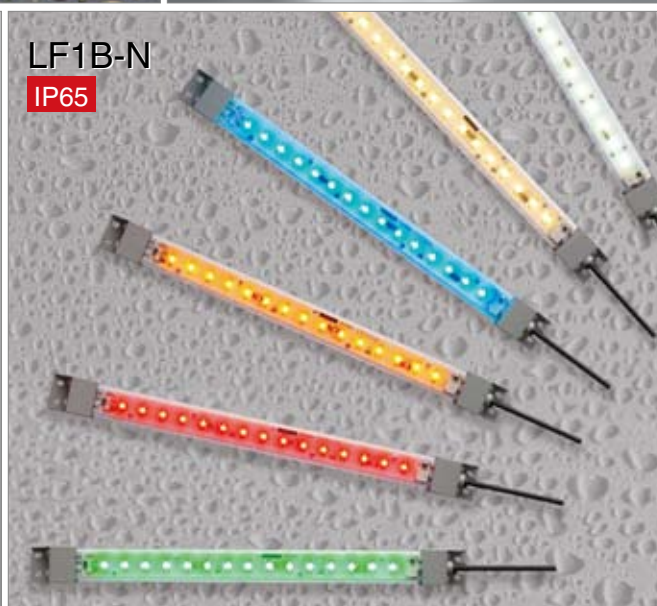
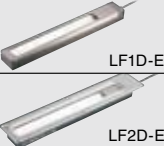
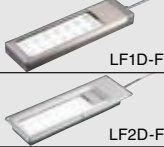

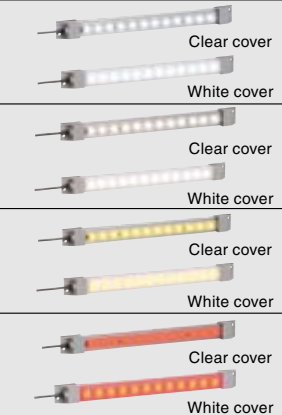
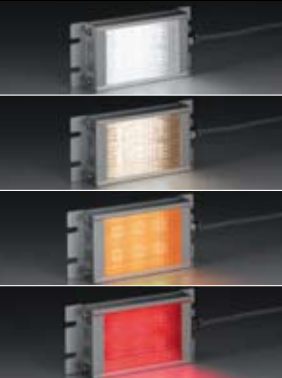




LED Illumination Units



Lineup	Shape	Application Examples	Illumination Color K: Color Temperature (typ.) nm: Dominant Wavelength (typ.)
<p>Robust and resistant housing. Can be used in environments subject to water, dust, and oil.</p> <p>LF1D (Box) LF2D (Flange)</p> <p>Degree of Protection: IP67f / IP67</p>	<p>Slim</p>  <p>LF1D-E LF2D-E</p> <p>Wide</p>  <p>LF1D-F LF2D-F</p>	<p>The optimal light distribution can be achieved by combining the lenses of different distribution angle.</p> <ul style="list-style-type: none"> · Machine Tool · Food processing machines · Test equipment 	White (5,700K)
<p>Thin and slim styles fit into compact spaces. IP65 (waterproof, dustproof). 6 different lengths and 6 distinct colors.</p> <p>LF1B-N</p> <p>Degree of protection: IP65</p>	 <p>Clear cover White cover</p> <p>Clear cover White cover</p> <p>Clear cover White cover</p> <p>Clear cover White cover</p> <p>Clear cover White cover</p> <p>Clear cover White cover</p> <p>Clear cover White cover</p>	<ul style="list-style-type: none"> · Machine tool · Plant equipment · Test equipment · Control panel <ul style="list-style-type: none"> · Food processing machines · Cosmetic plant · Chemical plant · Show cases <ul style="list-style-type: none"> · Semiconductor manufacturing equipment · IC foundry <ul style="list-style-type: none"> · Photographic laboratory · Semiconductor manufacturing equipment · Darkroom experiment <ul style="list-style-type: none"> · Advertising Display · Light ornaments 	<p>White (5,500K)</p> <p>Warm white (2,900K)</p> <p>Yellow (590nm)</p> <p>Red (620nm)</p> <p>Blue (455nm)</p> <p>Green (525nm)</p>
<p>Thin and slim style fits into compact spaces. Resistant against dust and water splash.</p> <p>LF1B</p> <p>Degree of protection: IP54</p>	 <p>Clear cover White cover</p> <p>Clear cover White cover</p> <p>Clear cover White cover</p> <p>Clear cover White cover</p> <p>Clear cover White cover</p>	<ul style="list-style-type: none"> · Control panel · Refrigerator/freezer · Advertising display · Test equipment · Plant equipment · Machine tool <ul style="list-style-type: none"> · Food processing machine · Cosmetic plant · Chemical plant · Showcases · Food display case <ul style="list-style-type: none"> · Semiconductor manufacturing equipment · IC foundry <ul style="list-style-type: none"> · Semiconductor manufacturing equipment · Photographic laboratory · Darkroom experiment 	<p>White (5,500K)</p> <p>Warm white (2,800K)</p> <p>Yellow (590nm)</p> <p>Red (625nm)</p>
<p>LED module and highly efficient heat dissipation technology achieved slim design.</p> <p>LF1A</p> <p>Degree of protection: IP40</p>		<ul style="list-style-type: none"> · Control panel · Machine tool · Plant equipment · Test equipment <ul style="list-style-type: none"> · Food processing machine · Cosmetic plant · Chemical plant <ul style="list-style-type: none"> · Semiconductor manufacturing equipment · IC foundry <ul style="list-style-type: none"> · Semiconductor manufacturing equipment · Photographic laboratory · Darkroom experiment 	<p>White (5,500K)</p> <p>Warm white (2,800K)</p> <p>Yellow (590nm)</p> <p>Red (625nm)</p>
<p>Water, dust, and oil-proof.</p> <p>LF1A</p> <p>Degree of protection: IP67f</p>		<ul style="list-style-type: none"> · Machine tool · Food processing machine · Automotive/Outdoor equipment 	White (5,500K)
<p>Resistant against dust and water. 3 types of light distribution characteristics are available; no-lens, condensing lens, and dual lens.</p> <p>LF1E</p> <p>Degree of protection: IP54</p>		<ul style="list-style-type: none"> · Freezer and refrigerated display case 	<p>White (5,000K)</p> <p>Warm white (3,000K)</p>

Reference Illuminance (typ.)		Size L × W × Hmm	Illumination Surface	Rated Voltage	Power Consumption
Clear Surface: 1,100 lx (directly below at 1.0m) (4,400 lx directly below at 50cm, calculation value)		·LF1D-E 350 × 49.8 × 29.8 ·LF2D-E 389 × 80 × 33.7	Reinforced glass (Note 1) (clear/diffused)	24V DC	Slim: 9W
Diffused surface: 1,000 lx (directly below at 1.0m) (4,000 lx directly below at 50cm, calculation value)		·LF1D-F 270 × 74.7 × 25.9 ·LF2D-F 308 × 105 × 29.8	Polycarbonate (Note 2) (clear/diffused)		Wide: 12.5W
Clear cover	LF1B-NA: 90 lx LF1B-NF: 935 lx (directly below at 50cm)	·LF1B-NA 134 × 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
	LF1B-NA: 60 lx LF1B-NF: 620 lx (directly below at 50cm)	·LF1B-NB 210 × 27.5 × 16			
	LF1B-NA: 20 lx LF1B-NF: 180 lx (directly below at 50cm)	·LF1B-NC 330 × 27.5 × 16 ·LF1B-ND 580 × 27.5 × 16			
	LF1B-NA: 10 lx LF1B-NF: 80 lx (directly below at 50cm)	·LF1B-NE 830 × 27.5 × 16			
	LF1B-NA: 30 lx LF1B-NF: 300 lx (directly below at 50cm)	·LF1B-NF 1,080 × 27.5 × 16			
Clear cover	LF1B-A: 90 lx LF1B-B: 170 lx LF1B-C: 330 lx LF1B-D: 560 lx (directly below at 50cm)	·LF1B-A 134 × 27.5 × 16	Clear cover (polycarbonate) White cover (polycarbonate)	24V DC	LF1B-A: 0.8W LF1B-B: 1.5W LF1B-C: 2.9W LF1B-D: 5.8W
	LF1B-A: 60 lx LF1B-B: 110 lx LF1B-C: 200 lx LF1B-D: 350 lx (directly below at 50cm)	·LF1B-B 210 × 27.5 × 16			
	LF1B-A: 20 lx LF1B-B: 40 lx LF1B-C: 75 lx LF1B-D: 125 lx (directly below at 50cm)	·LF1B-C 330 × 27.5 × 16 ·LF1B-D 580 × 27.5 × 16			
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 Yellow-Red LF1A-A1: 2.2W LF1A-B1: 4.4W LF1A-D1: 8.7W
LF1A-A1: 130 lx LF1A-B1: 260 lx LF1A-D1: 520 lx (directly below at 50cm)					
LF1A-A1: 85 lx LF1A-B1: 170 lx LF1A-D1: 340 lx (directly below at 50cm)					
600 lx (directly below at 50cm)		·LF1A-D2F 247 × 91 × 27	Reinforced glass (clear)	24V DC	7.2W
Condensing lens	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 or Special Power Supply (PH2C-030 -PK660)	24V DC: LF1E-A: 4.2W LF1E-B: 8.4W LF1E-C: 12.6W LF1E-D: 16.8W LF1E-E: 22.8W Special power supply LF1E-A: 4.7W LF1E-B: 9.4W LF1E-C: 14.1W LF1E-D: 18.8W LF1E-E: 23.5W
	LF1E-A: 1,400 lx LF1E-B: 1,500 lx LF1E-C: 1,550 lx LF1E-D: 1,550 lx LF1E-E: 1,550 lx (directly below at 30cm)				

Page 4

Page 8

Page 10

Page 12

Page 13

Page 14

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

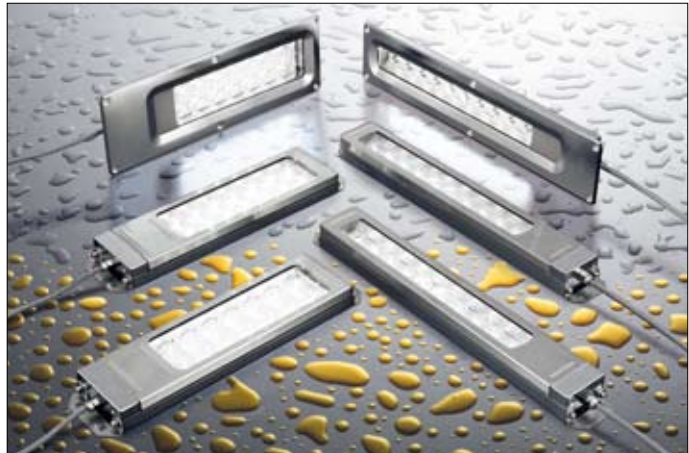
LF1D/LF2D LED Illumination Units

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)
- 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
			LF2D-E2F-2W-200	LF2D-E3G-2W-200	LF2D-F2F-2W-200	LF2D-F3G-2W-200
Without (cable gland hole on the back of LF2D)	—		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 (Side)	With	—	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.

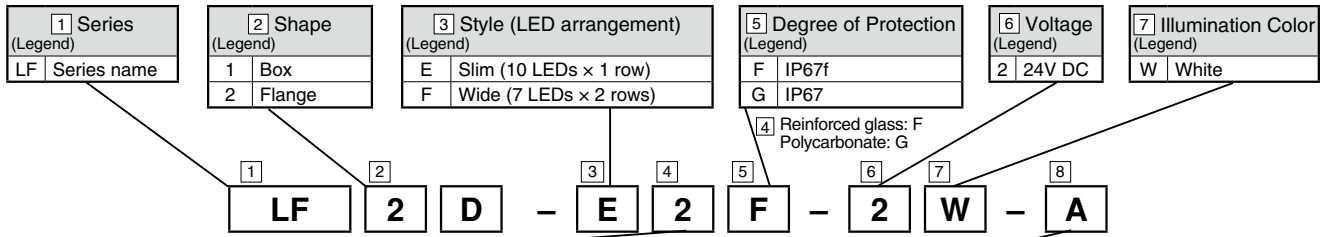
Accessories

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

LF1D/LF2D LED Illumination Units

Part No. Development



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

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

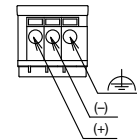
Specifications

Model	LF1D		LF2D	
	Slim	Wide	Slim	Wide
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/s ²			
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-A*: 1000g	LF2D-E**2W*: 850g LF2D-E**2W-A*: 1000g	LF2D-F**2W*: 900g LF2D-F**2W-A*: 1050g

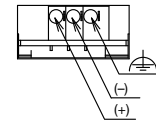
- Note 1: LED life depends on the operating environment.
 Note 2: Waterproof or oil-proof characteristics specified by IEC 60529 and JEM1030.
 For illumination units without accessories, use a cable gland and cable that satisfy IP67f or IP67 degree of protection.
 Note 3: The reinforced glass and polycarbonate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

Terminal Block Wiring

Slim



Wide



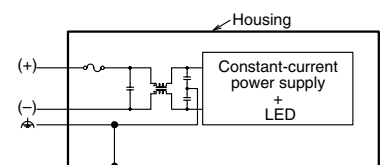
Applicable ferrules: 0.25 to 0.75 mm²
 Recommended source:
 Phoenix Contact:
 AI 0,25-12 BU, AI 0,34-12 TQ,
 AI 0,5-12 WH, AI 0,75-12 GY

LED Optical Specifications

Model	LF1D				LF2D			
	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

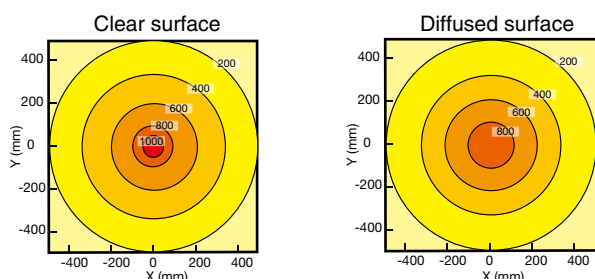
- LED modules and illumination units may vary in illumination color and illuminance.

Internal Circuit

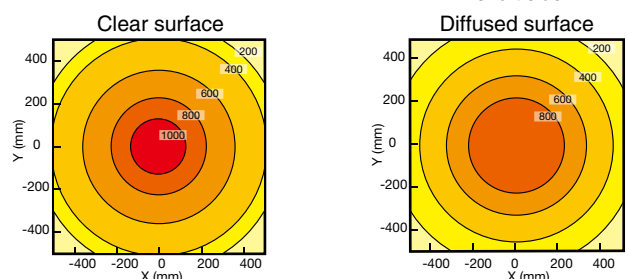


Illuminance Distribution (LF1D/LF2D) at 1.0m

Slim



Wide



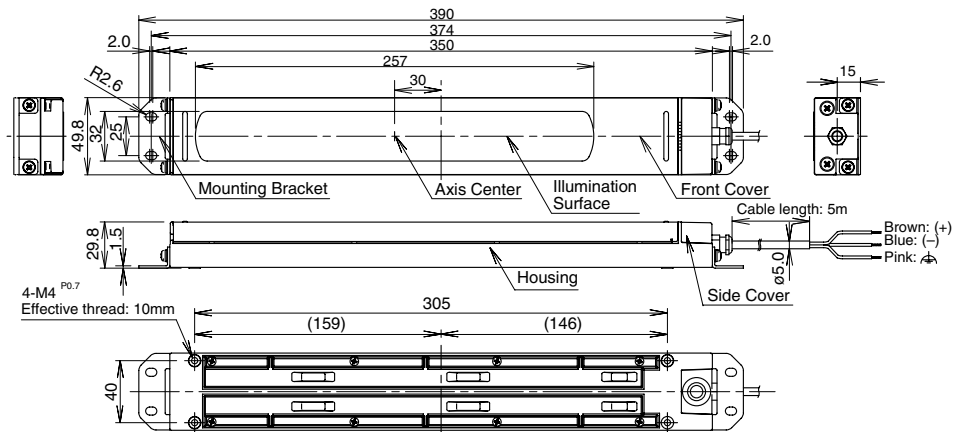
X: long side
Y: short side

LF1D/LF2D LED Illumination Units

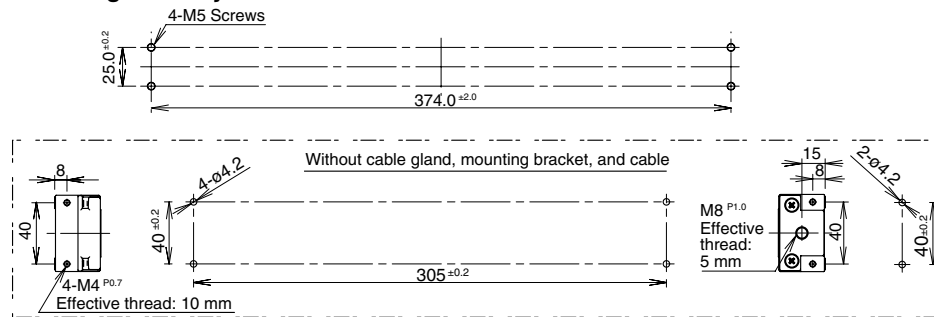
Dimensions

LF1D-E (Slim, 10 LEDs × 1 row)

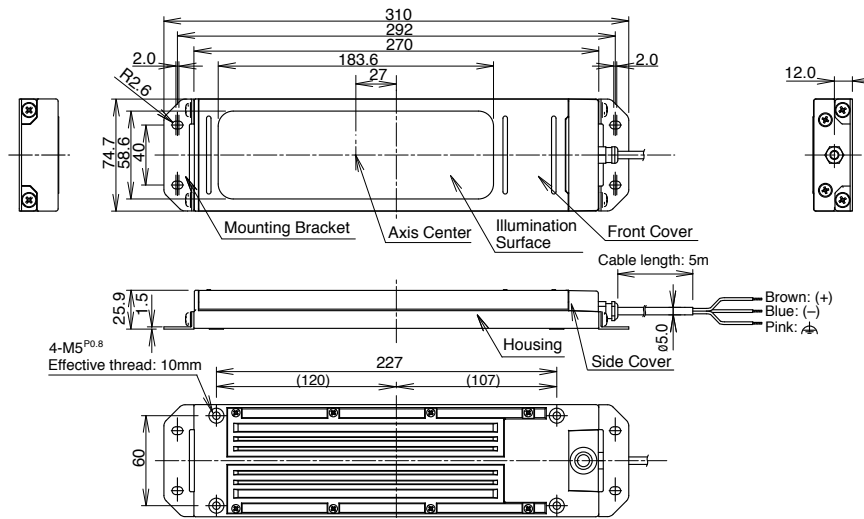
All dimensions in mm.



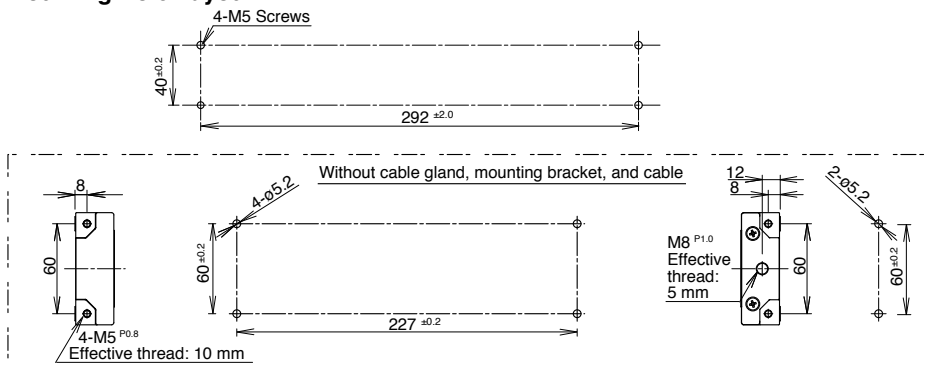
Mounting Hole Layout



LF1D-F (Wide, 7 LEDs × 2 rows)



Mounting Hole Layout

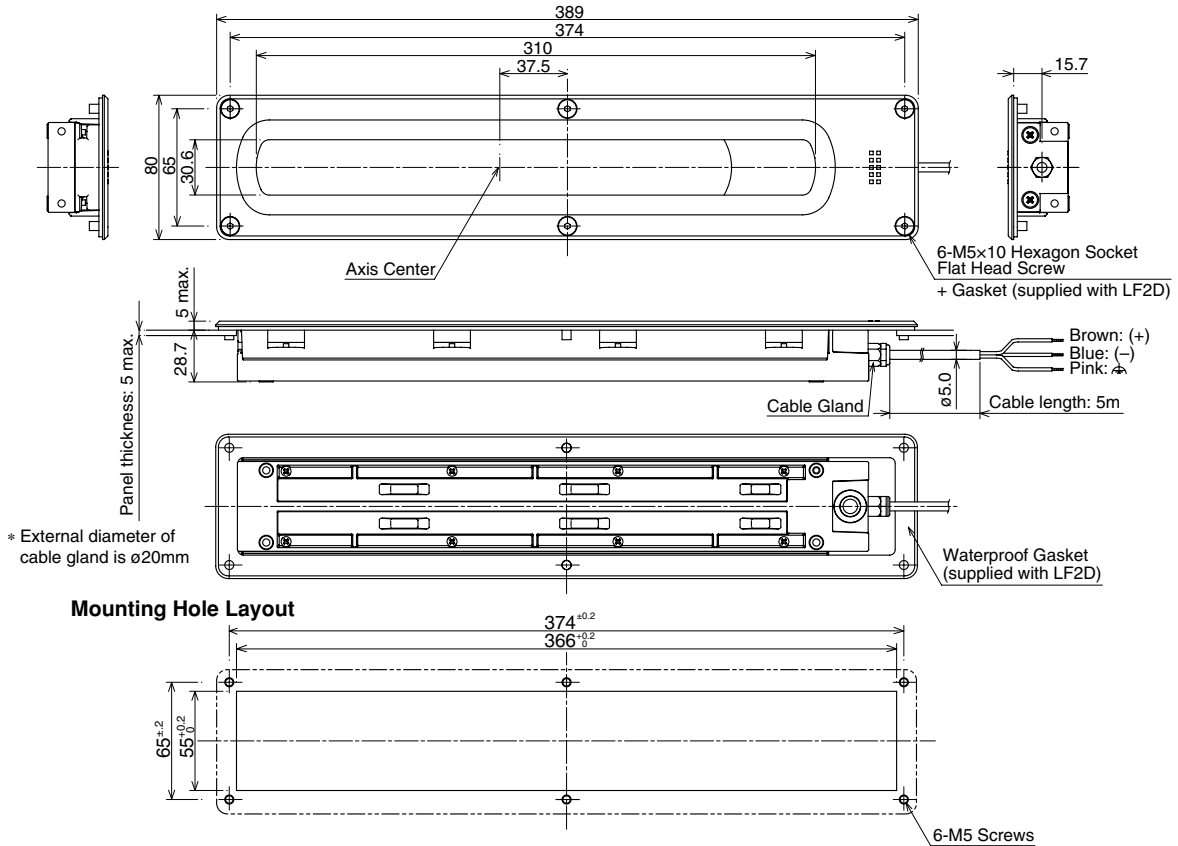


LF1D/LF2D LED Illumination Units

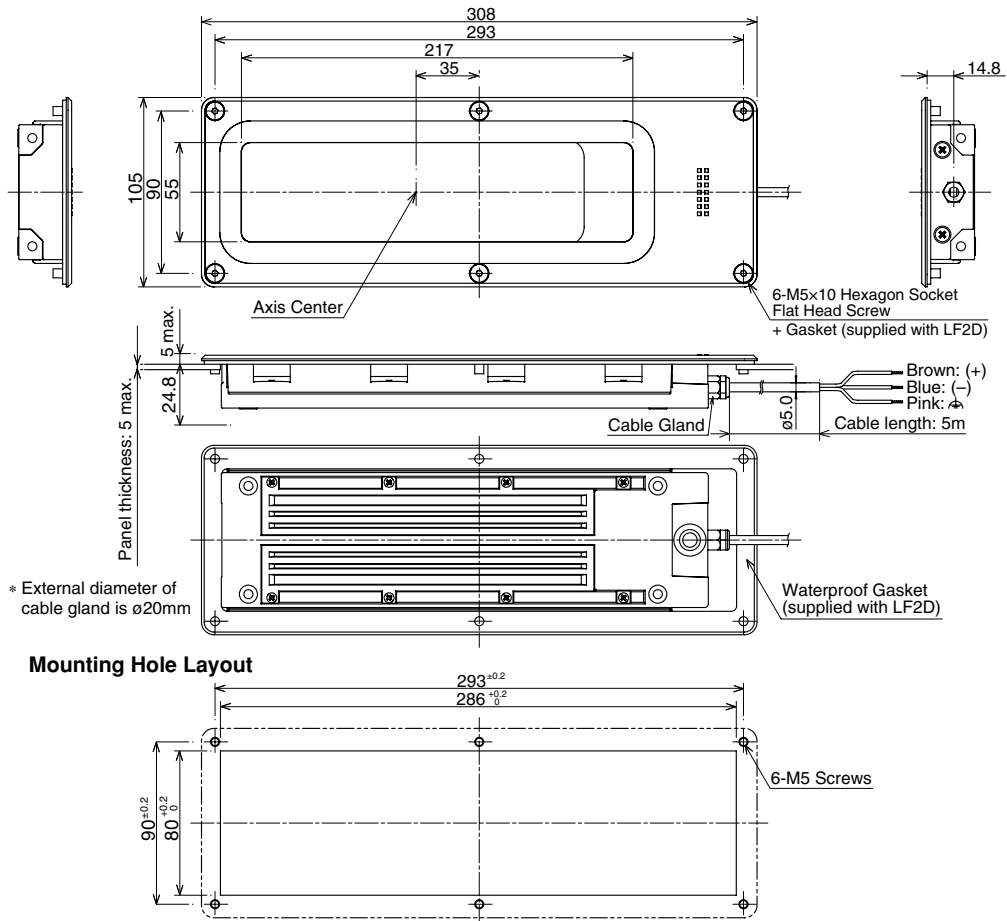
Dimensions

LF2D-E (Slim, 10 LEDs × 1 row)

All dimensions in mm.



LF2D-F (Wide, 7 LEDs × 2 rows)

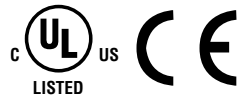


LF1B-N LED Illumination Units

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.



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		<ul style="list-style-type: none"> • Machine tools • Plant equipment • Inspection/test equipment • Control panel 	<ul style="list-style-type: none"> • Food processing machines • Cosmetic plants • Chemical plants • Showcases 	<ul style="list-style-type: none"> • Semiconductor manufacturing equipment • IC foundries 	<ul style="list-style-type: none"> • Photographic laboratory • Semiconductor manufacturing equipment • Darkroom experiment 	<ul style="list-style-type: none"> • Advertising Display • Light ornaments 	

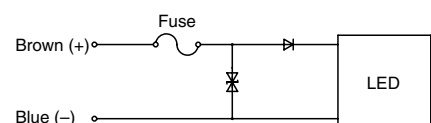
- Specify cable length in place of * in Part No. 1M: 1m, 3M: 3m
- Use Class 2 power supply when using the LF1B-N as UL/c-UL listed LED illumination unit.

Part No. Development

LF1B - NC3P - 2THWW2 - 1M

Length	Cover	Illumination color	Cable length
A: 134mm B: 210mm C: 330mm D: 580mm E: 830mm F: 1,080mm	3: Clear 4: White	THWW2: White TLWW2: Warm white SHY2: Yellow SHR2: Red THS2: Blue SHG2: Green	1M: 1m 3M: 3m

Internal Circuit



LF1B-N LED Illumination Units

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/s ² , 2 hours each in 3 axes				Frequency: 5 to 55 Hz, Amplitude 0.17mm Acceleration 20m/s ² , 2 hours each in 3 axes	
		1,000m/s ² , 5 shocks each in 6 axes				300m/s ² , 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

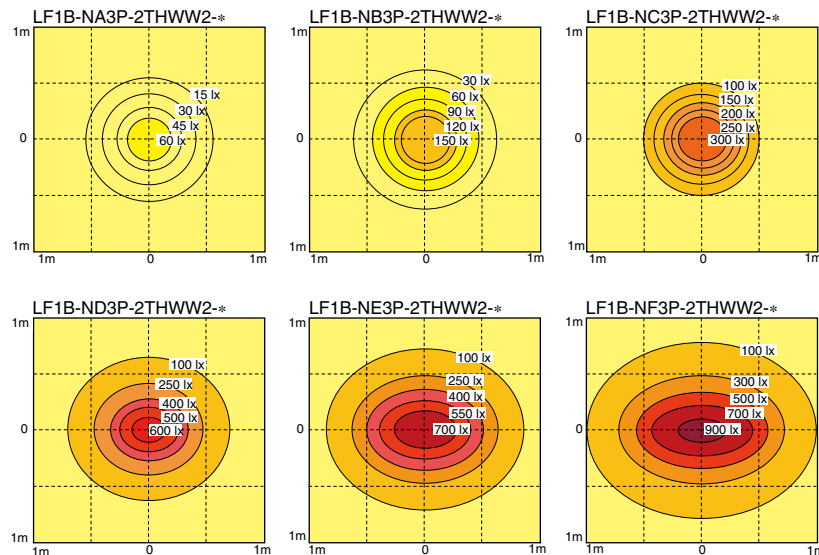
Note: LED life depends on the operating environment.

LED Optical Specifications

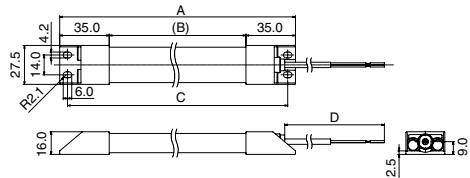
Color Temperature/ Dominant Wavelength (typ.)	White	Warm White	Yellow	Red	Green	Blue	
	5,500K	2,900K	590nm	620nm	525nm	455nm	
Reference Illuminance (typ.) at 0.5m directly below	LF1B-NA	Clear: 90 lx White: 80 lx	Clear: 60 lx White: 55 lx	Clear: 20 lx White: 18 lx	Clear: 20 lx White: 18 lx	Clear: 30 lx 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)



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

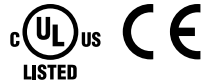
Model	D
LF1B-N*-2*-1M	1,000
LF1B-N*-2*-3M	3,000

All dimensions in mm.

LF1B LED Illumination Units

**Thin and slim style fits into compact spaces.
IP54 protection.**

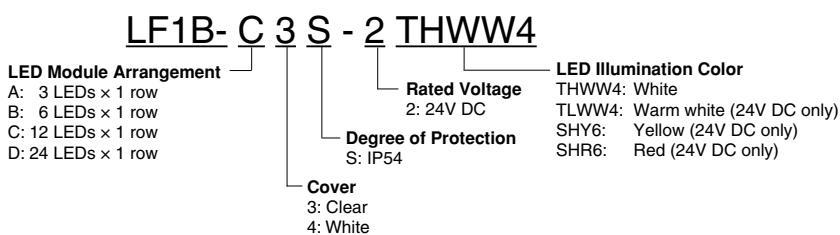
- Small heat generation.
- Less energy usage, longer operation life, smaller mounting space, and no electrical noise.
- 71% reduction of power and CO₂ emission when compared to 20W fluorescent lamps (LF1B-C/D)
- Thin and slim style fits into compact spaces.
- Two cover colors: transparent and white (diffused light)
- White, warm white, yellow and red illumination colors available.
- IP54 protection against dust and water splash (IEC 60529)



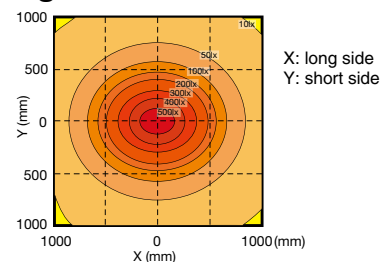
Illumination Color		White	Warm White	Yellow	Red
Power Voltage		24V DC			
Shape	Clear Cover				
	White Cover				
Spectrum					
Features		Suppressing glare, the bright, clear white illumination color lights up a target object clearly. This illumination color gives off a color temperature of 5500K.	Warm color similar to that of incandescent lamps. 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.	Red illumination color gives off an emission spectrum with a dominant wavelength of 625 nm.
3 LED × 1 column	Clear cover	LF1B-A3S-2THWW4	LF1B-A3S-2TLWW4	LF1B-A3S-2SHY6	LF1B-A3S-2SHR6
	White cover	LF1B-A4S-2THWW4	LF1B-A4S-2TLWW4	LF1B-A4S-2SHY6	LF1B-A4S-2SHR6
6 LED × 1 column	Clear cover	LF1B-B3S-2THWW4	LF1B-B3S-2TLWW4	LF1B-B3S-2SHY6	LF1B-B3S-2SHR6
	White cover	LF1B-B4S-2THWW4	LF1B-B4S-2TLWW4	LF1B-B4S-2SHY6	LF1B-B4S-2SHR6
12 LED × 1 column	Clear cover	LF1B-C3S-2THWW4	LF1B-C3S-2TLWW4	LF1B-C3S-2SHY6	LF1B-C3S-2SHR6
	White cover	LF1B-C4S-2THWW4	LF1B-C4S-2TLWW4	LF1B-C4S-2SHY6	LF1B-C4S-2SHR6
24 LED × 1 column	Clear cover	LF1B-D3S-2THWW4	LF1B-D3S-2TLWW4	LF1B-D3S-2SHY6	LF1B-D3S-2SHR6
	White cover	LF1B-D4S-2THWW4	LF1B-D4S-2TLWW4	LF1B-D4S-2SHY6	LF1B-D4S-2SHR6
Applications		<ul style="list-style-type: none"> • Control panel • Plant equipment • Refrigerator/freezer • Inspection/test equipment • Advertising display • Machine tool 	<ul style="list-style-type: none"> • Food processing machines • Cosmetic plants • Chemical plants • Showcases • Food display cases 	<ul style="list-style-type: none"> • Manufacturing equipment • IC foundries 	<ul style="list-style-type: none"> • Photographic laboratory • Semiconductor manufacturing equipment • Darkroom experiment

• Use Class 2 power supply when using the LF1B as UL/c-UL listed LED illumination unit.

Part No. Development



Light Distribution



24 LEDs x 1 column, clear cover, white

LF1B LED Illumination Units

Specifications

Rated Voltage	24V DC (non-polarized)	
Input Current (typ.) (at the rated voltage)	LF1B-A	30 mA
	LF1B-B	60 mA
	LF1B-C	120 mA
	LF1B-D	240 mA
Power Consumption (typ.) (at the rated voltage)	LF1B-A	0.8W
	LF1B-B	1.5W
	LF1B-C	2.9W
	LF1B-D	5.8W
Insulation Resistance	100 MΩ minimum (500V DC megger)	
Dielectric Strength	1000V AC, 1 minute (between live and dead parts)	
Vibration Resistance (damage limits)	Frequency: 5 to 55 Hz Amplitude: 0.5 mm	
Shock Resistance (damage limits)	1000 m/s ²	
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	40000 hours (The total illumination duration in which the luminance maintains a minimum of 70% of the initial value.)	
Degree of Protection	IP54	
Material	End cover, conduit: polyamide Cover: polycarbonate Wire: US20276T AWG24 × 2C	
Weight (approx.)	LF1B-A	95g
	LF1B-B	125g
	LF1B-C	165g
	LF1B-D	255g

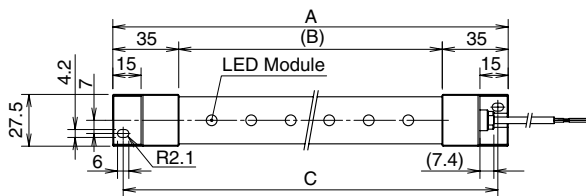
• Do not use the LF1B illumination units in environment subject to corrosive gases, otherwise illuminance may deteriorate.

LED Optical Specifications

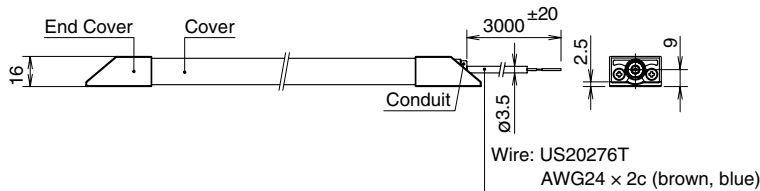
Illumination Color	White	Warm White	Yellow	Red
Luminous Intensity (typ.) (Single LED module)	5000 mcd	4500 mcd	2300 mcd	1800 mcd
Color Temperature (typ.)/Dominant Wavelength (typ.)	5500K	2800K	590 nm	625 nm
Reference Illuminance (typ.) at 500 mm (clear cover)	3 LEDs × 1 row	90 lx	20 lx	20 lx
	6 LEDs × 1 row	170 lx	110 lx	40 lx
	12 LEDs × 1 row	330 lx	200 lx	75 lx
	24 LEDs × 1 row	560 lx	350 lx	125 lx

Note: LED modules and illumination units may vary in illumination colors and illuminance. Luminous intensity, color temperature, and illuminance shown in the above table are typical values.

Dimensions

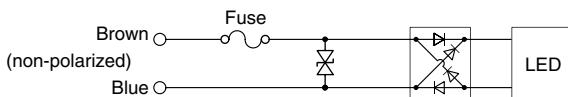


Model	A	B	C
LF1B-A	134	64	123
LF1B-B	210	140	199
LF1B-C	330	260	319
LF1B-D	580	510	569



All dimensions in mm.

Internal Circuit



LF1A LED Illumination Units

Standard

- 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.



LED Illumination Units

Illumination Color		White	Warm White	Yellow	Red
Part No.	3 LEDs x 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 x 2 columns	LF1A-D1-2THWW6*	LF1A-D1-2TLWW6*	LF1A-D1-2SHY8*	LF1A-D1-2SHR8*
Shape					
Spectrum					
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	<ul style="list-style-type: none"> • Machine Tools • Control Panel/Plant Equipment • Inspection/Test Equipment 		<ul style="list-style-type: none"> • Food Processing Machines • Cosmetic Plants • Chemical Plants 	<ul style="list-style-type: none"> • Semiconductor Manufacturing Equipment • IC Plants 	<ul style="list-style-type: none"> • 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/s ²		
Shock Resistance (Damage Limits)	980m/s ²		
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-FLEX100T AWG22)		

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

Part No. Development

LF1A- A1 - 2 THWW6

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

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

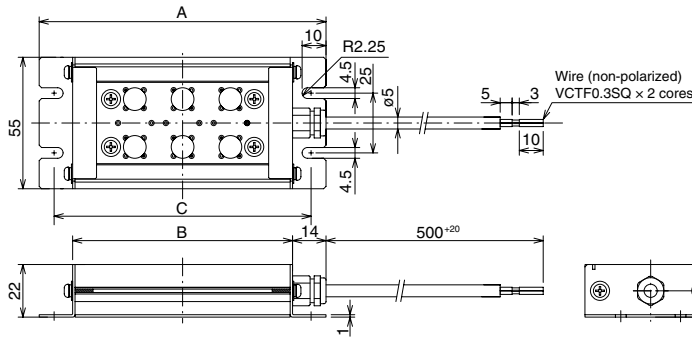
LED Optical Specifications

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 Illumination (typ.) at 50 cm	3 LEDs x 2 rows	190 lx	130 lx	85 lx
	6 LEDs x 2 rows	380 lx	260 lx	170 lx
	12 LEDs x 2 rows	760 lx	520 lx	340 lx

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

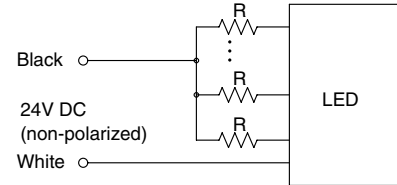
LF1A LED Illumination Units

Dimensions



Model	A	B	C
LF1A-A1-*	120	92	108
LF1A-B1-*	180	152	168
LF1A-D1-*	300	272	288

Internal Circuit



All dimensions in mm.

Water-, Dust-, and Oil-Proof

- Water-proof, dust-proof, oil-proof (IP67) that uses special rubber (fluorinated elastomer) for internal waterproof gasket.
- Can be used on a food processing line to be washed as a whole, or in a machine tool where the unit may be splashed with oil.
- With the highly bright multi-chip LED modules, the LF1A series provides illumination equivalent to a 20W fluorescent lamp.
- The front housing panel is made of SUS304, ensuring high strength and corrosion resistance.
- Equipped with a standard accessory 5-m cable (metal protection tube can be mounted)

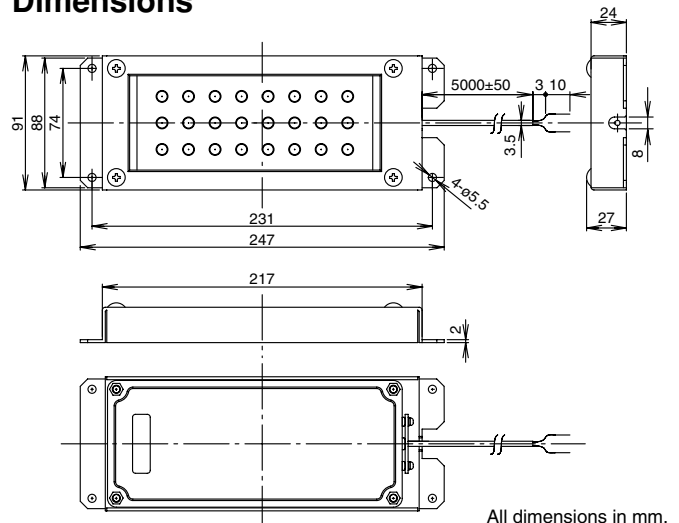


illumination Color	White
8 LEDs x 3 rows	LF1A-D2F-2THWW6

Specifications

Rated Voltage	24V DC (non-polarized)
Input Current (typ.)	300 mA (at rated voltage)
Rated Power (typ.)	7.2W (at rated voltage)
Operating Temperature	-20 to +50°C
Storage Temperature	-25 to +70°C
Operating/Storage Humidity	45 to 85% RH (no condensation)
Life (half luminance)	40,000 hours
Insulation Resistance	100 MΩ minimum (500V DC megger)
Dielectric Strength	1000V AC, 1 minute (between live and dead parts)
Vibration Resistance (damage limits)	5 to 55 Hz, amplitude 0.5 mm, 20 m/s ²
Shock Resistance (damage limits)	980 m/s ²
Material	Housing: SUS, Glass: Reinforced glass Rear panel: Aluminum Electric wire: US20276T 0.2 mm ² x 2c
Weight (approx.)	850g
Degree of Protection	IP67f

Dimensions



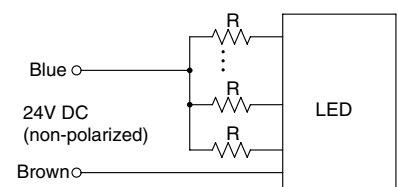
All dimensions in mm.

LED Optical Specifications

illumination Color	White
Chromaticity Coordinate Value (typ.)	X: 0.33, Y: 0.33
Luminous Intensity (typ.) (Single LED module)	6000 mcd
Color Temperature (typ.)	5500K
Reference Illuminance (typ.) at 500 mm	600 lx

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

Internal Circuit



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.
- Dimmer control for adjusting brightness and saving energy is possible by using special power supply type (PH2C-030-PK660 supplied separately).



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)	24V DC	4.2W	8.4W	12.6W	16.8W	22.8W
	Special Power Supply	4.7W	9.4W	14.1W	18.8W	23.5W
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 Cable: PVC		Cover: polycarbonate Mounting bracket: stainless steel			

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

Note 2: Dual lens

- Use PH2C-030-PK660 power supply for the dimmable special power supply type (PH2C-030-PK660 is not UL approved or CE marked).
- For 24V DC type, use Class 2 power supply when using the LF1E as UL/c-UL listed LED illumination unit.

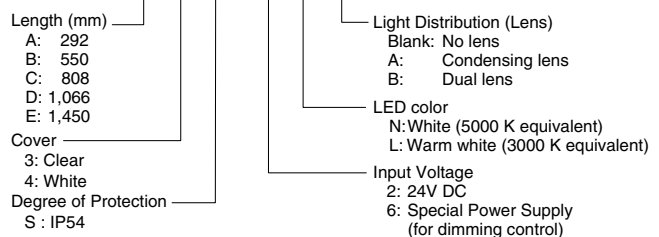
LED Optical Specifications (clear lens)

Illumination Color		White	Warm white	
Color Temperature (typ.)		5000K	3000K	
Reference Illuminance (typ.) (Measured at 0.3m directly below the unit)	Lens	Unit Length	Illuminance	
			No-lens (Note)	292 mm
	550 mm	950 lx		750 lx
	808 mm	1100 lx		900 lx
	1066 mm	1200 lx		950 lx
	Condensing Lens (Note)	1450 mm	1250 lx	1000 lx
		292 mm	1800 lx	1400 lx
		550 mm	1950 lx	1500 lx
		808 mm	2000 lx	1550 lx
	Dual Lens	1066 mm	2000 lx	1550 lx
1450 mm		2000 lx	1550 lx	
Dual Lens			See the illuminance distribution chart on page 15.	

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

Part No. Development

LF1E - B 3 S - 2 N A



Accessories

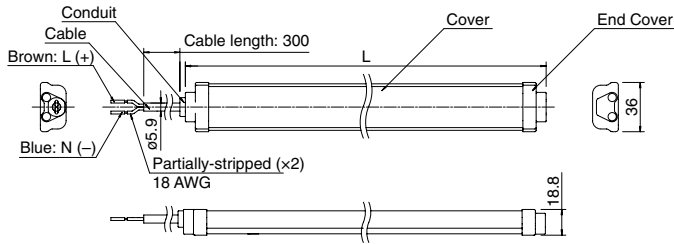
Item	Part No.	Package Quantity
Mounting Bracket	LF9Z-1SE1PN05	5

- 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 17 for dimensions.

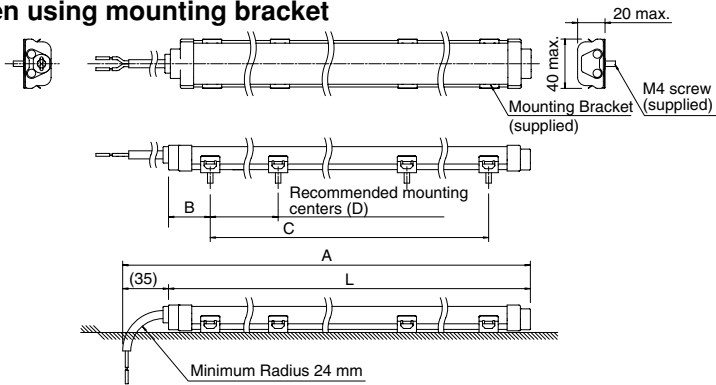
LF1E LED Illumination Units

Dimensions

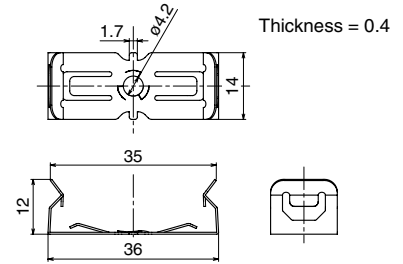
LF1E Illumination Unit



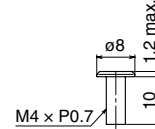
When using mounting bracket



Mounting Bracket (supplied) (LF9Z-1SE1)

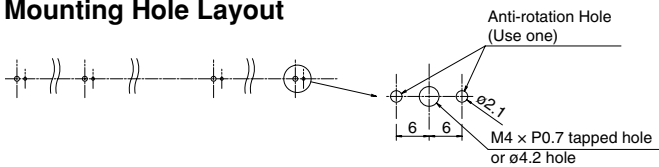


Mounting Screw (supplied)



All dimensions in mm.

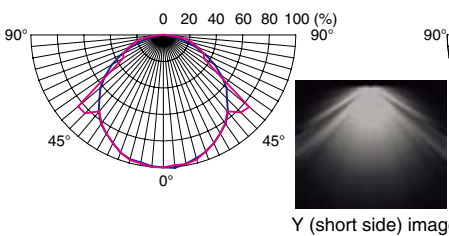
Mounting Hole Layout



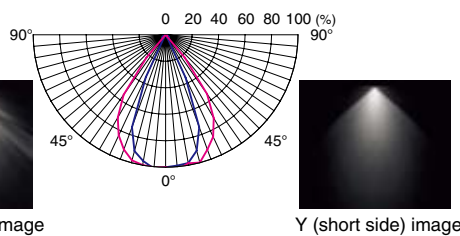
Model	L	A	B	C	D	No. of Mounting Brackets
LF1E-A	292	327	36	220	220	2
LF1E-B	550	585	30	490	490	2
LF1E-C	808	843	29	750	375	3
LF1E-D	1066	1101	30.5	1005	335	4
LF1E-E	1450	1485	32	1386	462	4

Illuminance Distribution Chart

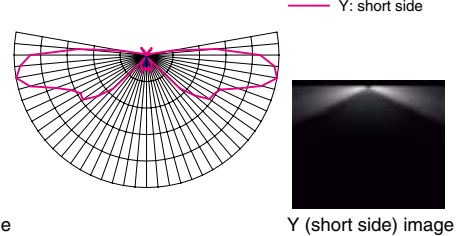
No-lens



Condensing Lens

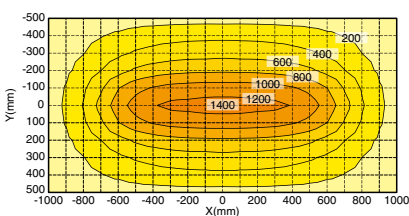


Dual Lens

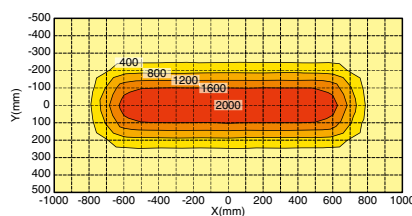


Illumination Chart (reference value of 5000K at 0.3m. Dual lens type at 50 mm.)

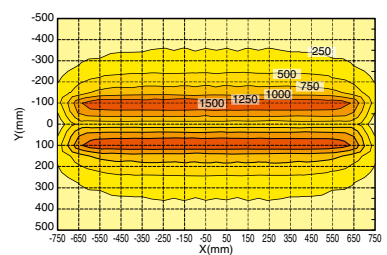
No-lens (LF1E-E3S-2N)



Condensing Lens (LF1E-E3S-2NA)



Dual Lens (LF1E-E3S-2NB)



PH2C-030-PK660 Constant-current Power Supply

Power Supply for LF1E LED Illumination Units

- Constant-current power supply
- LED dimmer function with external signals
- Universal AC inputs (85 to 264V AC)
- Finger-safe terminals
- Harmonic current regulated
- Compliant with electrical Appliance and Material Safety Law (Article 1)



Package quantity: 1

Part No.	Input Voltage	Output Voltage (Maximum)	Output Current (Maximum)	Inrush Current Limited	Dimming Function	Harmonic Current
PH2C-030-PK660	100 to 240V AC (Voltage range: 85 to 264V AC)	30V	875 mA	Yes	Yes	Compliant

Specifications

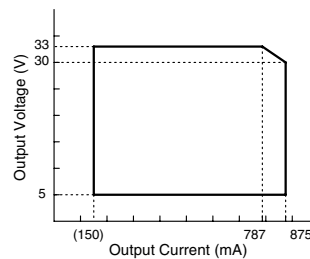
Input	Input Voltage (Single-phase two-wire)	100 to 240V AC (Voltage range: 85 to 264V AC)	
	Frequency	47 to 63 Hz	
	Input Current	0.33A typ. (100V AC)	
	Inrush Current (with suppression)	5A max. (100V AC)	
	Efficiency	80%	
	Power Factor	0.99 typ. (100V AC) 0.95 typ. (200V AC)	
Output	Maximum Output Capacity	26.25W	
	Maximum Output Voltage (no load)	33V typ.	
	Output Voltage Stability	±10%	
	Constant Current	Maximum Output Current	875 mA
		Stability	±5%
Output Current Adjustment	Approx. 0 to 875 mA (Note 1)		
Supply-mentary Functions	Output Short-circuit Protection	Yes	
	Overvoltage Protection	Output off at 120% (Note 2)	
	Operation Indicator	No	
Dielectric Strength	Between input and output terminal	3000V AC, 1 minute	
	Between input terminal and housing	2000V AC, 1 minute	
	Between output terminal and housing	500V AC, 1 minute	
Insulation Resistance (between input and output, between input and housing)		100 MΩ minimum (500V DC megger)	
Dimensions (mm)		50W × 240D × 48H	
Weight (approx.)		440g	
Terminal Style		Finger-safe	
Terminal Wire (AWG20 to 16)		Solid wire: ø0.8 to 1.2 mm Stranded wire: 0.5 mm ² to 1.25 mm ²	
Operating Temperature		0 to 50°C (with derating)	
Storage Temperature		-10 to +75°C (no freezing)	
Ambient Temperature		20 to 90% RH (no condensation)	

Note 1: Output current adjustable range of dimming control. The current will not reduce to zero even if set to 0A.

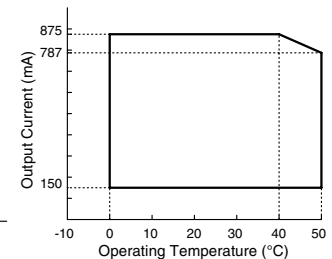
Note 2: One minute after the output has been turned off, turn on the input again.

Characteristics

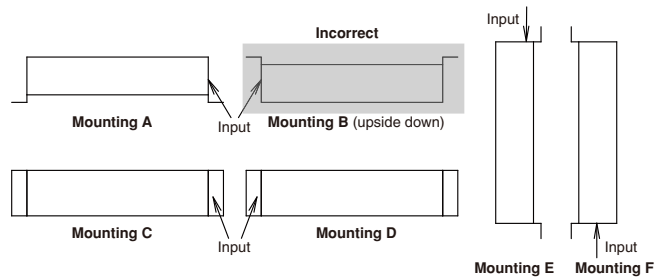
Output Voltage vs. Output Current



Output Current vs. Operating Temperature (Derating Curves)



Installation

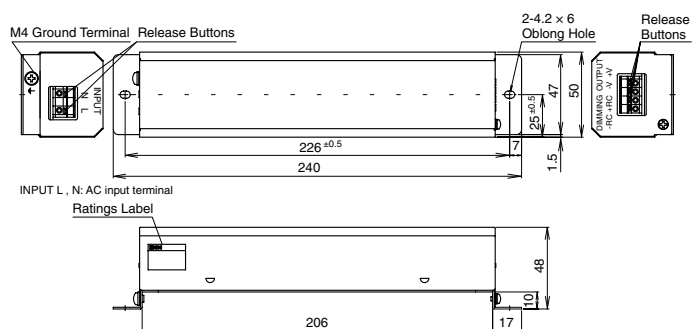


Legends

Mark	Description	Remarks
—	Release button	Press when inserting/removing the wire.
INPUT	AC input terminal	L: fuse, N: ground
OUTPUT	Output terminal	+V: LED anode -V: LED cathode
⊕	Ground terminal	Use M4 ring terminal.
DIMMING	For external voltage dimming	+RC: +V side -RC: -V (GND) side

Dimensions

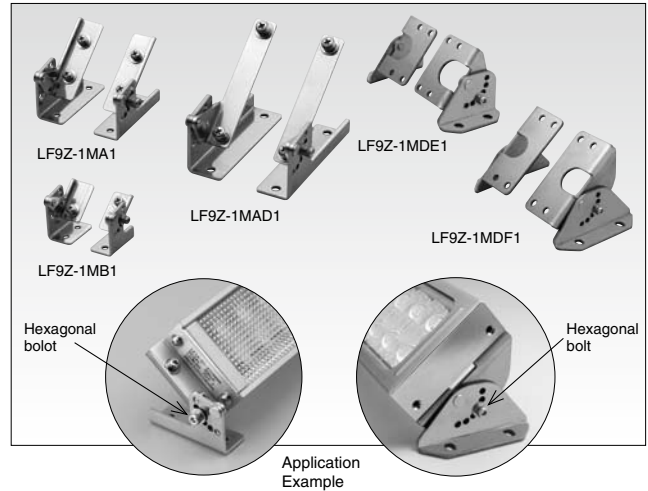
All dimensions in mm.



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.

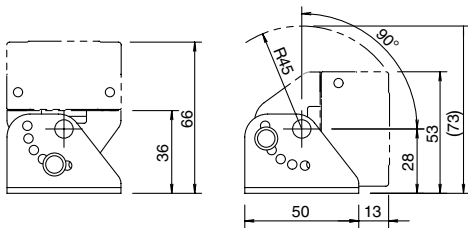


Adjustable Angle Mounting Bracket

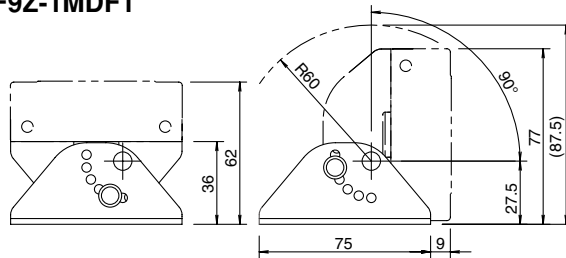
Adjustable Angle Mounting Bracket for LF1D/LF1B/LF1A	Part No.	Applicable LED Illumination Unit	Material	Package Quantity
	LF9Z-1MDE1	LF1D-E	Stainless Steel	1 pair (right and left) (mounting screws supplied)
	LF9Z-1MDF1	LF1D-F		
	LF9Z-1MB1	LF1B-A, -B, -C (not -D)		
	LF9Z-1MA1	LF1A-A, -B, -D		
	LF9Z-1MAD1	LF1A-D2F		

Dimensions

LF9Z-1MDE1



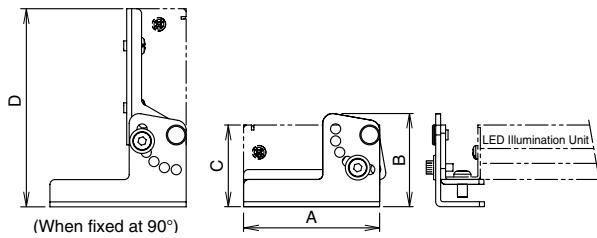
LF9Z-1MDF1



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

All dimensions in mm.

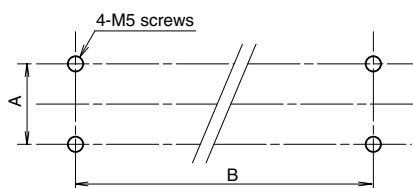
LF9Z-1MB1/MA1/MAD1



- The above dimensions are for LF9Z-1MA1.

Part No.	A	B	C	D
LF9Z-1MB1	27.5	35.2	27	50.5
LF9Z-1MA1	55	37.9	33	80
LF9Z-1MAD1	88	43.2	37	121

Mounting Hole Layout



Part No.	E	F	G
LF9Z-1MDE1	25 ± 0.2	374 ± 2.0	4-M5
LF9Z-1MDF1	40 ± 0.2	292 $\begin{smallmatrix} +4.0 \\ -2.0 \end{smallmatrix}$	4-M5
LF9Z-1MB1	14	(Note)	4-M4
LF9Z-1MA1	25	(Note)	4-M4
LF9Z-1MAD1	74	231	4-M5

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 illumination.
- 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.

PH2C-030-PK660 Constant-current power supply

External Signals

- Output current can be controlled by an external signal input (0V to 5V).
- Output current is 100% with 0V input signal, and 0% with 5V input signal voltage. Output current decreases as external signal voltage increases. Note that the relation between external signal and output current depends on the load and operation conditions.
- Do not apply more than 5V DC as the external signal input, otherwise the PH2C power supply may become damaged.
- Voltage of 1V max. is generated in the external signal terminal, and it is normal.
- When not using external signals, short the terminals. Otherwise the output will reduce to less than the rated current.
- Observe proper polarity (+, -) when wiring, otherwise overcurrent may damage the LED illumination unit and PH2C power supply.



Safety Precautions

- The PH2C power supply is for general-purpose industrial electric devices such as industrial, office, and information processing equipment. Do not use the PH2C power supply for electronic equipment which may damage the human body or threaten life in case a malfunction or failure occurs.
- Observe the rated voltage and output current, otherwise an electric shock, fire, or failure will result.
- Provide the final product with protection against malfunction or damage that may be caused by the malfunction of the power supply.
- Operating temperatures should not exceed their ratings. Note the derating characteristics. If the operating temperature exceeds these ratings, electric shock, fire, or malfunction may occur.
- Blown fuses indicate that the internal circuits are damaged. Contact IDEC for repair. Do not replace the fuse and reoperate, otherwise electric shock, fire, or malfunction may occur.
- Do not use these power supplies to charge rechargeable batteries.
- Connect all output terminals on the pin terminal type, otherwise fire may occur.
- Turn power off before wiring the power supply.
- Observe the proper polarity (+, -) when wiring.
- When turning inputs on and off while setting the output current of an external signal dimmer to zero, the LED illumination unit may be lit.

Instructions

- The PH2C power supply is for indoor use only and is not protected against water, dust, or moisture.
- Turn off the power before wiring or installing/removing LED illumination unit.
- Make sure not to introduce overcurrent to the LED illumination unit.
- Do not open the cover, or touch inside of the power supply. Do not repair, modify, or adjust the power supply.
- Make sure that no foreign or metal objects enter the power supply.
- When using the power supply with general-purpose illumination units, ask an electrical technician for wiring and installation.
- Use IDEC's LF1E LED illumination unit for LED illumination unit.
- One PH2C power supply can connect to one LED illumination unit only.
- For installing the PH2C power supply, use M4 screws (tightening torque: 1.3 to 1.7 N·m).
- Electrolytic zinc-coated steel sheet is used for the housing. Due to the material characteristics, the PH2C power supply may develop scratches on the surface or rust on the edge, depending on the storage condition.

Overvoltage Protection

The output is turned off when an overvoltage is applied to the input. When the output voltage has dropped due to an overvoltage, turn the input off, and after one minute, turn the input on again.

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



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