Think Automation and beyond...

IDEC

LUMIFA™

LED Illumination Units

LF1D-C (mini)

LF1D-EH/FH
LF2D-EH/FH

LF1E
IP54

LF1D/LF2D IP67F IP67 IP69K

LF1D-H/LF1D-J (long)

EF1A
IP67

LF1B-N
IP65

LF1A
IP40

LF2B IP65

IDEC CORPORATION

Lineup	Shape		Application Examples	Illumination Color K: Color Temperature (typ.) mm: Dominant Wavelength (typ.)
Robust and resistant housing. Can be used in environments subject to water, dust, and oil. **LF1D** (Box) **LF2D** (Flange) Degree of Protection: IP67f/IP67/IP69K* ∗ LF1D only	Slim		The optimal light distribution can be achieved by combining the lenses of different distribution angle. · Machine tools · Food processing machines · Test equipment	White (5,700K)
	Wide			
Wide-angle and high-illuminance model. **LF1D-∗H** (Box) **LF2D-∗H** (Flange) Degree of Protection: IP67f/IP67/IP69K* ∗ LF1D only	Slim		· Machine tools · Food processing machines · Automatic manufacturing machines · Printing machines · Production system · Test equipment	White (5,700K)
	Wide			
LF1D-C (Mini) Degree of Protection: IP67f/IP67/IP69K			· Machine tools · Food processing machines · Automatic manufacturing machines · Printing machines · Production system · Test equipment	White (5,700K)
LF1D-H (long) Degree of Protection: IP67f/IP67/IP69K				Neutral White (4,700K)
LF1D-J (long) Degree of Protection: IP67f/IP67/IP69K				Neutral White (4,700K)

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Reference Illumination (typ.)	Size L × W × H mm	Illumination Surface	Rated Voltage	Power Consumption	Page
Clear Surface: 1,100 lx (directly below at 1.0m) (4,400 lx directly below at 50cm, calculation value) Diffused surface: 1,000 lx (directly below at 1.0m) (4,000 lx directly below at 50cm, calculation value)	· LF1D-E 350 × 49.8 × 29.8 · LF2D-E 389 × 80 × 33.7 · LF1D-F 270 × 74.7 × 25.9 · LF2D-F 308 × 105 × 29.8	Reinforced glass (Note 1) (clear/diffused) Polycarbonate (Note 2) (clear/diffused)	24V DC	Slim: 9W Wide: 12.5W	6
Slim: 1,450 lx (directly below at 1.0m) Wide: 1,200 lx (directly below at 1.0m)	· LF1D-EH 350 × 49.8 × 29.8 · LF2D-EH 389 × 80 × 33.7 · LF1D-FH 270 × 74.7 × 25.9 · LF2D-FH 308 × 105 × 29.7	Reinforced glass (Note 1) Polycarbonate (Note 2)	24V DC	Slim: 11W Wide: 12.5W	10
180 lx (directly below at 1.0m)	100 × 50 × 25	Reinforced glass	24V DC	4.6W	10
560 lx (directly below at 1.0m)	365 × 84 × 24.8	Reinforced glass	24V DC	18.4W	10
840 lx (directly below at 1.0m)	510 × 84 × 24.8	Reinforced glass	24V DC	27.6W	10

Note 1: Reinforced glass is resistant against oil.
Note 2: Polycarbonate is suitable for food processing machine.

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LED Illumination Unit Selection

Lineup	Shape	Application Examples	Illumination Color K: Color Temperature (typ.) mm: Dominant Wavelength (typ.)
Universal input (100 to 240VAC) and 12/24V DC. Compact and slim design. **LF2B** Degree of Protection: **IP65**		· Various machines and systems · Control panel · Plant · Solar power equipment	White (5,500K)
Thin and slim styles fit into compact spaces. IP65 (waterproof, dustproof). 6 different lengths and 6 distinct colors. **LF1B-N** Degree of Protection: **IP65**		· Machine tool · Plant equipment · Test equipment · Control panel	White (5,500K)
		· Food processing machines · Cosmetic plant · Chemical plant · Show cases	Warm white (2,900K)
		· Semiconductor manufacturing equipment · IC foundry	Yellow (590nm)
		· Photosensitive material · Semiconductor manufacturing equipment · Darkroom experiment	Red (620nm)
		· Advertising Display · Light ornaments	Blue (455nm)
			Green (525nm)
LED module and highly efficient heat dissipation technology achieved slim design. **LF1A** Degree of Protection: IP40		· Control panel · Plant equipment · Machine tool · Test equipment	White (5,500K)
		· Food processing machine · Cosmetic plant · Chemical plant	Warm white (2,800K)
		· Semiconductor manufacturing equipment · IC foundry	Yellow (590nm)
		· Semiconductor manufacturing equipment · Photographic laboratory · Darkroom experiment	Red (625nm)
Resistant against dust and water. No-lens, condensing lens, and dual lens available. **LF1E** Degree of Protection: **IP54**		Freezer and refrigerated display case	White (5,000K)
			Warm white (3,000K)
Can be used in hazardous area of Zone 1 and 2. **EF1A** Degree of Protection: **IP67**		· Product Inspection · Printing factory · Gas station · Chemical complex control panel	White (5,700K)

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(13/02/15)

| Reference Illumination (typ.)		Size L × W × H mm	Illumination Surface	Rated Voltage	Power Consumption	Page
Clear Cover	· LF2B-B: 230 lx · LF2B-C: 425 lx · LF2B-D: 710 lx · LF2B-E: 930 lx · LF2B-F: 1,160 lx	· LF2B-B 210 × 40 × 29 · LF2B-C 330 × 40 × 29 · LF2B-D 580 × 40 × 29 · LF2B-E 830 × 40 × 29 · LF2B-F 1,080 × 40 × 29	Polycarbonate	12/24V DC	12/24V DC LF2B-B: 2.6W LF2B-C: 4.9W LF2B-D: 10.6W 100 to 240V AC LF2B-B: 3.8W LF2B-C: 7.5W LF2B-D: 9.2W LF2B-E: 14.3W LF2B-F: 21.8W	16
White Cover	· LF2B-B: 215 lx · LF2B-C: 390 lx · LF2B-D: 645 lx · LF2B-E: 835 lx · LF2B-F: 1,040 lx			100 to 240V AC		

Clear cover	LF1B-NA: 90 lx
	LF1B-NF: 935 lx
	(directly below at 50cm)
		·LF1B-NA
		  134 × 27.5 × 16
		·LF1B-NB
		  210 × 27.5 × 16
		·LF1B-NC
		  330 × 27.5 × 16
		·LF1B-ND
		  580 × 27.5 × 16
		·LF1B-NE
		  830 × 27.5 × 16
		·LF1B-NF
		  1,080 × 27.5 × 16
			Clear cover (polycarbonate)
			
			White cover (polycarbonate)
				24V DC	White·Warm white ·Blue
					  LF1B-NA: 1.5W
					  LF1B-NB: 2.9W
					  LF1B-NC: 4.4W
					  LF1B-ND: 8.7W
					  LF1B-NE: 13.0W
					  LF1B-NF: 17.3W
					Yellow·Red·Green
					  LF1B-NA: 1.0W
					  LF1B-NB: 2.0W
					  LF1B-NC: 2.9W
					  LF1B-ND: 5.8W
					  LF1B-NE: 8.7W
					  LF1B-NF: 11.6W
						18

	LF1B-NA: 60 lx LF1B-NF: 620 lx (directly below at 50cm)					
	LF1B-NA: 20 lx LF1B-NF: 180 lx (directly below at 50cm)					
	LF1B-NA: 10 lx LF1B-NF: 80 lx (directly below at 50cm)					
	LF1B-NA: 30 lx LF1B-NF: 300 lx (directly below at 50cm)					

Clear cover	LF1A-A1: 190 lx
	LF1A-B1: 380 lx
	LF1A-D1: 760 lx
	(directly below at 50cm)
		· LF1A-A1
		  120 × 55 × 22
		· LF1A-B1
		  180 × 55 × 22
		· LF1A-D1
		  300 × 55 × 22
			Clear PMMA	24V DC	White·Warm White
					LF1A-A1: 1.8W
					LF1A-B1: 3.6W
					LF1A-D1: 7.2W
						20

	LF1A-A1: 130 lx LF1A-B1: 260 lx LF1A-D1: 520 lx (directly below at 50cm)				Yellow·Red LF1A-A1: 2.2W LF1A-B1: 4.4W LF1A-D1: 8.7W	
	LF1A-A1: 85 lx LF1A-B1: 170 lx LF1A-D1: 340 lx					
Condensing Lens	White LF1E-A: 1,800 lx LF1E-B: 1,950 lx LF1E-C: 2,000 lx LF1E-D: 2,000 lx LF1E-E: 2,000 lx (directly below at 30cm)	LF1E-A: 292 × 36 × 18.8 LF1E-B: 550 × 36 × 18.8 LF1E-C: 808 × 36 × 18.8 LF1E-D: 1,066 × 36 × 18.8 LF1E-E: 1,450 × 36 × 18.8	Clear cover (polycarbonate)	24V DC	LF1E-A: 4.2W LF1E-B: 8.4W LF1E-C: 12.6W LF1E-D: 16.8W LF1E-E: 22.8W	22

	Clear glass surface:
	  1,100 lx (condensing light)
	  205 lx (diffused light)
	Translucent glass:
	  450 lx (condensing light)
	  175 lx (diffused light)
		· Direct mounting
		  277 × 104 × 82
		· With angle adjustable mounting bracket
		  310.2 × 117.4 × 126.7
		· With mounting bracket
		  310.2 × 104.0 × 99.4
			Reinforced glass	100 to 240V AC	19W	25

				24V DC	16W	

Note 1: Reinforced glass is resistant against oil.
Note 2: Polycarbonate is suitable for food processing machine.

LUMIFA™
LF1D/LF2D LED Illumination Units

Brightest in its class, excellent power savings. Optimal optical design achieves high brightness at both the center and periphery. IP67F degree of protection.

- LED provides energy-savings, long-life, space-saving and no-maintenance advantages.
- Illumination surface variety—reinforced glass or polycarbonate, both in clear or diffused type.
- IP67F degree of protection (polycarbonate: IP67)
- IP69K degree of protection (LF1D)
- Robust housing of aluminum diecast and stainless steel.
- Thin and slim profiles allow installation in space-limited areas.
- Even low profile is available with the sleek design of LF2D. Resistant to dust build up on the surface.
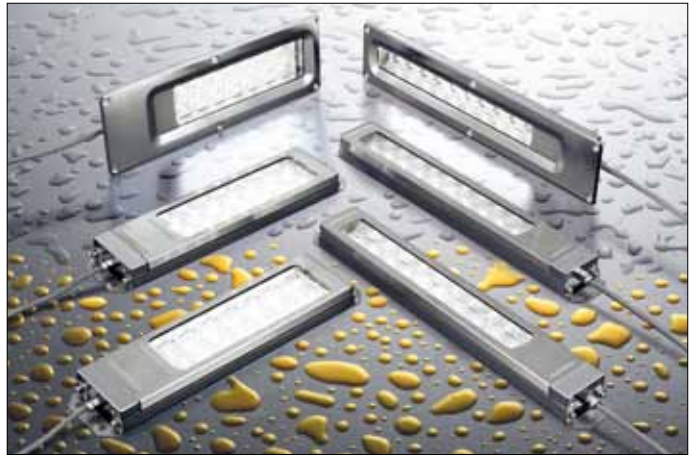
Application examples
Machine tools, food processing equipment, automatic manufacturing machines, printing machines, production system, test equipment, refrigeration and freezers.

LF1D (Illumination color: white)

Style			Slim (LF1D-E)		Wide (LF1D-F)	
Shape						
LED Arrangement			10 LEDs × 1 row		7 LEDs × 2 rows	
Optional Accessories			Illumination Surface		Illumination Surface	
Cable Gland LF9Z-A11	Cable LF9Z-C05	Mounting Bracket LF9Z-B11, -B12	Clear Reinforced Glass	Clear Polycarbonate	Clear Reinforced Glass	Clear Polycarbonate
Without (Cable gland hole on the side of LF1D)	—	—	LF1D-E2F-2W	LF1D-E3G-2W	LF1D-F2F-2W	LF1D-F3G-2W
		With	LF1D-E2F-2W-101	LF1D-E3G-2W-101	LF1D-F2F-2W-101	LF1D-F3G-2W-101
Without (Cable gland hole on the back of LF1D)	—	—	LF1D-E2F-2W-200	LF1D-E3G-2W-200	LF1D-F2F-2W-200	LF1D-F3G-2W-200
		With	LF1D-E2F-2W-201	LF1D-E3G-2W-201	LF1D-F2F-2W-201	LF1D-F3G-2W-201
With (Side)	—	—	LF1D-E2F-2W-300	LF1D-E3G-2W-300	LF1D-F2F-2W-300	LF1D-F3G-2W-300
		With	LF1D-E2F-2W-301	LF1D-E3G-2W-301	LF1D-F2F-2W-301	LF1D-F3G-2W-301
	With	—	LF1D-E2F-2W-350	LF1D-E3G-2W-350	LF1D-F2F-2W-350	LF1D-F3G-2W-350
		With	LF1D-E2F-2W-A	LF1D-E3G-2W-A	LF1D-F2F-2W-A	LF1D-F3G-2W-A
With (Back)	—	—	LF1D-E2F-2W-400	LF1D-E3G-2W-400	LF1D-F2F-2W-400	LF1D-F3G-2W-400
		With	LF1D-E2F-2W-401	LF1D-E3G-2W-401	LF1D-F2F-2W-401	LF1D-F3G-2W-401
	With	—	LF1D-E2F-2W-450	LF1D-E3G-2W-450	LF1D-F2F-2W-450	LF1D-F3G-2W-450
		With	LF1D-E2F-2W-451	LF1D-E3G-2W-451	LF1D-F2F-2W-451	LF1D-F3G-2W-451

- Contact IDEC for cable gland hole other than the standard M8 size. • Use Class 2 power supply when using the LF1D as UL/c-UL listed LED illumination unit.

LF2D (Illumination color: white)

Style		Slim (LF2D-E)		Wide (LF2D-F)	
Shape					
LED Arrangement		10 LEDs × 1 row		7 LEDs × 2 rows	
Optional Accessories		Illumination Surface		Illumination Surface	
Cable Gland LF9Z-A11	Cable LF9Z-C05	Clear Reinforced Glass	Clear Polycarbonate	Clear Reinforced Glass	Clear Polycarbonate
Without (cable gland hole on the side of LF2D)	—	LF2D-E2F-2W	LF2D-E3G-2W	LF2D-F2F-2W	LF2D-F3G-2W
Without (cable gland hole on the back of LF2D)	—	LF2D-E2F-2W-200	LF2D-E3G-2W-200	LF2D-F2F-2W-200	LF2D-F3G-2W-200
With (Side)	—	LF2D-E2F-2W-300	LF2D-E3G-2W-300	LF2D-F2F-2W-300	LF2D-F3G-2W-300
	With	LF2D-E2F-2W-A	LF2D-E3G-2W-A	LF2D-F2F-2W-A	LF2D-F3G-2W-A
With (Back)	—	LF2D-E2F-2W-400	LF2D-E3G-2W-400	LF2D-F2F-2W-400	LF2D-F3G-2W-400
	With	LF2D-E2F-2W-450	LF2D-E3G-2W-450	LF2D-F2F-2W-450	LF2D-F3G-2W-450

- Contact IDEC for cable gland hole other than the standard M8 size. • Use Class 2 power supply when using the LF2D as UL/c-UL listed LED illumination unit.

Accessories

Accessory		Material	Part No.	Remarks	Package Quantity
Cable Gland		Brass	**LF9Z-A11**	M8, applicable wire size: ø3.5 to 5.5 mm	1
Mounting Bracket	For LF1D-E (slim)	Stainless Steel	**LF9Z-B11**	With mounting screws	2 (for right and left)
	For LF1D-F (wide)		**LF9Z-B12**	With mounting screws	2 (one each for right and left)
Cable		PVC	**LF9Z-C05**	5m	1

- See page 24 for angle adjustable mounting bracket (LF1D). • Use Class 2 power supply when using the LF2D as UL/c-UL listed LED illumination unit.

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LF1D/LF2D LED Illumination Units

Part No. Development

1 Series (Legend)		2 Shape (Legend)		3 Style (LED arrangement) (Legend)		5 Degree of Protection (Legend)		6 Voltage (Legend)		7 Illumination Color (Legend)	
LF	Series name	1	Box	E	Slim (10 LEDs × 1 row)	F	IP67f	2	24V DC	W	White
		2	Flange	F	Wide (7 LEDs × 2 rows)	G	IP67				

4 Reinforced glass: F
Polycarbonate: G

1	2		3	4	5	6	7		8
LF	**2**	**D** –	**E**	**2**	**F** –	**2**	**W**	–	**A**
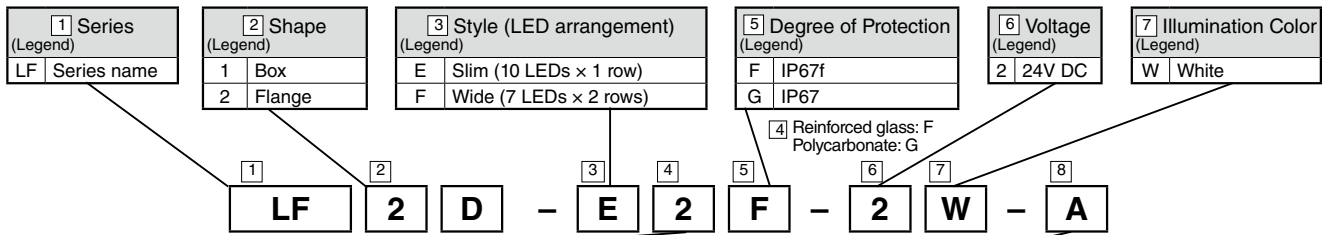
4 Illumination Surface (Legend)		
2	Clear	Reinforced glass
3		Polycarbonate
5	Diffused	Polycarbonate
9		Reinforced glass

8 Cable Gland (LF9Z-A11) (Legend)		8 Cable (LF9Z-C05) (Legend)		8 Mounting Bracket (LF9Z-B11, LF9Z-B12) (Legend)	
Blank	Without accessories. Cable gland hole on the side.				
A	With cable gland (standard). With cable. With mounting bracket (LF1D only)				
1	Without cable gland. Cable gland hole on the side.	0	Without	0	Without
2	Without cable gland. Cable gland hole in the back.				
3	With cable gland (standard) on the side.	0	Without	1	Yes
4	With cable gland (standard) in the back.	5	Yes		

- LF1D/LF2D: "100" and "351" are not available.
- LF2D: "350" and "∗∗1" (with mounting bracket) are not available.

Specifications

Model	LF1D		LF2D	
Style	Slim	Wide	Slim	Wide
Rated Voltage	24V DC			
Voltage Range	21.6 to 26.4V DC			
Rated Power (typ.) (at rated voltage)	9W	12.5W	9W	12.5W
Insulation Resistance	1MΩ minimum (500V DC megger)			
Dielectric Strength	1000V AC 50/60Hz, 1 minute			
Vibration Resistance (damage limits)	Frequency 5 to 55 Hz, amplitude 0.5 mm			
Shock Resistance (damage limits)	1000 m/s²			
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 Atmosphere	No corrosive gas			
Life (Note 1)	50,000 hours (The illumination duration in which the brightness maintains a minimum of 70% of the initial value at 25°C.)			
Degree of Protection (Note 2)	IP67F (reinforced glass), IP67 (polycarbonate)			
Material (Note 3)	Housing: Diecast aluminum Front cover: Stainless steel Illumination surface: Reinforced glass or polycarbonate		Housing and flange: Diecast aluminum Illumination surface: Reinforced glass or polycarbonate	
Weight (approx.)	LF1D-E∗∗-2W∗: 750g LF1D-E∗∗-2W-A∗: 950g	LF1D-F∗∗-2W∗: 800g LF1D-F∗∗-2W-∗:1000g	LF2D-E∗∗-2W∗: 850g LF2D-E∗∗-2W-A∗: 1000g	LF2D-F∗∗-2W∗: 900g LF2D-F∗∗-2W-A∗:1050g

Note 1: LED life depends on the operating environment.
Note 2: Waterproof or oil-proof characteristics specified by IEC 60529 and JEM1030.
For illumination units without accessories, use a cable gland and cable that satisfy IP67F or IP67 degree of protection.
Note 3: The reinforced glass and polycarbonate illumination surfaces have the same appearance, but have different degrees of protection (IP67F or IP67).
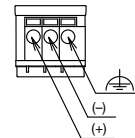
Terminal Block Wiring

Slim

Wide

Applicable ferrules: 0.25 to 0.75 mm²
Recommended source:
Phoenix Contact:
AI 0,25-12 BU, AI 0,34-12 TQ,
AI 0,5-12 WH, AI 0,75-12 GY

LED Optical Specifications

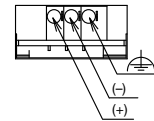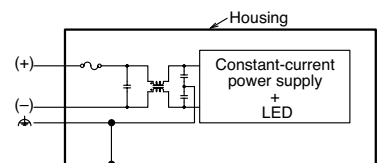| Model	LF1D				LF2D			
Style	Slim		Wide		Slim		Wide	
Illumination Surface	Clear	Diffused	Clear	Diffused	Clear	Diffused	Clear	Diffused
Illumination Color	White							
Color Temperature (typ.)	5700K							
Total Luminous Flux (typ.)	600 lm		840 lm		600 lm		840 lm	
Reference Illuminance (typ.) at 1.0m directly below	1100 lx	1000 lx	1100 lx	1000 lx	1100 lx	1000 lx	1100 lx	1000 lx

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

Internal Circuit

Illuminance Distribution (LF1D/LF2D) at 1.0m

X: long side
Y: short side

Slim

Clear surface

Diffused surface

Wide

Clear surface
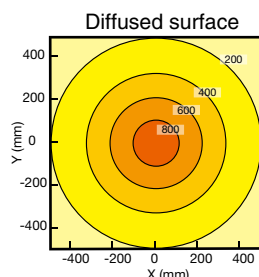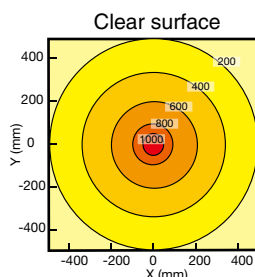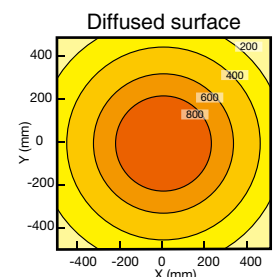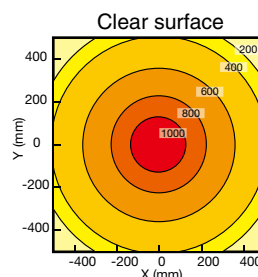
Diffused surface

LF1D/LF2D LED Illumination Units

Dimensions

LF1D-E (Slim, 10 LEDs × 1 row)

All dimensions in mm.

Mounting Hole Layout

Without cable gland, mounting bracket, and cable
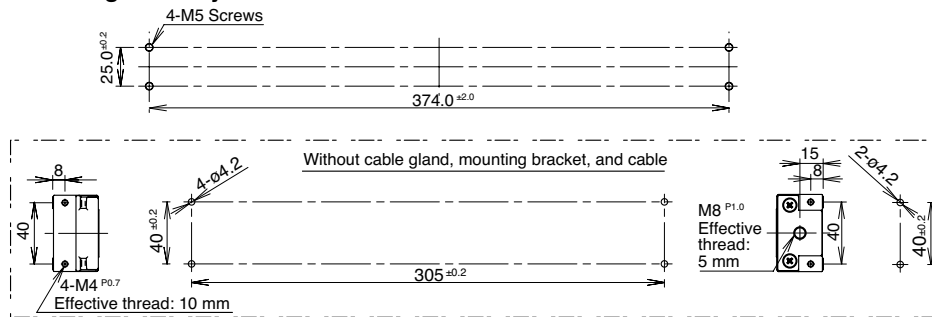
LF1D-F (Wide, 7 LEDs × 2 rows)

Mounting Hole Layout

Without cable gland, mounting bracket, and cable

IDEC

Dimensions

LF2D-E (Slim, 10 LEDs × 1 row)

All dimensions in mm.

389
374
310
37.5
80
65
30.6
15.7

Axis Center

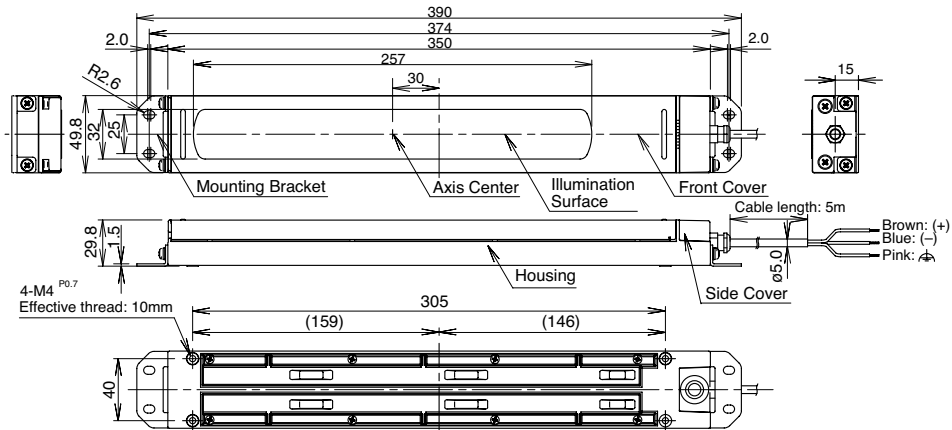6-M5×10 Hexagon Socket
Flat Head Screw
+ Gasket (supplied with LF2D)

5 max.
28.7

Panel thickness: 5 max.

Brown: (+)
Blue: (−)
Pink: ⏚

ø5.0

Cable length: 5m

Cable Gland

∗ External diameter of
cable gland is ø20mm

Waterproof Gasket
(supplied with LF2D)

Mounting Hole Layout

374 ±0.2
366 +0.2 0
65 ±2
55 +0.2 0

6-M5 Screws

LF2D-F (Wide, 7 LEDs × 2 rows)

308
293
217
35
105
90
55
14.8

Axis Center

6-M5×10 Hexagon Socket
Flat Head Screw
+ Gasket (supplied with LF2D)

5 max.
24.8

Panel thickness: 5 max.

Brown: (+)
Blue: (−)
Pink: ⏚

ø5.0

Cable length: 5m

Cable Gland

∗ External diameter of
cable gland is ø20mm

Waterproof Gasket
(supplied with LF2D)

Mounting Hole Layout

293 ±0.2
286 +0.2 0
90 ±0.2
80 +0.2 0

6-M5 Screws

LUMIFA™
LF1D/LF2D LED Illumination Units

Water, dust, oil-proof LED illumination units in slim and compact housings.
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 × 50 × 25 mm.
- No-multi shadow light illuminate the small surface scratches and irregularity of target objects, improving the processing accuracy. Wide 120º 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 120º distribution angle. High-power 2000/3000 lm luminous flux is suitable for replacing fluorescent light.

New

LF1D-C (mini)

LF1D-EH/FH
LF2D-EH/FH

New

LF1D-H/LF1D-J (long)

Application Examples

Machine tools, food processing equipment, automatic manufacturing machines, printing machines, production system, and test equipment.

c(UL)us LISTED   CE

LF1D-C (mini, illumination color: white)

Cable	Length	Part No.
With (side)	3m	**LF1D-C2F-2W-330**
	5m	**LF1D-C2F-2W-350**
With (back)	3m	**LF1D-C2F-2W-430**
	5m	**LF1D-C2F-2W-450**

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

Style			Slim (LF1D-EH)		Wide (LF1D-FH)	
Optional Accessories			Illumination Surface			
Cable Gland LF9Z-A11	Cable (5m) LF9Z-C05	Mounting Bracket LF9Z-B11, -B12	Reinforced Glass	Polycarbonate	Reinforced Glass	Polycarbonate
Without (cable gland hole on the side)	—	—	**LF1D-EH2F-2W**	**LF1D-EH3G-2W**	**LF1D-FH2F-2W**	**LF1D-FH3G-2W**
		With	**LF1D-EH2F-2W-101**	**LF1D-EH3G-2W-101**	**LF1D-FH2F-2W-101**	**LF1D-FH3G-2W-101**
Without (cable gland hole on the back)	—	—	**LF1D-EH2F-2W-200**	**LF1D-EH3G-2W-200**	**LF1D-FH2F-2W-200**	**LF1D-FH3G-2W-200**
		With	**LF1D-EH2F-2W-201**	**LF1D-EH3G-2W-201**	**LF1D-FH2F-2W-201**	**LF1D-FH3G-2W-201**
With (side)	—	—	**LF1D-EH2F-2W-300**	**LF1D-EH3G-2W-300**	**LF1D-FH2F-2W-300**	**LF1D-FH3G-2W-300**
		With	**LF1D-EH2F-2W-301**	**LF1D-EH3G-2W-301**	**LF1D-FH2F-2W-301**	**LF1D-FH3G-2W-301**
	With	—	**LF1D-EH2F-2W-350**	**LF1D-EH3G-2W-350**	**LF1D-FH2F-2W-350**	**LF1D-FH3G-2W-350**
		With	**LF1D-EH2F-2W-A**	**LF1D-EH3G-2W-A**	**LF1D-FH2F-2W-A**	**LF1D-FH3G-2W-A**
With (back)	—	—	**LF1D-EH2F-2W-400**	**LF1D-EH3G-2W-400**	**LF1D-FH2F-2W-400**	**LF1D-FH3G-2W-400**
		With	**LF1D-EH2F-2W-401**	**LF1D-EH3G-2W-401**	**LF1D-FH2F-2W-401**	**LF1D-FH3G-2W-401**
	With	—	**LF1D-EH2F-2W-450**	**LF1D-EH3G-2W-450**	**LF1D-FH2F-2W-450**	**LF1D-FH3G-2W-450**
		With	**LF1D-EH2F-2W-451**	**LF1D-EH3G-2W-451**	**LF1D-FH2F-2W-451**	**LF1D-FH3G-2W-451**

Package Quantity: 1

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

Style		Slim (LF2D-EH)		Wide (LF2D-FH)	
Optional Accessories		Illumination Surface			
Cable Gland LF9Z-A11	Cable (5m) LF9Z-C05	Reinforced Glass	Polycarbonate	Reinforced Glass	Polycarbonate
Without (cable gland hole on the side)	—	**LF2D-EH2F-2W**	**LF2D-EH3G-2W**	**LF2D-FH2F-2W**	**LF2D-FH3G-2W**
Without (cable gland hole on the back)	—	**LF2D-EH2F-2W-200**	**LF2D-EH3G-2W-200**	**LF2D-FH2F-2W-200**	**LF2D-FH3G-2W-200**
With (side)	—	**LF2D-EH2F-2W-300**	**LF2D-EH3G-2W-300**	**LF2D-FH2F-2W-300**	**LF2D-FH3G-2W-300**
	With	**LF2D-EH2F-2W-A**	**LF2D-EH3G-2W-A**	**LF2D-FH2F-2W-A**	**LF2D-FH3G-2W-A**
With (back)	—	**LF2D-EH2F-2W-400**	**LF2D-EH3G-2W-400**	**LF2D-FH2F-2W-400**	**LF2D-FH3G-2W-400**
	With	**LF2D-EH2F-2W-450**	**LF2D-EH3G-2W-450**	**LF2D-FH2F-2W-450**	**LF2D-FH3G-2W-450**

Package Quantity: 1

IDEC

LF1D-EH/FH, LF2D-EH/FH Accessories (slim/wide)

Accessory		Material	Part No.	Remarks	Package Quantity
Cable Gland		Brass	**LF9Z-A11**	M8, applicable wire size: 3.5 to 5.5	1
Mounting Bracket	LF1D-E/LF1D-EH (slim)	Stainless Steel	**LF9Z-B11**	With mounting screws	2 (for right and left)
	LF1D-F/LF1D-FH (wide)		**LF9Z-B12**		
Angle Adjustable Mounting Bracket	LF1D-E/LF1D-EH (slim)	Stainless Steel	**LF9Z-1MDE1**		
	LF1D-F/LF1D-FH (wide)		**LF9Z-1MDF1**		
Cable		PVC	**LF9Z-C05**	5 m	1

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

Cable	Length	Part No.
Side	5m	**LF1D-H2F-2N-350**
	1.5m + M12 connector	**LF1D-H2F-2N-3B0**
Back	5m	**LF1D-H2F-2N-450**
	1.5m + M12 connector	**LF1D-H2F-2N-4B0**

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

Cable	Length	Part No.
Side	5m	**LF1D-J2F-2N-350**
	1.5m + M12 connector	**LF1D-J2F-2N-3B0**
Back	5m	**LF1D-J2F-2N-450**
	1.5m + M12 connector	**LF1D-J2F-2N-4B0**

Part No. Development
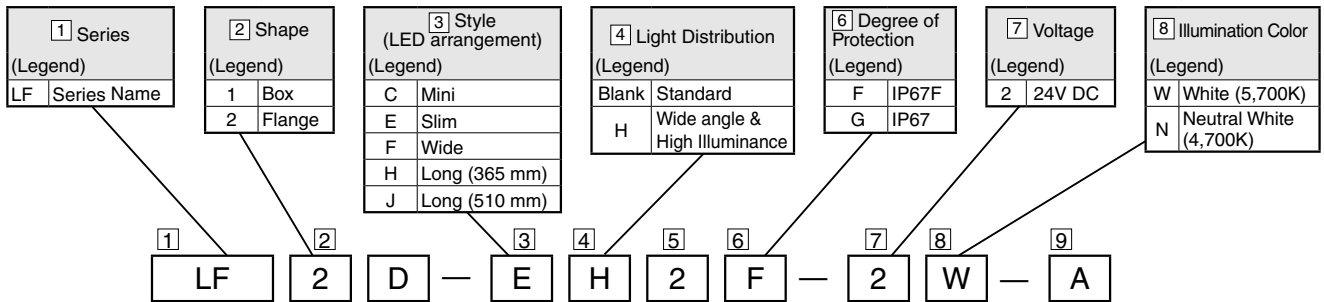
1 Series (Legend)		2 Shape (Legend)		3 Style (LED arrangement) (Legend)		4 Light Distribution (Legend)		6 Degree of Protection (Legend)		7 Voltage (Legend)		8 Illumination Color (Legend)	
LF	Series Name	1	Box	C	Mini	Blank	Standard	F	IP67F	2	24V DC	W	White (5,700K)
		2	Flange	E	Slim	H	Wide angle & High Illuminance	G	IP67			N	Neutral White (4,700K)
				F	Wide								
				H	Long (365 mm)								
				J	Long (510 mm)								

1	2	3	4	5	6	7	8	9
LF	2D	— E	H	2	F	— 2	W	— A

5 Illumination Surface (Legend)		
2	Clear	Reinforced glass
3		Polycarbonate
5	Diffused	Polycarbonate
9		Reinforced glass

Not all combinations of part no. codes are possible. For available part nos., contact IDEC.

9 Cable Gland (LF9Z-A11) (Legend)		9 Cable (LF9Z-C05) (Legend)		9 Mounting Bracket LF9Z-B11, LF9Z-B12 (Legend)	
Blank	Without accessories. Cable gland hole on the side.				
1	Without cable gland. Cable gland hole on the side.	0	Without	0	Without
2	Without cable gland. Cable gland hole on the back.			1	With
3	With cable gland (standard) on the side.	0	Without		
		3	3m cable		
4	With cable gland (standard) on the back.	5	5m cable		
		B	1.5m cable + M12 connector		
A	Slim/Wide: with cable gland, With 5m cable. With mounting bracket.				

Specifications

Model	LF1D-C	LF1D-E/LF2D-E	LF1D-EH/LF2D-EH	LF1D-F/LF2D-F	LF1D-FH/LF2D-FH	LF1D-H	LF1D-J
Style	Mini	Slim	Slim (wide angle & high illuminance)	Wide	Wide (wide angle & high illuminance)	Long (365 mm)	Long (510 mm)
Rated Voltage	24V DC						
Voltage Range	21.6 to 26.4V DC						
Rated Power (typ.) (at rated voltage)	4.6W	9W	11W	12.5W	12.5W	18.4W	27.6W
Insulation Resistance	100MΩ 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)	1,000 m/s²						
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 Atmosphere	No corrosive gas						
Life (Note 1)	50,000 hours (The illumination duration in which the brightness maintains a minimum of 70% of the initial value at 25°C.)						
Degree of Protection (Note 2)	IP67 (all models), IP67F (reinforced glass illumination surface), IP69K (LF1D)						
Material (Note 3)	Housing: aluminum Front cover: stainless steel Illumination surface: reinforced glass	Housing: diecast aluminum Front cover (LF1D): stainless steel Flange (LF2D): diecast aluminum Illumination surface: reinforced glass or polycarbonate				Housing: aluminum Front cover: stainless steel Illumination surface: reinforced glass	
Weight (approx.)	LF1D-C2F-2W-350: 420g	LF1D-E (H)**-2W-W: 950g LF2D-E (H)**-2W-A: 1,000g		LF1D-F (H)**-2W-A: 1,000g LF2D-F (H)**-2W-A: 1,050g		LF1D-H2F-2N-350: 1,200g	LF1D-J2F-2N-350: 1,600g

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.

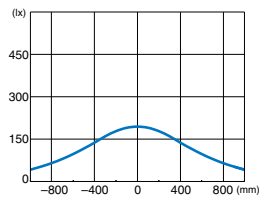# LUMIFA™ LF1D/LF2D LED Illumination Units

LED Optical Specifications

Model	LF1D-C	LF1D-E/LF2D-E	LF1D-EH/LF2D-EH	LF1D-F/LF2D-F	LF1D-FH/LF2D-FH	LF1D-H	LF1D-J
Style	Mini	Slim	Slim (wide angle & high illuminance)	Wide	Wide (wide angle & high illuminance)	Long (365 mm)	Long (510 mm)
Illumination Color	White					Neutral White	
Color Temp. (typ.)	5,700 K					4,700 K	
Luminus Flux (typ.)	560 lm	600 lm	1,000 lm	840 lm	1,260 lm	2,000 lm	3,000 lm
Reference Illuminance (typ.) at 1.0m directly below	180 lx	1,100 lx	1,450 lx	1,100 lx	1,200 lx	560 lx	840 lx

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

Light Distribution Characteristics at 1.0 m

LF1D-C

LF1D/2D-EH
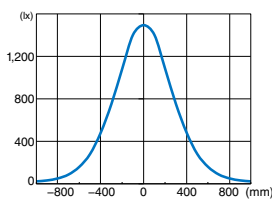
LF1D/2D-FH
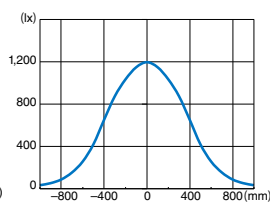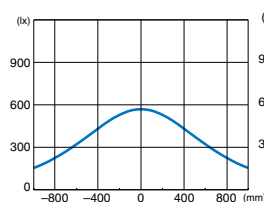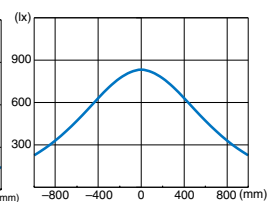
LF1D-H

LF1D-J

Light Distribution Curve

LF1D-C

LF1D/2D-EH

LF1D/2D-FH

LF1D-H

LF1D-J

A–A	
B–B	
C–C	
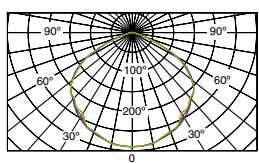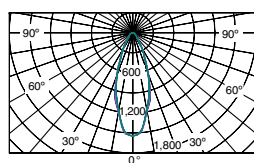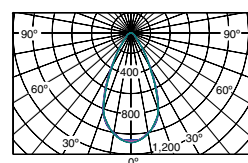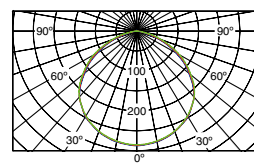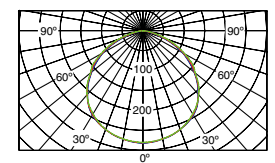
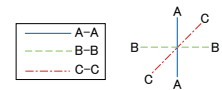## Internal Circuit

LF1D-C
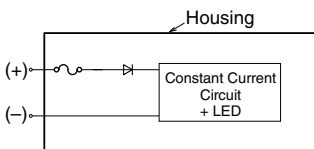
LF1D-E(H)/LF1D-F(H)
LF2D-E(H)/LF2D-F(H)
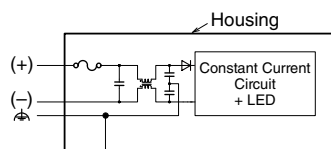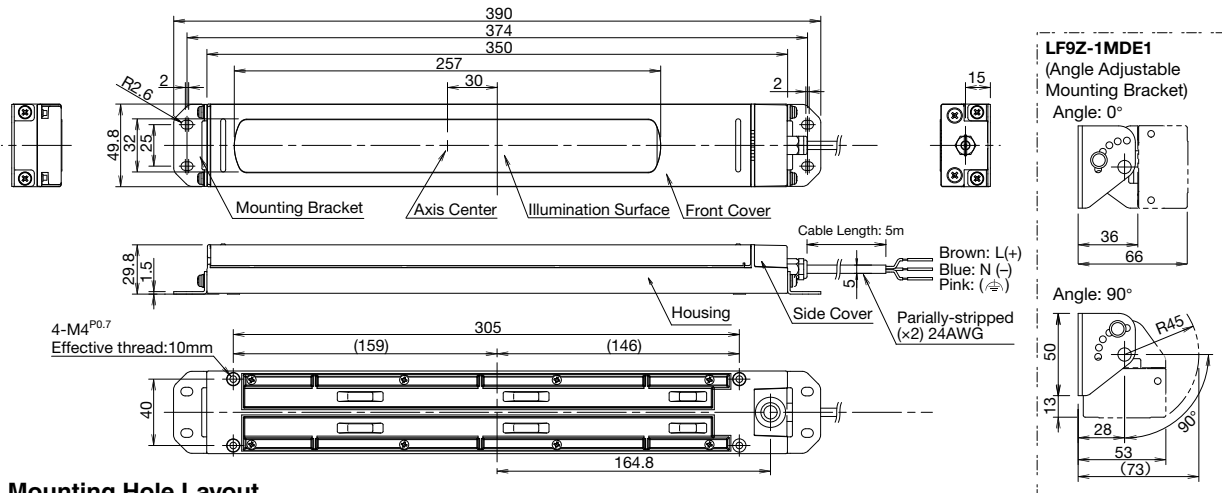
LF1D-H/LF1D-J
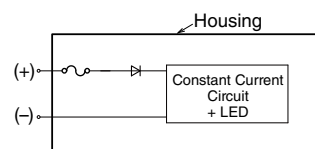
Dimensions

LF1D-C (Mini Model)

Illumination Surface
Front Cover
Cable
Cable Length
Housing

Brown: + 24V DC
Blue: –0V DC
Partially-stripped (×2)
24AWG

Note: 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.

Mounting Hole Layout

ø8 (Note)
2-M5 tapped hole or ø5.2 hole
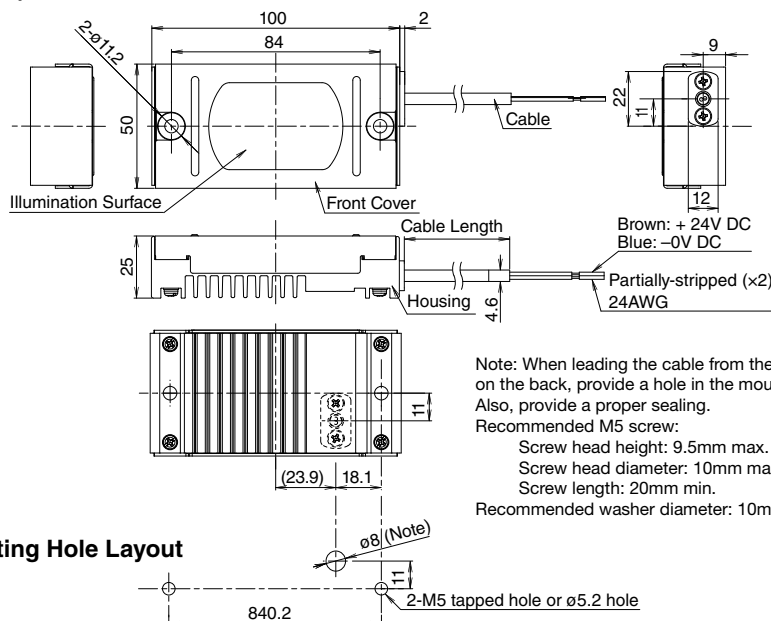
All dimensions in mm.

LF1D-E/EH (Slim Model/Box) (10 LEDs × 1 row)

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

Mounting Hole Layout

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$^{+2.0}_{-0.5}$ when the gasket diameter is larger than ø10 and ø12 or smaller.
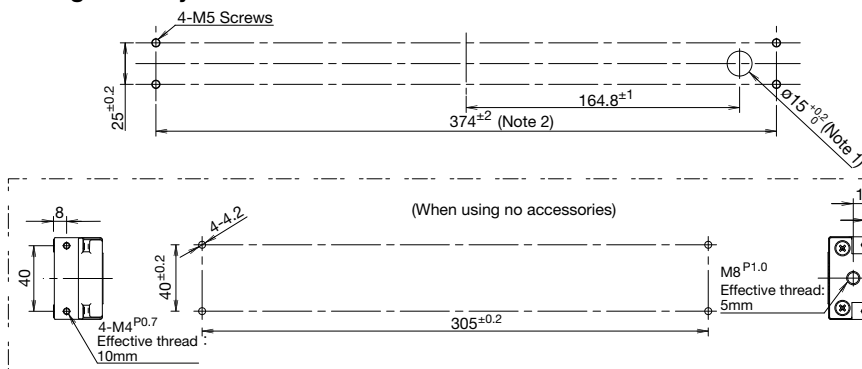
LF2D-E/EH (Slim Model/Flange) (10 LEDs × 1 row)

Note: External diameter of cable gland is ø20mm

Terminal Block Wiring

Applicable ferrules: 0.25 to 0.75mm²
Recommended source:
AI 0.25-12BU, AI 0.34-12TQ,
AI 0.5-12 WH, AI 0.75-12GY
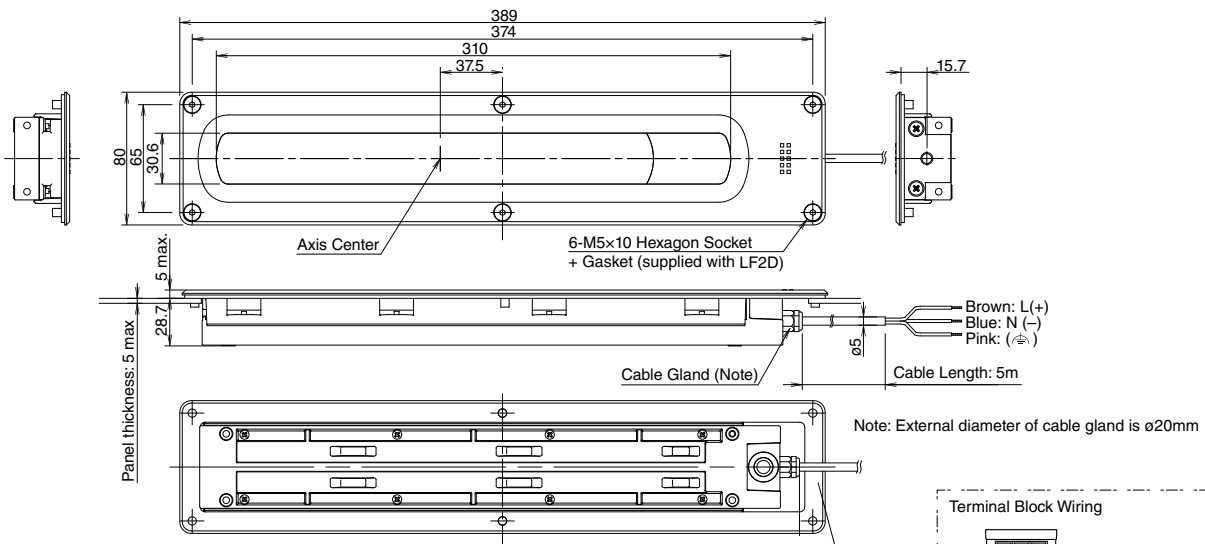
Mounting Hole Layout

All dimensions in mm.

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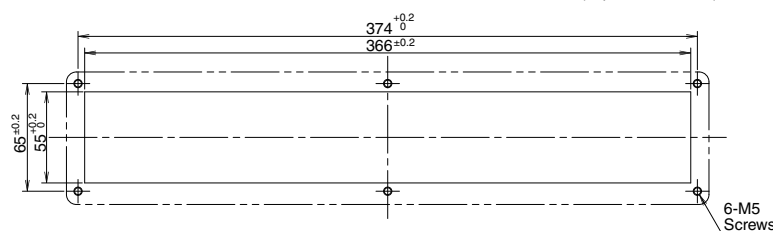
LF1D-F/FH (Wide Model/Box) (7 LEDs × 2 rows)

LF9Z-1MDE1
(Angle Adjustable Mounting Bracket)

Angle: 0°

Angle: 90°

Mounting Bracket / Axis Center / Illumination Surface / Front Cover

Cable Length: 5m
Brown: L(+)
Blue: N (−)
Pink: (⏚)

Housing

Side Cover

Parially-stripped (×2) 24AWG

4-M5 P0.8 Effective thread:10mm

4-M5 Screws

Mounting Hole Layout

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 $374^{+2.0}_{-0.5}$ when the gasket diameter is larger than ø10 and ø12 or smaller.

(When using no accessories)

4-M5 P0.8 Effective thread: 10mm

M8 P1.0 Effective thread: 5mm

LF2D-F/FH (Wide Model/Flange) (7 LEDs × 2 rows)
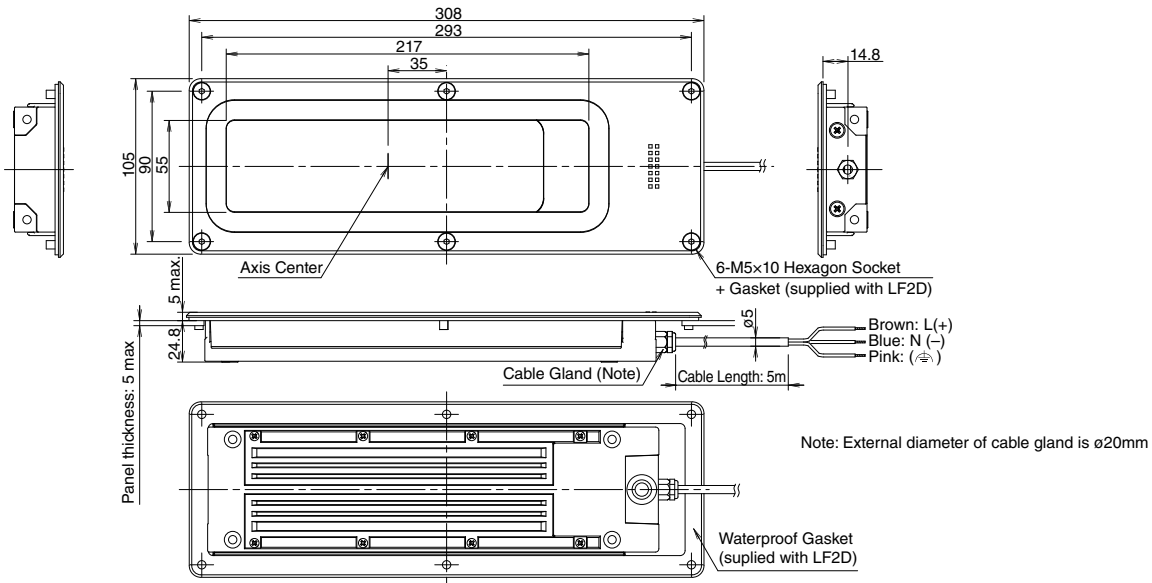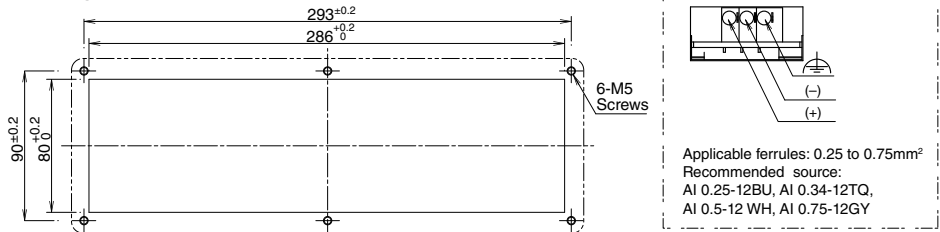
Axis Center

6-M5×10 Hexagon Socket + Gasket (supplied with LF2D)

Brown: L(+)
Blue: N (−)
Pink: (⏚)

Cable Gland (Note)
Cable Length: 5m

Note: External diameter of cable gland is ø20mm

Panel thickness: 5 max

Waterproof Gasket (suplied with LF2D)

Mounting Hole Layout

6-M5 Screws

Terminal Block Wiring

(−)
(+)

Applicable ferrules: 0.25 to 0.75mm²
Recommended source:
AI 0.25-12BU, AI 0.34-12TQ,
AI 0.5-12 WH, AI 0.75-12GY

All dimensions in mm.

LF1D-H (Long Model, 365 mm)

365
288
84
55
Illumination Surface
Front Cover
Brown: +24V DC
Blue: −0V DC
Partially-stripped (×2)
24AWG
12.7
Side Cover

24.8
A
A
Housing
12.5
Cable Length
(35)
ø4.6

Mounting Hole Layout

215
M5 P0.8
72
Cable
(25)

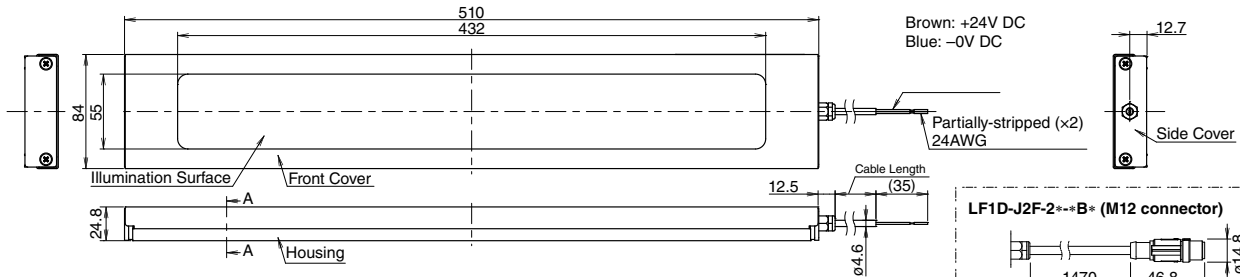**LF1D-H2F-2∗-∗B∗ (M12 connector)**

1470
46.8
ø14.8

M12 connector: SAC-4P-MS SCO/150/1.5

Pin Assignment

④ NC   ③ −0V DC
① +24V DC   ② NC

Use a connector that satisfies the required
degree of protection.
Recommended connector:
SAC-4P-1.5-PUR/FS SCO

215±0.2
6-ø5.5
72±0.2
ø8 (Note 1)
157.5±0.2

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-∗2F-2N-∗B∗ (M12 connector type).
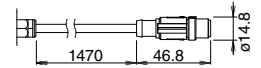Note 2: Choose mounting screws in consideration of mounting plate thickness.
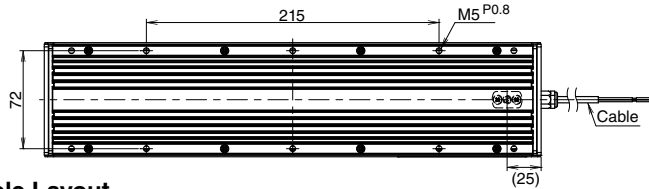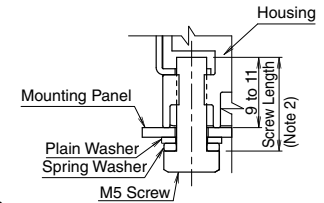
Housing
Mounting Panel
9 to 11
Screw Length (Note 2)
Plain Washer
Spring Washer
M5 Screw
A-A sec. (enlarged view)
(When M5 screw is installed)

LF1D-J (long model, 510 mm)

510
432
84
55
Illumination Surface
Front Cover
Brown: +24V DC
Blue: −0V DC
Partially-stripped (×2)
24AWG
12.7
Side Cover

24.8
A
A
Housing
12.5
Cable Length
(35)
ø4.6

Mounting Hole Layout

360
120
M5 P0.8
72
Cable
(25)

LF1D-J2F-2∗-∗B∗ (M12 connector)

1470
46.8
ø14.8

M12 connector: SAC-4P-MS SCO/150/1.5

Pin Assignment

④ NC   ③ −0V DC
① +24V DC   ② NC

Use a connector that satisfies the required
degree of protection.
Recommended connector:
SAC-4P-1.5-PUR/FS SCO

360±0.2
120±0.2
8-ø5.5
72±0.2
ø8 (Note 2)
230±0.2

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-∗2F-2N-∗B∗ (M12 connector type).
Note 2: Choose mounting screws in consideration of mounting plate thickness.
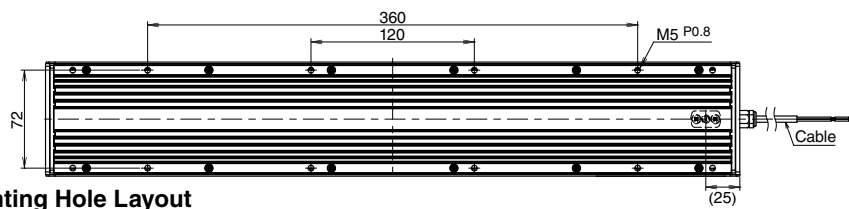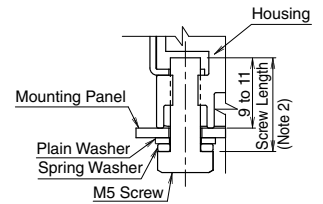
Housing
Mounting Panel
9 to 11
Screw Length (Note 2)
Plain Washer
Spring Washer
M5 Screw
A-A sec. (enlarged view)
(When M5 screw is installed)

All dimensions in mm.

LUMIFA™
# LF2B LED Illumination Units

Universal input (100 to 240V AC) and 12/24V DC input models are available.
Compact and slim design suitable for installing in various applications and also in narrow spaces. IP65 (waterproof, dustproof).

- Slim design (40mm wide, 29mm high). Can be installed in narrow spaces easily using mounting brackets.
- Five different lengths (210, 330, 580, 830, and 1,080 mm) available.
- Bright and clear white LED illuminates the target object clearly and brightly.
- Choice of two cover colors: clear and white.

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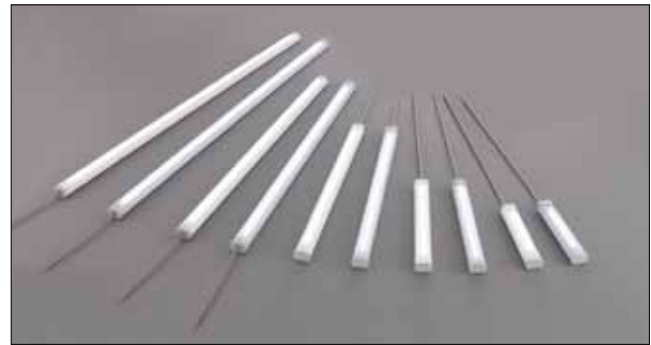
(12/24V DC model only)

Package quantity: 1

Illumination Color	White			
	Clear Cover		White Cover	
Shape				
Rated Voltage	100 to 240V AC	12/24V DC	100 to 240V AC	12/24V DC
LF2B-B (210mm)	LF2B-B3P-ATHWW2-1M	LF2B-B3P-BTHWW2-1M	LF2B-B4P-ATHWW2-1M	LF2B-B4P-BTHWW2-1M
LF2B-C (330mm)	LF2B-C3P-ATHWW2-1M	LF2B-C3P-BTHWW2-1M	LF2B-C4P-ATHWW2-1M	LF2B-C4P-BTHWW2-1M
LF2B-D (580mm)	LF2B-D3P-ATHWW2-1M	LF2B-D3P-BTHWW2-1M	LF2B-D4P-ATHWW2-1M	LF2B-D4P-BTHWW2-1M
LF2B-E (830mm)	LF2B-E3P-ATHWW2-1M		LF2B-E4P-ATHWW2-1M	
LF2B-F (1,080mm)	LF2B-F3P-ATHWW2-1M		LF2B-F4P-ATHWW2-1M	

- Use Class 2 power supply when using the LF2B as UL/c-UL listed LED illumination unit (12/24V DC only).

Part No. Development

LF2B-**C** **3** P-**A**THWW2-1M

Length
B: 210mm
C: 330mm
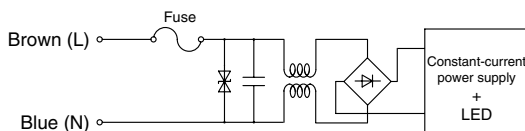D: 580mm
E: 830mm
F: 1,080mm

Cover
3: Clear
4: White

Rated Voltage
A: 100 to 240V AC
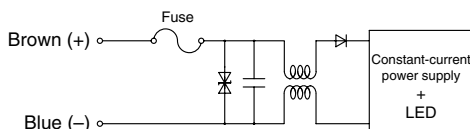B: 12/24V DC (210, 330, and 580mm lengths only)

Accessories

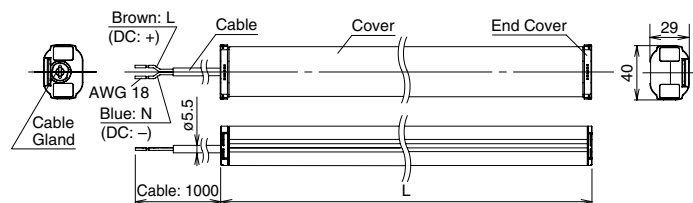| Model	Part No.	Package Quantity	Remarks
U-shaped Mounting Bracket	**LF9Z-1SB21PN10**	10	Supplied with the LF2B. LF2B-B, -C, and D: Two brackets are supplied. LF2B-E: Three brackets are supplied. LF2B-F: Four brackets are supplied.
L-shaped Mounting Bracket	**LF9Z-1SB22PN10**	10	Two brackets (for right and left) are required for alternate mounting of an LF2B.

Internal Circuit

100 to 240V AC

Brown (L) — Fuse — Constant-current power supply + LED
Blue (N)

12/24V DC

Brown (+) — Fuse — Constant-current power supply + LED
Blue (−)

Dimensions

Without mounting bracket

Brown: L (DC: +)
Cable   Cover   End Cover   29
AWG 18
Cable Gland   Blue: N (DC: −)   ø5.5   40
Cable: 1000   L

All dimensions in mm.

Part No.	L
LF2B-B∗P-∗THWW2-1M	210
LF2B-C∗P-∗THWW2-1M	330
LF2B-D∗P-∗THWW2-1M	580
LF2B-E∗P-∗THWW2-1M	830
LF2B-F∗P-∗THWW2-1M	1,080

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(13/02/15)

Specifications

Model		LF2B-B (210mm)	LF2B-C (330mm)	LF2B-D (580mm)	LF2B-E (830mm)	LF2B-F (1,080mm)
Rated Voltage		100 to 240V AC, 50/60 Hz (voltage range: 90 to 264V AC)				
		12/24V DC (voltage range: 10.8 to 30V DC)				
Input Current (typ.) (at the rated current) (Note 1)	100 to 240V AC	33 mA	67 mA	96 mA	149 mA	226 mA
	12/24V DC	215 mA	409 mA	880 mA		
Power Consumption (typ.) (at the rated voltage)	100 to 240V AC	3.8W	7.5W	9.2W	14.3W	21.8W
	12/24V DC	2.6W	4.9W	10.6W		
Insulation Resistance		100MΩ min. (500V DC meggar)				
Dielectric Strength	100 to 240V AC	2,000V AC, 1 minute (between live and dead parts)				
	12/24V DC	1,000V AC, 1 minute (between live and dead parts)				
Vibration Resistance (damage limits)		Frequency: 5 to 55 Hz, Amplitude 0.17 mm Acceleration 20m/s², 2 hours each in 3 axes				
Shock Resistance (damage limits)		300m/s², 5 shocks each in 6 axes				
Operating Temperature		−30 to +55°C (no condensation)				
Operating Humidity		45 to 85% (no freezing)				
Storage Temperature		−35°C to +70°C (no condensation)				
Operating Atmosphere		No corrosive gas				
Life (Note 2)		40,000 hours (Ta = 25°C) (The total illumination life in which the illuminance maintains a minimum of 70% of the initial value.)				
Degree of Protection		IP65 (IEC 60529)				
Material		Cover: polycarbonate, End cover/cable gland: polyamide. Wire: PVC (AWG24×2C)				
Weight (approx.)	100 to 240V AC	200g	255g	400g	520g	645g
	12/24V DC	175g	235g	370g		

Note 1: 100 to 240V AC: at 100V AC, 12/24V DC: 12V DC   Note 2: LED life depends on the operating environment.

## LED Optical Specifications

| Illumination Color		White								
Color Temperature		5,500K								
Model		**LF2B-B** (210mm)		**LF2B-C** (330mm)		**LF2B-D** (580mm)		**LF2B-E** (830mm)		**LF2B-F** (1,080mm)
Luminous Flux (typ.)		180 lm		360 lm		720 lm		1,080 lm		1,440 lm
Cover		Clear	White	Clear	White	Clear	White	Clear	White	Clear	White
Reference Illuminance (typ.) at 0.5m directly below		230 lx	215 lx	425 lx	390 lx	710 lx	645 lx	930 lx	835 lx	1,160 lx	1,040 lx

• LED modules and illumination units may vary in illumination colors and illuminance.
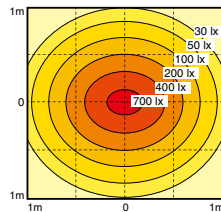
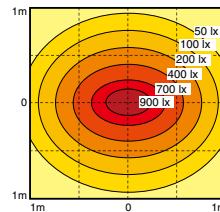## Illuminance Distribution at 0.5m (clear cover)
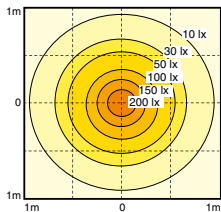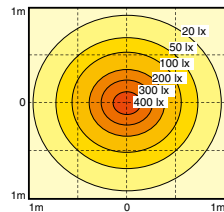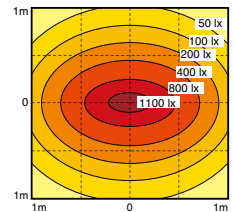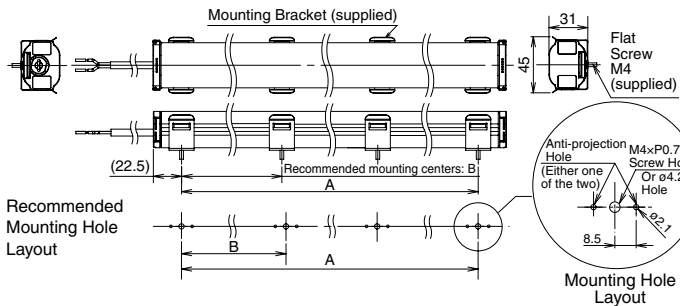
LF2B-B (210mm) **LF2B-C (330mm)** **LF2B-D (580mm)** **LF2B-E (830mm)** **LF2B-F (1,080mm)**
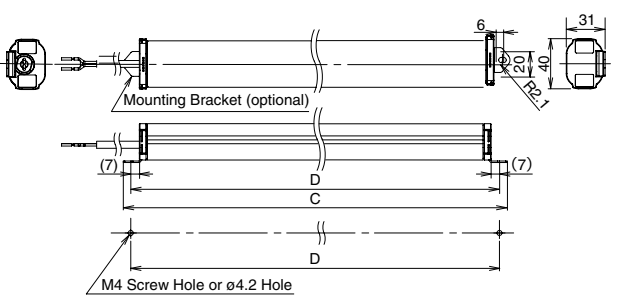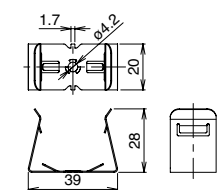

Dimensions

With mounting bracket LF9Z-1SB21
(U-shaped brackets supplied with LED)

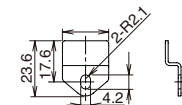**With mounting bracket LF9Z-1SB22**
(L-shaped bracket purchased separately from LED)

Mounting bracket LF9Z-1SB21

Mounting bracket LF9Z-1SB22
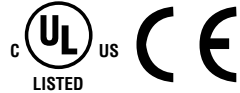

Part No.	A	B	C	D	Required No. of Mounting Bracket	
					LF9Z-1SB21	LF9Z-1SB22
LF2B-B∗P-∗THWW2-1M	165	—	236	224		
LF2B-C∗P-∗THWW2-1M	285	—	356	344	2	
LF2B-D∗P-∗THWW2-1M	535	—	606	594		2
LF2B-E∗P-∗THWW2-1M	785	393	856	844	3	
LF2B-F∗P-∗THWW2-1M	1,035	345	1,106	1,094	4	

LUMIFA™
LF1B-N LED Illumination Units

Thin and slim styles fit into compact spaces.
IP65 (waterproof, dustproof). 6 different lengths and 6 distinct colors.

- Compact design (27.5mm wide, 16mm high, and 134 to 1,080mm long) fits into narrow spaces.
- Improved brightness with white illumination color.
- White, warm white, yellow, red, blue, and green illumination colors.
- Two cover colors: clear and white.

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| Illumination Color		White	Warm White	Yellow	Red	Blue	Green
Shape	Clear cover						
	White cover						
LF1B-NA (134mm)	Clear cover	LF1B-NA3P-2THWW2-∗	LF1B-NA3P-2TLWW2-∗	LF1B-NA3P-2SHY2-∗	LF1B-NA3P-2SHR2-∗	LF1B-NA3P-2THS2-∗	LF1B-NA3P-2SHG2-∗
	White cover	LF1B-NA4P-2THWW2-∗	LF1B-NA4P-2TLWW2-∗	LF1B-NA4P-2SHY2-∗	LF1B-NA4P-2SHR2-∗	LF1B-NA4P-2THS2-∗	LF1B-NA4P-2SHG2-∗
LF1B-NB (210mm)	Clear cover	LF1B-NB3P-2THWW2-∗	LF1B-NB3P-2TLWW2-∗	LF1B-NB3P-2SHY2-∗	LF1B-NB3P-2SHR2-∗	LF1B-NB3P-2THS2-∗	LF1B-NB3P-2SHG2-∗
	White cover	LF1B-NB4P-2THWW2-∗	LF1B-NB4P-2TLWW2-∗	LF1B-NB4P-2SHY2-∗	LF1B-NB4P-2SHR2-∗	LF1B-NB4P-2THS2-∗	LF1B-NB4P-2SHG2-∗
LF1B-NC (330mm)	Clear cover	LF1B-NC3P-2THWW2-∗	LF1B-NC3P-2TLWW2-∗	LF1B-NC3P-2SHY2-∗	LF1B-NC3P-2SHR2-∗	LF1B-NC3P-2THS2-∗	LF1B-NC3P-2SHG2-∗
	White cover	LF1B-NC4P-2THWW2-∗	LF1B-NC4P-2TLWW2-∗	LF1B-NC4P-2SHY2-∗	LF1B-NC4P-2SHR2-∗	LF1B-NC4P-2THS2-∗	LF1B-NC4P-2SHG2-∗
LF1B-ND (580mm)	Clear cover	LF1B-ND3P-2THWW2-∗	LF1B-ND3P-2TLWW2-∗	LF1B-ND3P-2SHY2-∗	LF1B-ND3P-2SHR2-∗	LF1B-ND3P-2THS2-∗	LF1B-ND3P-2SHG2-∗
	White cover	LF1B-ND4P-2THWW2-∗	LF1B-ND4P-2TLWW2-∗	LF1B-ND4P-2SHY2-∗	LF1B-ND4P-2SHR2-∗	LF1B-ND4P-2THS2-∗	LF1B-ND4P-2SHG2-∗
LF1B-NE (830mm)	Clear cover	LF1B-NE3P-2THWW2-∗	LF1B-NE3P-2TLWW2-∗	LF1B-NE3P-2SHY2-∗	LF1B-NE3P-2SHR2-∗	LF1B-NE3P-2THS2-∗	LF1B-NE3P-2SHG2-∗
	White cover	LF1B-NE4P-2THWW2-∗	LF1B-NE4P-2TLWW2-∗	LF1B-NE4P-2SHY2-∗	LF1B-NE4P-2SHR2-∗	LF1B-NE4P-2THS2-∗	LF1B-NE4P-2SHG2-∗
LF1B-NF (1,080mm)	Clear cover	LF1B-NF3P-2THWW2-∗	LF1B-NF3P-2TLWW2-∗	LF1B-NF3P-2SHY2-∗	LF1B-NF3P-2SHR2-∗	LF1B-NF3P-2THS2-∗	LF1B-NF3P-2SHG2-∗
	White cover	LF1B-NF4P-2THWW2-∗	LF1B-NF4P-2TLWW2-∗	LF1B-NF4P-2SHY2-∗	LF1B-NF4P-2SHR2-∗	LF1B-NF4P-2THS2-∗	LF1B-NF4P-2SHG2-∗
Application		• Machine tools • Plant equipment • Inspection/test equipment • Control panel	• Food processing machines • Cosmetic plants • Chemical plants • Showcases	• Semiconductor manufacturing equipment • IC foundries	• Photosensitive materials • Semiconductor manufacturing equipment • Darkroom experiment	• Advertising Display • Light ornaments	

- Specify cable length in place of ∗ in Part No. 1M: 1m, 3M: 3m
- Use Class 2 power supply when using the LF1B-N as UL/c-UL listed LED illumination unit.

Part No. Development

LF1B - NC3P - 2THWW2 - 1M

Length
A: 134mm
B: 210mm
C: 330mm
D: 580mm
E: 830mm
F: 1,080mm

Cover
3: Clear
4: White

Illumination color
THWW2: White
TLWW2: Warm white
SHY2: Yellow
SHR2: Red
THS2: Blue
SHG2: Green

Cable length
1M: 1m
3M: 3m

Internal Circuit

Brown (+) — Fuse — ▷ — LED
Blue (−) —

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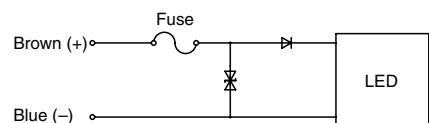
Specifications

Model		LF1B-NA (134mm)	LF1B-NB (210mm)	LF1B-NC (330mm)	LF1B-ND (580mm)	LF1B-NE (830mm)	LF1B-NF (1,080mm)
Rated Voltage		24V DC (operating voltage range: 21.6 to 26.4V)					
Input Current (typ.) (at the rated current)	white/warm white/blue	60mA	120mA	180mA	360mA	540mA	720mA
	red/yellow/green	40mA	80mA	120mA	240mA	360mA	480mA
Power Consumption (typ.) (at the rated voltage)	white/warm white/blue	1.5W	2.9W	4.4W	8.7W	13.0W	17.3W
	red/yellow/green	1.0W	2.0W	2.9W	5.8W	8.7W	11.6W
Insulation Resistance		100MΩ minimum (500V DC megger)					
Dielectric Strength		1,000V AC, 1 minute (between live and dead parts)					
Vibration Resistance (damage limits)		Frequency: 5 to 55 Hz, Amplitude 0.5mm Acceleration 60m/s², 2 hours each in 3 axes				Frequency: 5 to 55 Hz, Amplitude 0.17mm Acceleration 20m/s², 2 hours each in 3 axes	
Shock Resistance (damage limits)		1,000m/s², 5 shocks each in 6 axes				300m/s², 5 shocks each in 6 axes	
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 Atmosphere		No corrosive gases					
Life (Note)		40,000 hours (Ta = 25°C) (The total illumination life in which the illuminance maintains a minimum of 70% of the initial value.)					
Degree of Protection		IP65 (IEC 60529)					
Material		Cover: polycarbonate, End cover/cable gland: polyamide, Wire: PVC (24AWG × 2C)					
Weight (approx.)		95g	125g	165g	255g	430g	740g

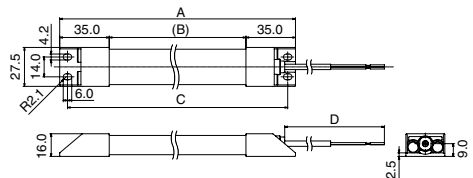Note: LED life depends on the operating environment.

LED Optical Specifications

Illumination Color		White	Warm White	Yellow	Red	Green	Blue
Color Temperature/ Dominant Wavelength (typ.)		5,500K	2,900K	590nm	620nm	525nm	455nm
Reference Illuminance (typ.) at 0.5m directly below	LF1B-NA	Clear: 90 lx White: 80 lx	Clear: 60 lx White: 55 lx	Clear: 20 lx White: 18 lx	Clear: 20 lx White: 18 lx	Clear: 30 lx White: 27 lx	Clear: 10 lx White: 9 lx
	LF1B-NB	Clear: 220 lx White: 200 lx	Clear: 145 lx White: 130 lx	Clear: 40 lx White: 36 lx	Clear: 40 lx White: 36 lx	Clear: 60 lx White: 55 lx	Clear: 20 lx White: 18 lx
	LF1B-NC	Clear: 400 lx White: 360 lx	Clear: 250 lx White: 225 lx	Clear: 75 lx White: 65 lx	Clear: 75 lx White: 65 lx	Clear: 110 lx White: 100 lx	Clear: 30 lx White: 27 lx
	LF1B-ND	Clear: 660 lx White: 600 lx	Clear: 455 lx White: 410 lx	Clear: 125 lx White: 110 lx	Clear: 125 lx White: 110 lx	Clear: 190 lx White: 170 lx	Clear: 50 lx White: 45 lx
	LF1B-NE	Clear: 820 lx White: 740 lx	Clear: 560 lx White: 500 lx	Clear: 160 lx White: 145 lx	Clear: 160 lx White: 145 lx	Clear: 260 lx White: 235 lx	Clear: 60 lx White: 55 lx
	LF1B-NF	Clear: 935 lx White: 850 lx	Clear: 620 lx White: 555 lx	Clear: 180 lx White: 160 lx	Clear: 180 lx White: 160 lx	Clear: 300 lx White: 270 lx	Clear: 80 lx White: 70 lx

• LED modules and illumination units may vary in illumination colors and illuminance.

Illuminance Distribution at 0.5m (reference value)

LF1B-NA3P-2THWW2-∗

LF1B-NB3P-2THWW2-∗

LF1B-NC3P-2THWW2-∗

LF1B-ND3P-2THWW2-∗

LF1B-NE3P-2THWW2-∗

LF1B-NF3P-2THWW2-∗
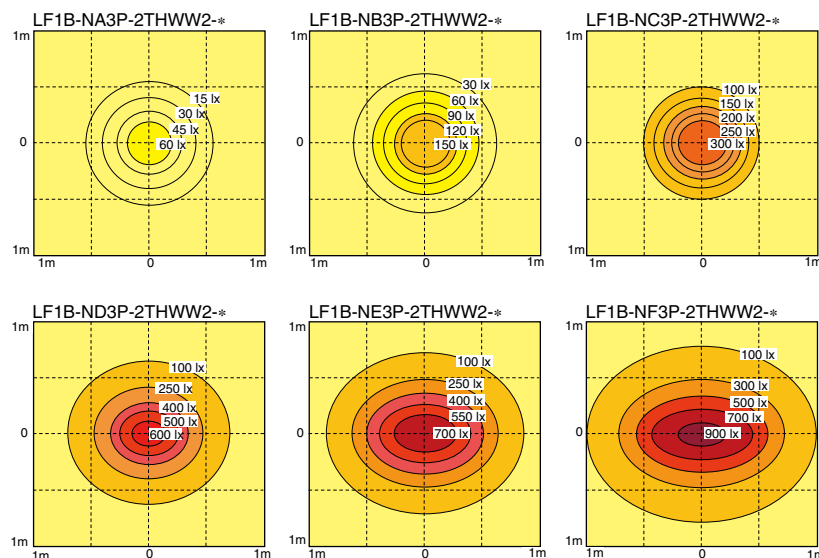
Dimensions

Model	A	B	C
LF1B-NA	134	64	123
LF1B-NB	210	140	199
LF1B-NC	330	260	319
LF1B-ND	580	510	569
LF1B-NE	830	760	819
LF1B-NF	1,080	1,010	1,069

Model	D
LF1B-N∗-2∗-1M	1,000
LF1B-N∗-2∗-3M	3,000

All dimensions in mm.

LUMIFA™
LF1A LED Illumination Units

Energy saving LED illumination units, only 1/3 power consumption compared with fluorescent lamps.

• 40,000 hour service life, no maintenance needed.
• LED modules and highly efficient heat dissipation technology achieves low heat generation.
• Only 22mm high, making it possible to installing inside a small space.
• White, warm white, yellow, and red.

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LED Illumination Units

Illumination Color		White	Warm White	Yellow	Red
Part No.	3 LEDs × 2 columns	**LF1A-A1-2THWW6-∗**	**LF1A-A1-2TLWW6-∗**	**LF1A-A1-2SHY8-∗**	**LF1A-A1-2SHR8-∗**
	6 LEDs x 2 columns	**LF1A-B1-2THWW6-∗**	**LF1A-B1-2TLWW6-∗**	**LF1A-B1-2SHY8-∗**	**LF1A-B1-2SHR8-∗**
	6 LEDs × 2 columns	**LF1A-D1-2THWW6-∗**	**LF1A-D1-2TLWW6-∗**	**LF1A-D1-2SHY8-∗**	**LF1A-D1-2SHR8-∗**
Shape					
Spectrum		400nm 700nm	400nm 700nm	400nm 700nm	400nm 700nm
Features		Suppressing glare, the bright, clear white illumination color lights up a target object clearly.	Warm color similar to that of an incandescent light bulb. This illumination color gives off a color temperature of 2800K.	Yellow illumination color gives off an emission spectrum with a dominant wavelength of 590 nm. It does not include 500 nm or shorter wavelengths.	Red illumination color gives off an emission spectrum with a long wavelength (dominant wavelength of 625 nm).
Application Examples		• Machine Tools • Control Panel/Plant Equipment • Inspection/Test Equipment	• Food Processing Machines • Cosmetic Plants • Chemical Plants	• Semiconductor Manufacturing Equipment • IC Plants	• Application Equipment for Photographic Laboratory • Semiconductor Manufacturing Equipment • Darkroom Experiments

Note: Insert "U" in place of ∗ for LED illumination unit with UL/c-UL/CE marking. Use Class 2 power supply when using the LF1A as UL/c-UL listed LED illumination unit.

Specifications

Part No.		LF1A-∗-2THWW6 LF1A-∗-2TLWW6	LF1A-∗-2SHY8 LF1A-∗-2SHR8
Rated Voltage		24V DC (non-polarized)	
Input Current (typ.) (at rated voltage)	3 LEDs x 2 rows	75mA	90mA
	6 LEDs x 2 rows	150mA	180mA
	12 LEDs x 2 rows	300mA	360mA
Rated Power (typ.) (at rated voltage)	3 LEDs x 2 rows	1.8W	2.2W
	6 LEDs x 2 rows	3.6W	4.4W
	12 LEDs x 2 rows	7.2W	8.7W
Insulation Resistance		Between live and dead parts: 100 MΩ (500V DC megger)	
Dielectric Strength		Between live and dead parts: 1000V AC, 1 minute	
Vibration Resistance (Damage limits)		5 to 55Hz, 0.5mm 20m/s²	
Shock Resistance (Damage Limits)		980m/s²	
Operating Temperature		−20 to 50°C	
Operating/Storage Humidity		45 to 85% RH (no condensation)	
Storage Temperature		−25 to +70˚C	
Operating Atmosphere		No corrosive gas	
Life		40000 hours (The total illumination duration in which the luminance maintains a minimum of 70% of the initial value.)	
Weight (approx.)		LF1A-A1: 190g, LF1A-B1: 270g, LF1A-D: 470g	
Degree of Protection		IP40	

Material		Without UL/c-UL/CE marking:
		    Housing: AL, End plate: SPCC, Lens: PMMA (Polymethyl methacrylate), Cable gland: Brass, Wire: PVC (VCTF0.3sq)
		With UL/c-UL/CE marking:
		    Housing: AL, End plate: SPCC, Lens: PC (Polycarbonate)
		    Cable gland: Brass, Wire: PVC (RO-FLEX1000T AWG22)	

Note: Insert "U" in place of ∗ for LED illumination unit with UL/c-UL/CE marking.

Part No. Development

LF1A- A1 - 2 THWW6

Rated Voltage
2: 24V DC

LED arrangement:
A1: 3 LEDs × 2 columns
B1: 6 LEDs × 2 columns
D1: 12 LEDs × 2 columns

LED illumination color
THWW6: White
TLWW6: Warm White
SHY8: Yellow
SHR8: Red

LED Optical Specifications

Part No.	LF1A-∗2THWW6-∗	LF1A-∗2TLWW6-∗	LF1A-∗-2SHY8-∗	LF1A-∗-2SHR8-∗
Illumination Color	White	Warm White	Yellow	Red
Luminous Intensity (typ.) (Single LED module)	6000mcd	4000mcd	4000mcd	2500mcd
Color Temperature (typ.) / Dominant Wavelength (typ.)	5500K	2800K	590nm	625nm
Reference Illuminance (typ.) at 50 cm — 3 LEDs × 2 rows	190 lx	130 lx	130 lx	85 lx
Reference Illuminance (typ.) at 50 cm — 6 LEDs × 2 rows	380 lx	260 lx	260 lx	170 lx
Reference Illuminance (typ.) at 50 cm — 12 LEDs × 2 rows	760 lx	520 lx	520 lx	340 lx

Note: Insert "U" in place of ∗ for LED illumination unit with UL/c-UL/CE marking.

Dimensions

R2.25

Wire (non-polarized)
VCTF0.3SQ × 2 cores
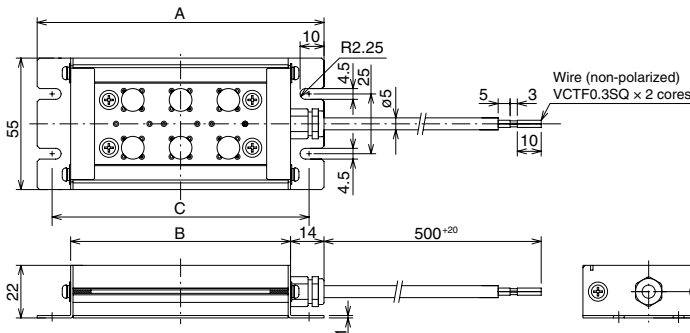
Model	A	B	C
LF1A-A1-∗	120	92	108
LF1A-B1-∗	180	152	168
LF1A-D1-∗	300	272	288

All dimensions in mm.

Internal Circuit

Black

24V DC
(non-polarized)

White

R

R

R

LED

LUMIFA™
LF1E LED Illumination Units
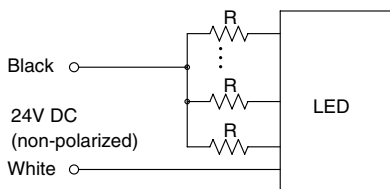
LED illumination units for freezer and refrigerated display cases.

- LED light sources achieve energy saving, long service life, reduced mounting space, elimination of noise, and low heat generation.
- Available in 4 lengths of 550, 808, 1066, and 1450 mm designed to meet the width of display cases.
- 3 types of light distribution characteristics are available; no-lens, condensing lens, and dual lens.
- IP54 protection against dust and water.

Specifications

Model	LF1E-A	LF1E-B	LF1E-C	LF1E-D	LF1E-E
Length (mm)	292	550	808	1066	1450
Rated Voltage	24V DC (voltage range: 21.6 to 26.4V DC)				
Input Current (typ.) (at rated input)	175mA	350 mA	525 mA	700 mA	950 mA
Power Consumption (typ.) (at rated input)	4.2W	8.4W	12.6W	16.8W	22.8W
Insulation Resistance	100 MΩ minimum (500V DC megger) between input and housing				
Dielectric Strength	500V AC, 1 minute				
Vibration Resistance (damage limits)	Frequency 5 to 55 Hz, Amplitude 0.17 mm				
Shock Resistance (damage limits)	300 m/s^2				
Operating Temperature	–40 to +40°C (no freezing)				
Operating Humidity	45 to 85% RH (no condensation)				
Storage Temperature	–40 to +70°C (no freezing)				
Operating Atmosphere	No corrosive gases				
Life (Note 1)	40,000 hours (The total illumination duration where the illuminance maintains a minimum of 70% of the initial value in 25°C environment.)				
Weight (approx.) (Note 2)	150g	275g	390g	515g	690g
Degree of protection	IP54				
Materials	End cover, conduit: polyamide Cover: polycarbonate Cable: PVC Mounting bracket: stainless steel				

Note 1: LED life depends on the operating environment.   Note 2: Dual lens
- Use Class 2 power supply when using the LF1E as UL/c-UL listed LED illumination unit.

LED Optical Specifications (clear lens)

Illumination Color			White	Warm white
Color Temperature (typ.)			5000K	3000K
	Lens	Unit Length	Illuminance	
Reference Illuminance (typ.) (Measured at 0.3m directly below the unit)	No-lens (Note)	292 mm	630 lx	480 lx
		550 mm	950 lx	750 lx
		808 mm	1100 lx	900 lx
		1066 mm	1200 lx	950 lx
		1450 mm	1250 lx	1000 lx
	Condensing Lens (Note)	292 mm	1800 lx	1400 lx
		550 mm	1950 lx	1500 lx
		808 mm	2000 lx	1550 lx
		1066 mm	2000 lx	1550 lx
		1450 mm	2000 lx	1550 lx
	Dual Lens		See the illuminance distribution chart on page 23.	

Note: LED modules and illumination units may vary in illumination colors and illuminance.

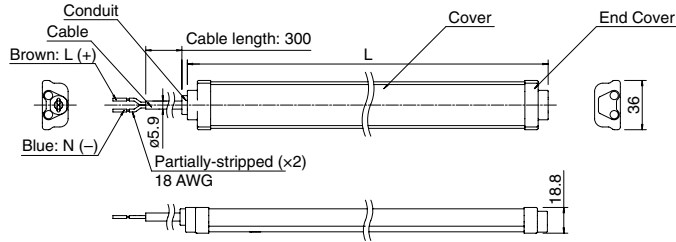## Part No. Development

LF1E - B 3 S - 2 N A

- Length (mm)
  - A: 292
  - B: 550
  - C: 808
  - D: 1,066
  - E: 1,450
- Cover
  - 3: Clear
  - 4: White
- Degree of Protection
  - S : IP54
- Input Voltage
  - 2: 24V DC
- LED color
  - N: White (5000 K equivalent)
  - L: Warm white (3000 K equivalent)
- Light Distribution (Lens)
  - Blank: No lens
  - A: Condensing lens
  - B: Dual lens
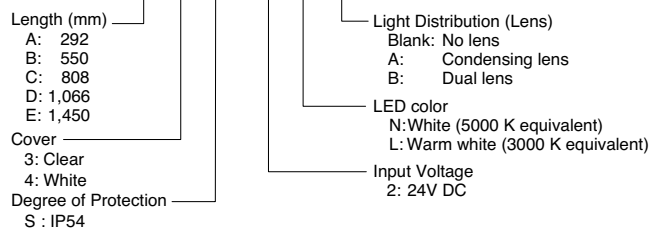
Accessories

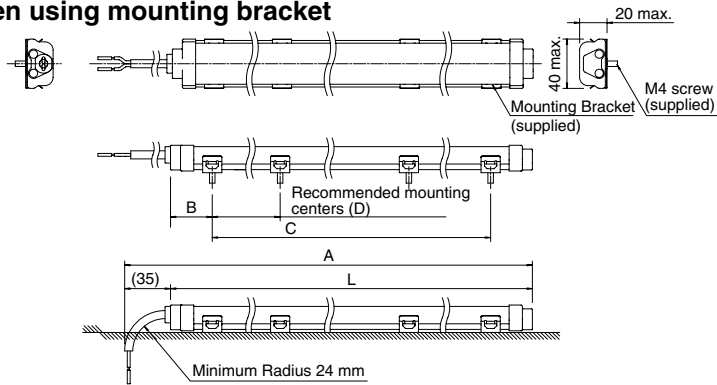| Item	Part No.	Package Quantity
Mounting Bracket	LF9Z-1SE1PN05	5

- Five mounting screws are supplied (one mounting screw is used for a mounting bracket)
- Number of mounting brackets supplied: LF1E-B (2), LF1E-C (3), LF1E-D (4) and LF1E-E (4)
  When installing the LF1E unit in the place subject to excessive vibrations, supply additional mounting brackets.
- See page 23 for dimensions.

IDEC

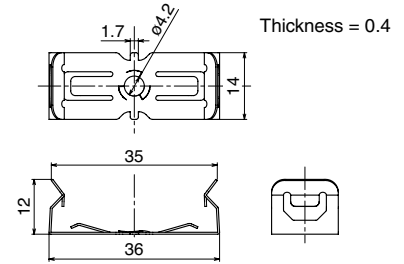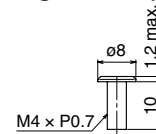## Dimensions

LF1E Illumination Unit

Conduit
Cable
Brown: L (+)
Blue: N (–)
Partially-stripped (×2)
18 AWG
ø5.9
Cable length: 300
L
Cover
End Cover
36
18.8

When using mounting bracket

20 max.
40 max.
M4 screw (supplied)
Mounting Bracket (supplied)
Recommended mounting centers (D)
B
C
A
(35)
L
Minimum Radius 24 mm

Mounting Hole Layout

Anti-rotation Hole (Use one)
ø2.1
6 6
M4 × P0.7 tapped hole or ø4.2 hole

Mounting Bracket (supplied) (LF9Z-1SE1)

1.7   ø4.2
Thickness = 0.4
14
12
35
36

Mounting Screw (supplied)

ø8
1.2 max.
10
M4 × P0.7

All dimensions in mm.
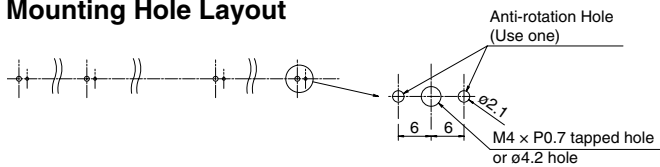
Model	L	A	B	C	D	No. of Mounting Brackets
LF1E-A	292	327	36	220	220	2
LF1E-B	550	585	30	490	490	2
LF1E-C	808	843	29	750	375	3
LF1E-D	1066	1101	30.5	1005	335	4
LF1E-E	1450	1485	32	1386	462	4

Illuminance Distribution Chart

X: long side
Y: short side

No-lens

0 20 40 60 80 100 (%)
90°   90°
45°   45°
0°
Y (short side) image

Condensing Lens

0 20 40 60 80 100 (%)
90°   90°
45°   45°
0°
Y (short side) image

Dual Lens

0 20 40 60 80 100 (%)
90°   90°
45°   45°
0°
Y (short side) image
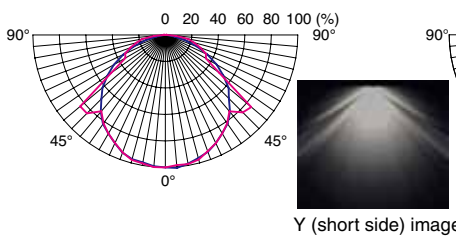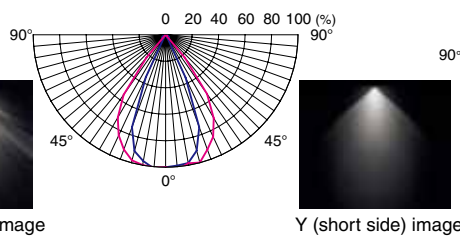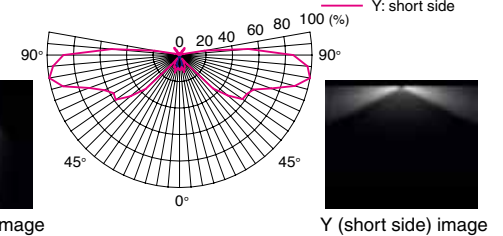
Illumination Chart (reference value of 5000K at 0.3m. Dual lens type at 50 mm.)

No-lens (LF1E-E3S-2N)
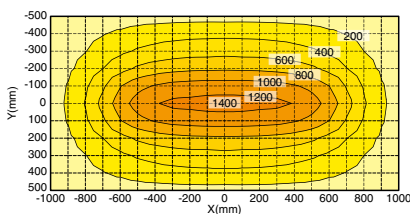
Condensing Lens (LF1E-E3S-2NA)
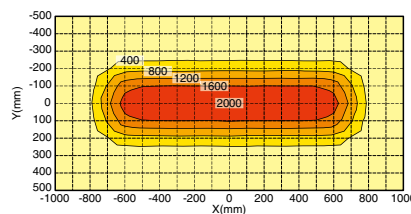
Dual Lens (LF1E-E3S-2NB)
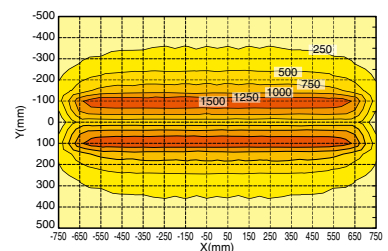
LUMIFA™
LF Series Adjustable Angle Mounting Bracket

Mounting angle can be adjusted from 0° to 90°. LED illumination units can be installed flexibly.

- Mounting angle can be adjusted from 0° to 90° in 10° increments, providing more options for mounting of the LED illumination units.
- Illumination angle can be adjusted to suit the operator in various applications, such as visual inspection.
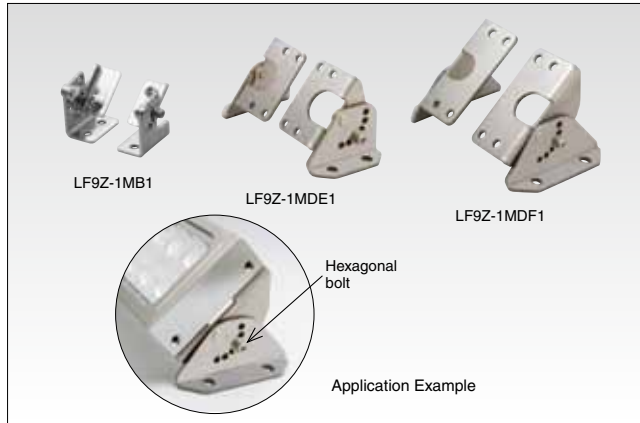
LF9Z-1MB1 LF9Z-1MDE1 LF9Z-1MDF1

Hexagonal bolt

Application Example

Adjustable Angle Mounting Bracket

	Part No.	Applicable LED Illumination Unit	Material	Package Quantity
Adjustable Angle Mounting Bracket for LF1D/LF1B	**LF9Z-1MDE1**	LF1D-E	Stainless Steel	1 pair (right and left) (mounting screws supplied)
	LF9Z-1MDF1	LF1D-F		
	LF9Z-1MB1	LF1B-A, -B, -C (not -D)		

Dimensions

LF9Z-1MDE1
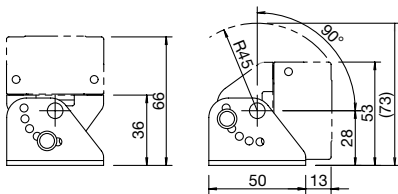
LF9Z-1MDF1
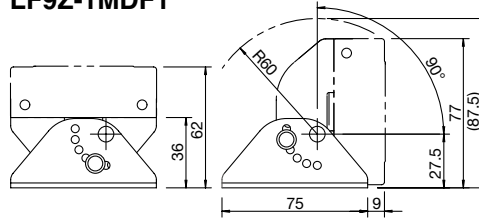
LF9Z-1MB1
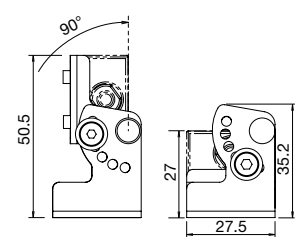
All dimensions in mm.

- Use the attached hexagonal bolts to fix the LF1D at the desired angle.
- See specifications of the LF1D for operating environment and mechanical strength.

Mounting Hole Layout

4-M5 screws
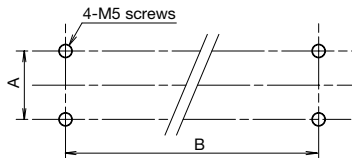
Part No.	E	F	G
LF9Z-1MDE1	25 ±0.2	374 ±2.0	4-M5
LF9Z-1MDF1	40 ±0.2	292 +4.0/−2.0	4-M5
LF9Z-1MB1	14	(Note)	4-M4

Note: Same as the mounting hole centers of LED illumination units.

LF Series LED Illumination Units

⚠ Safety Precautions

- Do not disassemble, repair, or modify the LED illumination unit. Otherwise electric shock, fire, or malfunction may occur.
- Turn off power before wiring. 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.

- 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.
- Ensure that the cable does not touch the LED illumination unit.

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.
- The illumination unit is vulnerable to static electricity. Take sufficient measure for protection against static electricity and voltage surges.
- Make sure that the illumination unit does not fall during transportation, installation, and operation, otherwise damage may result.
- Do not pull or push the cable of the illumination unit, otherwise damage may result. Allow sufficient slack to the cable while wiring.
- Do not apply excessive force. Do not leave a damaged illumination unit unattended or use a damaged illumination unit.
- Ensure the correct operating temperature. Otherwise internal temperature rise may result in damage.
- Do not use or store in a place subjected to vibration and shock.

- Do not use in the following places:
  * Exposed to direct sunlight, near heaters, high temperatures
  * Subject to chemicals, and corrosive gases
    (Plastic illumination surface: Iron powder and oil)
  * Basements, greenhouses, or other humid places
  * Cold storage warehouses (make sure that no freezing occurs)
- Do not loosen screws, otherwise the protection characteristics will be impaired.
- For the LF2D illumination units, make sure to provide sufficient strength for mounting panel. Required waterproof characteristics cannot be obtained if a distorted mounting panel is used.
- 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 construction. Water may invade the LF1B in a capillary action when water splashes directly onto the cable sheath.

IDEC

LUMIFA™
Explosion-proof
EF1A Flameproof LED Illumination Units

Can be used in hazardous area of Zone 1 and 2, where hydrogen or acetylene gas are present.

- Various mounting styles.
- Condensing or diffused light distribution characteristics.
- Screw terminal, spring clamp terminal, and lead wire connection are available.
- IP67 (IEC 60529)

Explosion-proof Class
Ex d II CT4

TIIS
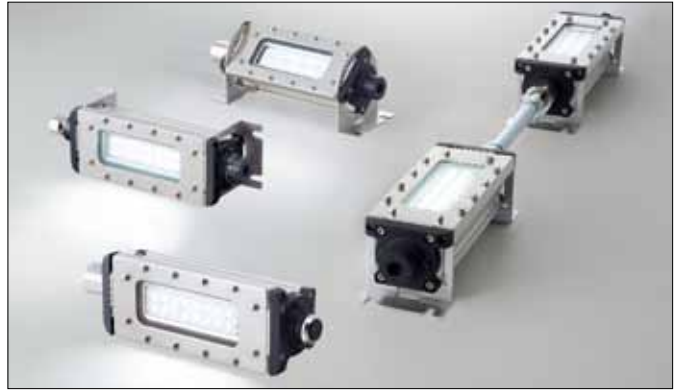
Package quantity: 1

Input	Light Distribution	Mounting Bracket		Cable Clamp Waterproof	Illumination Surface ①	Terminal Block ②	Applicable Cable Diameter ③	Part No.
100 to 240V AC	Condensing	Direct Mounting		Yes	Clear glass: Blank Translucent glass: 1	Spring clamp: Blank Screw: S Lead wire: C	10: ø8 to ø10 12: ø10 to ø12 14: ø12 to ø14 16: ø14 to ø16	EF1A-12①W②-③
				No				EF1A-12①W②-③W
		Mounting Bracket		Yes				EF1A-12①W②A-③
				No				EF1A-12①W②A-③W
		Angle Adjustable Mounting Bracket		Yes				EF1A-12①W②B-③
				No				EF1A-12①W②B-③W
	Diffused	Direct Mounting		Yes				EF1A-12①W1②-③
				No				EF1A-12①W1②-③W
		Mounting Bracket		Yes				EF1A-12①W1②A-③
				No				EF1A-12①W1②A-③W
		Angle Adjustable Mounting Bracket		Yes				EF1A-12①W1②B-③
				No				EF1A-12①W1②B-③W
24V DC	Condensing	Direct Mounting		Yes				EF1A-11①W②-③
				No				EF1A-11①W②-③W
		Mounting Bracket		Yes				EF1A-11①W②A-③
				No				EF1A-11①W②A-③W
		Angle Adjustable Mounting Bracket		Yes				EF1A-11①W②B-③
				No				EF1A-11①W②B-③W
	Diffused	Direct Mounting		Yes				EF1A-11①W1②-③
				No				EF1A-11①W1②-③W
		Mounting Bracket		Yes				EF1A-11①W1②A-③
				No				EF1A-11①W1②A-③W
		Angle Adjustable Mounting Bracket		Yes				EF1A-11①W1②B-③
				No				EF1A-11①W1②B-③W

- Specify "T" before ② in the part number for both input and output ends to have a cable gland. Applicable cable diameter is the same for both ends.
  Part No. example: EF1A-12WT-10
- Specify "P" before ② and "-A2" at the end of the part number when the input end has cable gland and the output end has ON/OFF switch.
  Part No. example: EF1A-121W1P-10-A2

Specifications

Part No.	EF1A-12	EF1A-11
Explosion Protection	Ex d IIC T4	
Installation Area	Zone 1, Zone 2	
Rated Voltage	100 to 240V AC	24V DC
Voltage Range	90 to 264V AC	18 to 26.4V DC
Power Consumption (typ.) (at rated voltage)	19W	16W
Insulation Resistance	100MΩ minimum (500V DC megger) (between input and ground)	
Dielectric Strength	2,000V AC, 1 minute (between input and ground)	
Vibration Resistance (damage limits)	Frequency 5 to 55 Hz, amplitude 0.5mm	
Shock Resistance (damage limits)	1,000 m/s²	
Operating Temperature	−20 to +50°C (no freezing)	
Operating Humidity	45 to 85% RH (no condensation)	
Storage Temperature	−35 to +70°C (no freezing)	
Service Life (Note)	Approx. 50,000 hours minimum (The total illumination duration where the illuminance maintains a minimum of 70% of the initial value in 25°C environment.)	
Degree of Protection	IP67 (IEC 60529), IP65 (with ON/OFF switch)	
Material	Housing: aluminium, front panel/mounting bracket: stainless steel, illumination surface: reinforced glass, cable gland: nickel-plated brass	
Weight (approx.)	3.2kg (direct mounting) 3.4kg (with mounting bracket)	

Note: LED life depends on the operating environment.

Part No. Development

E F 1 A – 1 1 1 W 1 P S A – 12 W – A2

Rated Voltage
1: 24VDC
2: Universal voltage (100 to 240V AC)

Illumination Surface
Blank: Clear glass
1: Translucent glass

Light Distribution
Blank: Condensing light (with lens)
1: Diffused light (without lens)

Cable gland & ON/OFF switch
Blank: Cable gland on one end/ without ON/OFF switch
T: Cable gland on both ends/ without ON/OFF switch
P: Cable gland on one end/ with ON/OFF switch

Terminal Block
Blank: Spring clamp terminal block
S: Screw terminal block
C: Lead wire

Mounting Bracket
Blank: Without (direct mounting)
A: With mounting bracket
B: Angle adjustable mounting bracket

Applicable Cable Diameter
10: ø to 10 (G1/2)
12: ø10 to 12 (G1/2)
14: ø12 to 14 (G3/4)
16: ø14 to 16 (G3/4)

Cable gland
Blank: Clamp with waterproof
W: Clamp without waterproof

ON/OFF switch
A2: extended (maintained)

EF1A Flameproof LED Illumination Units

LED Optical Specifications

Illumination Surface	Clear glass		Translucent glass	
Lens	With (condensing light)	Without (diffused light)	With (condensing light)	Without (diffused light)
Illumination Color	White			
Color Temperature (typ.)	5,700K			
Total Luminous Flux (typ.)	960 lm			
Reference Illuminance (typ.) (at 1.0m directly below)	1100 lx	205 lx	450 lx	175 lx

TIIS Certified Products of the Same Model

Part No.	Lens	ON/OFF switch	TIIS Type Test Approval No.
EF1A-1∗W	With (condensing light)	Without	TC19541
EF1A-1∗WP	With (condensing light)	With	TC19542
EF1A-1∗W1	Without (diffused light)	Without	TC19540
EF1A-1∗W1P	Without (diffused light)	With	TC19543

• Same model range includes voltage, illumination surface glass, cable gland type and size.

Illumination Distribution Chart (unit: cd/1000 lm)

Condensing Light

Illumination Surface:
Clear glass (with lens)
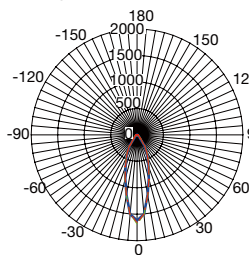
Illumination Surface:
Translucent glass (with lens)

Diffused Light
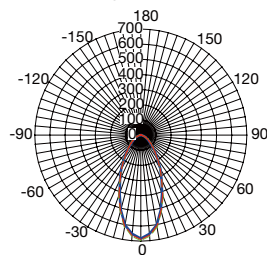
Illumination Surface:
Clear glass (without lens)
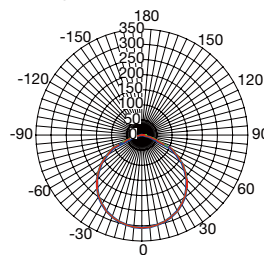
Illumination Surface:
Translucent glass (without lens)
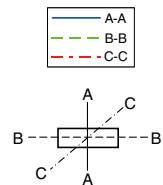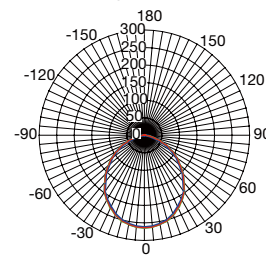
Illuminance Distribution at 1.0m (reference value)

Condensing Light (lx)

Illumination Surface:
Clear glass (with lens)
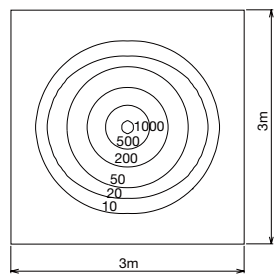
Illumination Surface:
Translucent glass (with lens)
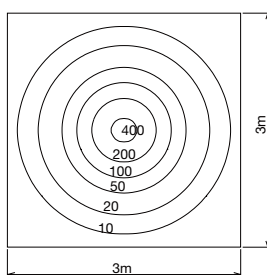
Diffused Light (lx)

Illumination Surface:
Clear glass (without lens)
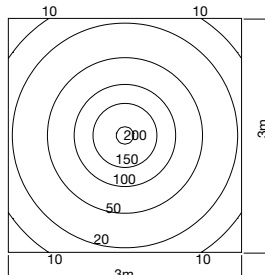
Illumination Surface:
Translucent glass (without lens)
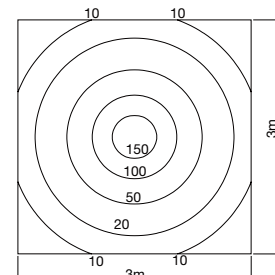
Dimensions

W/Angle Adjustable Mounting Bracket
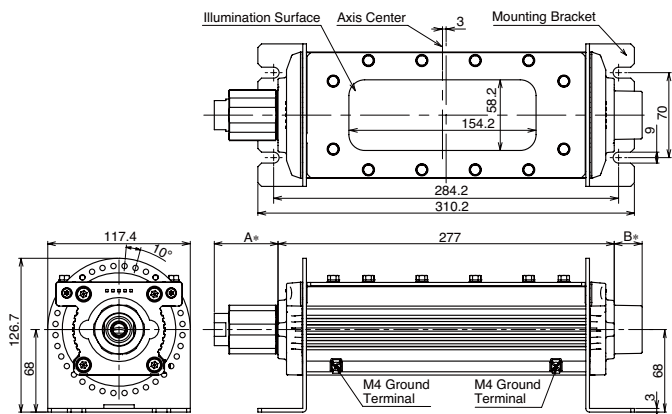
W/Mounting Bracket
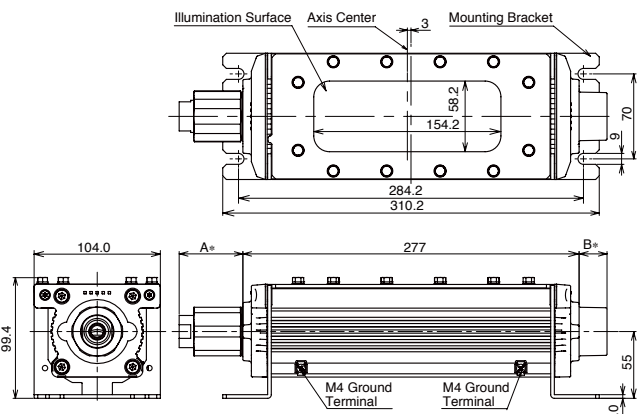
∗ See page 27 for the dimensions of A and B.

All dimensions in mm.

Direct Mounting

Illumination Surface   Axis Center   3

58.2
154.2

A*   277   B*

82
37.5

M4 Ground Terminal   M4 Ground Terminal

150

57

4-M6 Effective thread: 9
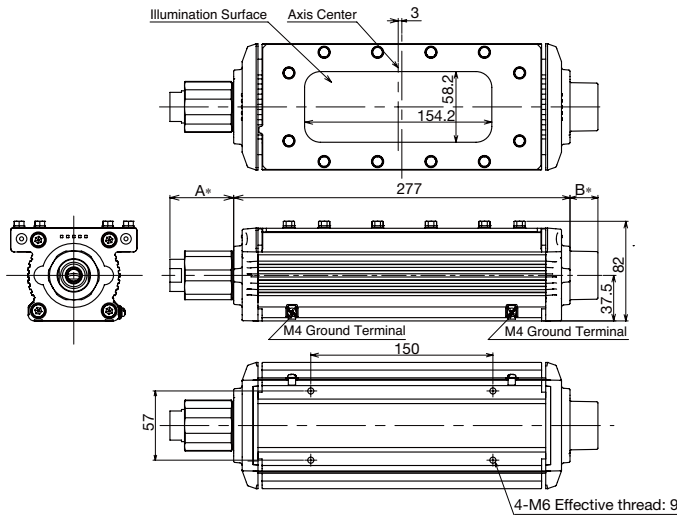
* See below for the dimensions of A and B.

Mounting Hole Layout

Direct Mounting

4-ø6.2
57 ±0.3
150 ±0.4

With Mounting Bracket

4-ø8.2
70 ±0.2
289 ±4
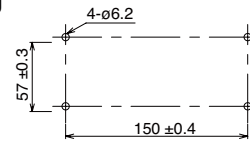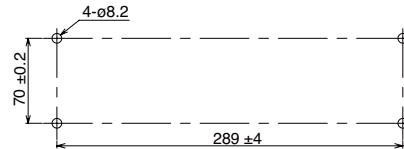
All dimensions in mm.

With Cable Gland: A or B

A/B: 52.5 to 59.5

52.5 to 59.5
øC
ø26.5 (G1/2)
ø31.5 (G3/4)
D

A/B: 53 to 60

53 to 60
øC
D
E

Without Cable Gland: B only

B=23

With ON/OFF Switch: B only

B=23
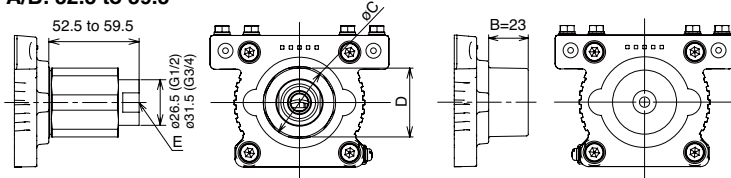
Dimensions (mm)

Cable Gland Code	Applicable Cable Diameter X	Dimensions			Clamp Water-proof
		C	D	E (*)	
10	8 < X ≤ 10	42	40	G1/2 (16)	With
12	10 < X ≤ 12	42	40	G1/2 (16)	
14	12 < X ≤ 14	42	40	G3/4 (22)	
16	14 < X ≤ 16	42	40	G3/4 (22)	
10W	8 < X ≤ 10	30	27	G1/2 (16)	Without
12W	10 < X ≤ 12	30	27	G1/2 (16)	
14W	12 < X ≤ 14	33	30	G3/4 (22)	
16W	14 < X ≤ 16	33	30	G3/4 (22)	

*: Nominal size
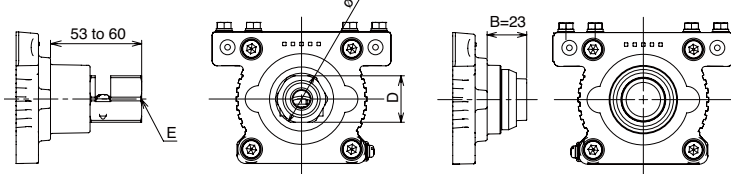
⚠ Safety Precautions

- Do not disassemble, repair, or modify the LED illumination unit. Otherwise electric shock, fire, or malfunction may occur.
- Special expertise is required to install, operate, maintain, and inspect the EF1A. People without such expertise must not use the EF1A. Otherwise electric shocks, damage, or malfunction may result.
- Read this catalog and instruction sheet carefully before using the EF1A.

Instructions

Installation Area

1. Degree of protection for the EF1A is IP67 (with ON/OFF switch: IP65). Do not use in harsher environment.
2. Operating temperature is –20 to +50°C. When the surface temperature of EF1A might exceed +50°C due to direct sunlight, provide a shade to keep the surface temperature below +50°C.
3. When installing the EF1A, observe safety standards and regulations of the relevant country or region.

Installation

1. For direct mounting without mounting bracket, use four M6 bolts. When using mounting brackets, use four M8 bolts or install firmly so that equivalent mounting strength is provided. Mounting bracket is 3 mm thick (see dimensions). Recommended tightening strength is as follows. M6: 3.9 to 5.4 N·m, M8: 10 to 13.5 N·m.
2. If bolt loosening is expected due to vibrations, use spring washers.

Installing/Removing the End Cover

1. When removing the end cover, use a hex key supplied with the EF1A to remove the end cover bolts (M6 × 18 hex socket head cap bolt with spring washer and plain washer). Do not lose the end cover bolts.

2. The end cover is inserted into the housing. When installing the end cover, make sure that the end cover is inserted straight.
3. When installing the end cover, observe the followings.
   · No foreign objects are on the gasket or joint surface.
   · The gasket is in place.
   · The wires are not caught between the joint surfaces.
   Install the end cover slowly and tighten screws to a torque of 3.9 to 5.4 N·m.
Note: Make sure that the bolts are tightened securely.

Drawing a Cable

- Use the flameproof packing type cable gland supplied with the EF1A. Refer to the dimensions. See "Connecting a Cable to the Flameproof Packing Type Cable Gland" for details.
- When choosing a cable, take maximum operating temperature and chemical resistance of insulator and sheath into consideration. The inside of cable must be as solid as possible to prevent ingress of explosive gas through the cable, and smooth on surface and round in cross-section. When choosing the size and insulation material, take the temperature rise of cable into consideration.
- Protect the cable against external damage by encasing in a metal conduit, or in a metal/cement duct.
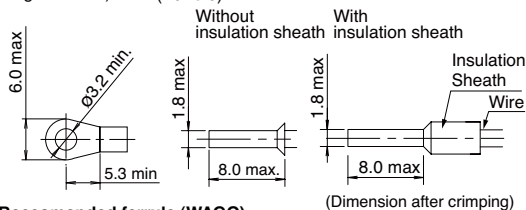
EF1A Flameproof LED Illumination Units

Wiring

Applicable Wire
- Stranded wire: 0.5 to 2.0 mm², Solid wire: ø0.5 to ø2.0 mm² (AWG16-12)
- Connect one wire to one terminal. When connecting an insulated wire to the terminal block, use a crimping terminal with insulation sheath. Bare crimping terminal must be insulated with an insulation tube or making tube. Make sure not to apply excessive force to the terminal block when installing the end cover.

Applicable Crimping Terminal

Screw Terminal (Ring Terminal)

Spring Clamp Terminal (WAGO: 741-302) (Ferrule)

Without insulation sheath

With insulation sheath

6.0 max

ø3.2 min

5.3 min

1.8 max

8.0 max.

1.8 max

8.0 max

Insulation Sheath

Wire

(Dimension after crimping)

Reccomended ferrule (WAGO)
Ferrule with insulation sheath: 216-204
Ferrule without insulation sheath: 216-104
Crimping too: 206-204

Recommended Tightening Torque
- Screw terminal block (M3): 0.5 to 0.8 N·m

Wiring Cable Grand on Both Ends
- A maximum of four EF1A can be connected. Do not connect more than four EF1As, otherwise the input current may exceed the limit.

Protective Grounding
- Ground the EF1A according to the environment and ratings of the application. Observe the regulations of the relevant country or region where the EF1A is used.
- Use the M4 grounding terminal inside the EF1A and make sure that the ground resistance value is under 100Ω.
- When not using the M4 grounding terminal inside the EF1A, use the external M4 grounding terminal.
  Recommended tightening torque (M4): 1.4 to 2.0 N·m.
- Use a wire in size and material which is durable against the maximum expected grounding current. Protect the grounding wire against external damage by encasing in a metal conduit.

Connecting a Cable to the Flameproof Packing Type Cable Gland
- When choosing a cable, take maximum operating temperature and chemical resistance of insulator and sheath into consideration. The inside of cable must be as solid as possible to prevent ingress of explosive gas through the cable, and smooth on surface and round in cross-section. When choosing the size and insulation material, take the temperature rise of cable into consideration.
- Protect the cable against external damage by encasing in a metal conduit, or in a metal/cement duct.

Parts Description

(Part number without W on cable gland)

Gland Set Screw
Gasket
Washer
End Cover
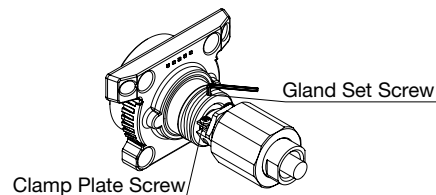Gland
Nut
Ring
Clamp Plate
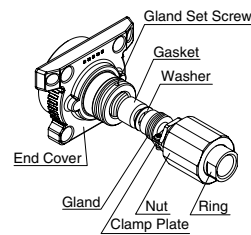
Connecting a Cable
1. Make sure that the cable gland matches the cable diameter. If not, replace the cable. Or replace the EF1A with one that has the cable gland with matching cable diameter.
2. Remove the parts from the end cover in the order of nut, ring, gland, washer, and gasket. The gland can be removed by loosening the gland set screw using the hex key (size 2).
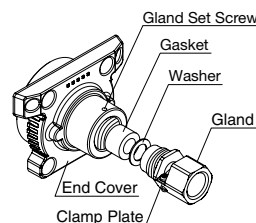
Hex Key (size 2)
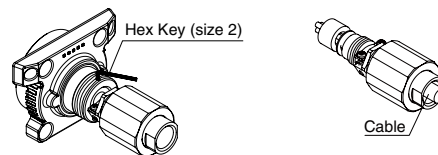
Cable

3. Loosen the clamp plate screws. Pass the cable through the nut, ring, gland, washer, and gasket.
4. Place the gasket and washer in the end cover, and screw in the gland to compress the gasket. Tighten the gland until the cable does not move when pulled out lightly, and tighten further one full turn. If the clamp plate is in the posture which is difficult to be approached by a screwdriver, turn the gland for ±1/3 turn. Tighten the gland set screw. Tighten the clamp plate set screws equally to fixate the cable.

Gland Set Screw

Clamp Plate Screw

5. Screw the nut into the end cover.

(Part number without W on cable gland)
- Connect the cable in the same manner as described above.

Gland Set Screw
Gasket
Washer
Gland
End Cover
Clamp Plate

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(13/02/15)