions**

- LED modules may vary slightly in color and brightness.
- Before designing equipment and powering up units, confirm the specifications described in the instruction sheet.
- Apply voltage within the rated values, otherwise the LED elements may be damaged.
- The unit is vulnerable to static electricity. Take sufficient measures for protection against static electricity and voltage surges.
- Make sure that the unit is not dropped during transportation, installation, and operation, otherwise damage may result.
- Do not pull or push the cable, otherwise damage may result. Allow sufficient slack to the cable while wiring.
- Do not apply excessive force. Do not leave a damaged unit unattended or use a damaged unit.
- Ensure the correct operating temperature, as rise in internal temperature may result in damage to the unit.
- Do not use or store in a location subject to vibration and shock.
- Do not use in the following locations:
  - Exposure to direct sunlight, near heaters, high temperatures
  - Subject to chemicals, and corrosive gases
  - Cold storage warehouses (make sure that no freezing occurs)
  - Places with high humidity such as basements and greenhouses
- Do not loosen screws, otherwise, the protection characteristics will be impaired.
- 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.
- The edge of the cable sheath is not waterproof. Moisture may be drawn in to the unit if water splashes directly onto the cable sheath.