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Lumifa



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Selection Guide

					Application Examples	Illumination Color ¹	Reference Illumination ²	Power Consumption	Operating Voltage	Page
LF1D/2D	Mini	LF1D-C (IP67F/IP67/IP69K)			· Machine tools · Food processing machines · Automatic manufacturing machines · Printing machines · Production system · Test equipment	White (5700K)	180lx	4.6W	24V DC	page 4
		Slim	LF1D/2D Wide-angle and High Luminance (IP67F/IP67/IP69K)		· Machine tools · Food processing machines · Automatic manufacturing machines · Printing machines · Production system · Test equipment	White (5700K)	1450lx	11W	24V DC	
							1200lx	12.5W		
		Wide		Neutral White (4700K) ³			560lx	18.4W	24V DC	
							840lx	27.6W		
	Long	LF1D-H (IP67F/IP67/IP69K)		· Machine tools · Food processing machines · Automatic manufacturing machines · Printing machines · Production system · Test equipment	Neutral White (4700K) ³	560lx	18.4W	24V DC		
LF1D-J (IP67F/IP67/IP69K)			840lx			27.6W				
LF2B (IP65)		Clear Cover		· Various machines and systems · Control panel · Plant · Solar power equipment	White (6500K)	LF2B-B: 290lx LF2B-C: 540lx LF2B-D: 1065lx LF2B-E: 1385lx LF2B-F: 1520lx	12/24V DC LF2B-B: 2.6W LF2B-C: 4.9W LF2B-D: 10.6W	12/24V DC	page 11	
		White Cover				LF2B-B: 265lx LF2B-C: 500lx LF2B-D: 980lx LF2B-E: 1275lx LF2B-F: 1400lx	100 to 240V AC LF2B-B: 2.2W LF2B-C: 4.4W LF2B-D: 7.8W LF2B-E: 12.2W LF2B-F: 15.9W	100 to 240V AC		

1. K: Color Temperature (typ.), mm: Dominant Wavelength (typ.).

2. Directly below at 1m unless otherwise noted.

3. To match traditional cool fluorescent lamps.

			Application Examples	Illumination Color ¹	Reference Illumination ²	Power Consumption	Operating Voltage	Page
LF1B-N (IP65)	Clear/ White Cover		· Machine tool · Plant equipment · Test equipment · Control panel	Cool white (6500K)	LF1B-NA: 95lx LF1B-NF: 1350lx	Cool 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	24V DC	13
			· Food processing machines · Cosmetic plant · Chemical plant · Show cases	Warm white (3000K)	LF1B-NA:90lx LF1B-NF: 1300lx			
			· Semiconductor manufacturing equipment · IC foundry	Yellow (590nm)	LF1B-NA: 20lx LF1B-NF: 180lx			
			· Photosensitive material · Semiconductor manufacturing equipment · Darkroom experiment	Red (620nm)				
			· Advertising Display · Light ornaments	Blue (455nm)	LF1B-NA: 10lx LF1B-NF: 80lx			
				Green (525nm)	LF1B-NA: 30lx LF1B-NF: 300lx			
LF1A (IP40)	Clear Cover		· Control Panels · Manufacturing Equipment	Cool white (5500K)	LED Array 3x2: 190lx LED Array 6x2: 380lx LED Array 12x2: 760lx	LED Array 3x2: 1.8W LED Array 6x2: 3.6W LED Array 12x2: 7.2W LED Array 3x2: 2.2W LED Array 6x2: 4.4W LED Array 12x2: 8.7W	24V DC	15
				Warm white (2800K)	LED Array 3x2: 130lx LED Array 6x2: 260lx LED Array 12x2: 520lx			
				Yellow (590nm)	LED Array 3x2: 130lx LED Array 6x2: 260lx LED Array 12x2: 520lx			
				Red (625nm)	LED Array 3x2: 85lx LED Array 6x2: 170lx LED Array 12x2: 340lx			
EF1A (IP67 or IP65 with switch)			For Hazardous Locations: · Oil, gas and mining industries · Printing factory · Gas station · Chemical complex control panel	White (5700K)	Clear glass surface: 1,100lx (condensing light) 205lx (diffused light)	19W	100 to 240V AC	17
					Translucent glass: 450lx (condensing light) 175lx (diffused light)	17W	24V DC	

1. K: Color Temperature (typ.), mm: Dominant Wavelength (typ.).

2. Directly below at .5m unless otherwise noted.

LF1D and LF2D

Machine Tools • Food and Beverage Processing Equipment • Vision Systems

LF1D (IP67, IP69K) and LF2D (IP67, IP67F) Series

With their rugged construction, the LF1D/2D series of light units are ideal for machine tools, automated label and package inspection equipment, and food and beverage processing equipment. Their design provides equally brilliant light at the center or edges of the units. Plus with their ratings, the LF1D (IP67, IP67F, IP69K) and LF2D (IP67, IP67F) can be used where high-pressure and high-temperature washdowns are used.

Mini (LF1D-C)

- Compact unit only 100 x 50 x 25mm
- Single LED module design eliminates multiple shadows while distributing light over a wide area (120°)

Slim and Wide (LF1D/2D-EH, FH)

- Brightness: 1450lx at 1m
- Available with terminal block or spring clamp connections for easy installation
- Angle adjustable mounting brackets provide installation flexibility

Long (LF1D-H/J)

- Two lengths available: 365mm and 510mm
- The flat light design reduces glare and multiple shadows, improving visibility from a distance
- M12 Quick Disconnect option (Pig Tail)



LED Optical Specifications

Model	Mini	Slim	Wide	Long	
	LF1D-C	LF1D/2D-EH	LF1D/2D-FH	LF1D-H	LF1D-J
Illumination Color	Cool White			Neutral White	
Total Luminous Flux	560lm	1000lm	1260lm	2000lm	3000lm
Color Temperature	5700K			4700K	
Reference Illuminance at 1.0m	180lx	1450lx	1200lx	560lx	840lx

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

General Specifications

Model	Mini	Slim	Wide	Long	
	LF1D-C	LF1D/2D-EH	LF1D/2D-FH	LF1D-H	LF1D-J
Rated Voltage	24V DC				
Voltage Range	21.6 to 26.4V DC				
Rated Power (typ.)	4.6W	11W	12.5W	18.4W	27.6W
Insulation Resistance	100MΩ minimum (500V DC megger)				
Dielectric Strength	1000V AC, 50/60Hz, 1 minute				
Vibration Resistance (damage limits)	Frequency 5 to 55Hz, amplitude 0.5mm				
Shock Resistance (damage limits)	1000m/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 Environment	No corrosive gases				
Life ¹	50,000 hours (The illumination duration in which the illuminance maintains a minimum of 70% of the initial value at 25°C.)				
Degree of Protection ²	IP67F (reinforced glass), IP67 (all models), IP69K (LF1D)				
Material ³	Housing: Diecast aluminum (LF1D/LF2D), Lens: Reinforced glass or polycarbonate (LF1D/LF2D) Cover: Stainless steel (LF1D), Flange cover: Diecast aluminum (LF2D)				
Weight (approx.)	420g	LF1D-EH-2W*: 750g LF1D-EH-2W-A*: 950g LF2D-EH-2W*: 850g LF2D-EH-2W-A*: 1,000g	LF1D-FH-2W*: 800g LF1D-FH-2W-A*: 1,000g LF2D-FH-2W*: 900g LF2D-FH-2W-A*: 1,050g	1200g	1600g

1. LED life depends on the operating environment.

2. Waterproof or oil-proof characteristics specified by IEC 60529 and JIS0920. For illumination units without accessories, use a cable gland and cables that satisfy IP67F or IP67 degree of protection.

3. The reinforced glass and polycarbonate lens types have the same appearance, but have different degrees of protection (IP67F or IP67).

Part Numbers

Mini (LF1D-C)

Cable		
Location	Length	Part Number



Side	3m	LF1D-C2F-2W-330
	5m	LF1D-C2F-2W-350
Back	3m	LF1D-C2F-2W-430
	5m	LF1D-C2F-2W-450

Long (LF1D-H 365mm)

Cable			Part Number
Location	Length		



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

Long (LF1D-J 510mm)

Cable			Part Number
Location	Length		



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

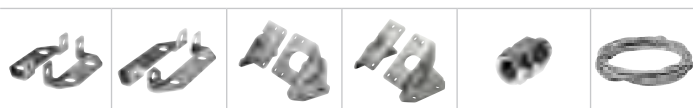
Slim and Wide Surface Mounting (LF1D-EH, FH)

Model			Slim Model (10 LEDs × 1 row)		Wide Model (7 LEDs × 2 rows)	
Cable Gland LF9Z-A11	Cable LF9Z-C05	Mounting Bracket LF9Z-B11,B12	Clear Reinforced Glass	Clear Polycarbonate	Clear Reinforced Glass	Clear Polycarbonate
— (hole on the side)	—	— ✓	LF1D-EH2F-2W LF1D-EH2F-2W-101	LF1D-EH3G-2W LF1D-EH3G-2W-101	LF1D-FH2F-2W LF1D-FH2F-2W-101	LF1D-FH3G-2W LF1D-FH3G-2W-101
— (hole on the back)	—	— ✓	LF1D-EH2F-2W-200 LF1D-EH2F-2W-201	LF1D-EH3G-2W-200 LF1D-EH3G-2W-201	LF1D-FH2F-2W-200 LF1D-FH2F-2W-201	LF1D-FH3G-2W-200 LF1D-FH3G-2W-201
✓ (Side)	— ✓	— ✓	LF1D-EH2F-2W-300 LF1D-EH2F-2W-301	LF1D-EH3G-2W-300 LF1D-EH3G-2W-301	LF1D-FH2F-2W-300 LF1D-FH2F-2W-301	LF1D-FH3G-2W-300 LF1D-FH3G-2W-301
	✓	✓	LF1D-EH2F-2W-350 LF1D-EH2F-2W-A	LF1D-EH3G-2W-350 LF1D-EH3G-2W-A	LF1D-FH2F-2W-350 LF1D-FH2F-2W-A	LF1D-FH3G-2W-350 LF1D-FH3G-2W-A
✓ (Back)	— ✓	— ✓	LF1D-EH2F-2W-400 LF1D-EH2F-2W-401	LF1D-EH3G-2W-400 LF1D-EH3G-2W-401	LF1D-FH2F-2W-400 LF1D-FH2F-2W-401	LF1D-FH3G-2W-400 LF1D-FH3G-2W-401
	✓	✓	LF1D-EH2F-2W-450 LF1D-EH2F-2W-451	LF1D-EH3G-2W-450 LF1D-EH3G-2W-451	LF1D-FH2F-2W-450 LF1D-FH2F-2W-451	LF1D-FH3G-2W-450 LF1D-FH3G-2W-451

Slim and Wide Recessed Mounting (LF2D-EH, FH)

Model		Slim Model (10 LEDs × 1 row)		Wide Model (7 LEDs × 2 rows)	
Cable Gland LF9Z-A11	Cable LF9Z-C05	Clear Reinforced Glass	Clear Polycarbonate	Clear Reinforced Glass	Clear Polycarbonate
—	—	LF2D-EH2F-2W	LF2D-EH3G-2W	LF2D-FH2F-2W	LF2D-FH3G-2W
—	—	LF2D-EH2F-2W-200	LF2D-EH3G-2W-200	LF2D-FH2F-2W-200	LF2D-FH3G-2W-200
✓ (Side)	— ✓	LF2D-EH2F-2W-300 LF2D-EH2F-2W-A	LF2D-EH3G-2W-300 LF2D-EH3G-2W-A	LF2D-FH2F-2W-300 LF2D-FH2F-2W-A	LF2D-FH3G-2W-300 LF2D-FH3G-2W-A
✓ (Back)	— ✓	LF2D-EH2F-2W-400 LF2D-EH2F-2W-450	LF2D-EH3G-2W-400 LF2D-EH3G-2W-450	LF2D-FH2F-2W-400 LF2D-FH2F-2W-450	LF2D-FH3G-2W-400 LF2D-FH3G-2W-450

Accessories



Item	Mounting Bracket				Cable Gland	Cable
	Fixed		Adjustable Angle			
Part Number	LF9Z-B11	LF9Z-B12	LF9Z-1MDE1	LF9Z-1MDF1	LF9Z-A11	LF9Z-C05
Applicable Unit	LF1D (Slim)	LF1D (Wide)	LF1D (Slim)	LF1D (Wide)	LF1D/2D (Slim and Wide)	
Material	Stainless Steel				Brass	PVC
Notes	1 pair, Left and Right				M8*	Length: 5m

*Applicable wire size (10-12 AWG)

Part Number Structure (use for interpreting part numbers only)

LF 1 D - EH 2F - 2 W - 300

Shape
1: Surface mount
2: Recessed mount

Size (LED arrangement)
C: Mini 100mm (3.94")
EH: Slim Model (10 LEDs × 1 row)
FH: Wide Model (7 LEDs × 2 rows)
H: Long 365mm (14.37")
J: Long 510mm (20.08")

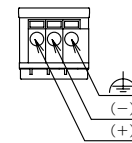
Illumination Color
W: White (except LF1D-H/J)
N: Neutral White (LF1D-H/J)

Lens Type Degree of Protection
2F: Reinforced glass IP67F, IP69K (LF1D) IP67F (LF2D)
3G: Polycarbonate IP67, IP69K (LF1D) IP67 (LF2D)

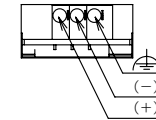
Accessory Options (see chart)

Terminal Block Wiring

Slim Type



Wide Type

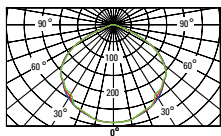


Applicable ferrules: 0.25 to 0.75 mm²
Recommended source - Phoenix Contact:
AI 0,25-12 BU, AI 0,34-12 TQ,
AI 0,5-12 WH, AI 0,75-12 GY

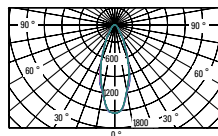
1. Mounting bracket available for LF1D (wide and slim) only.
2. Only available for LF1D (wide and slim) models.
3. 1.5m cable with M12 connector for Long only (LF1D-H, J).

Illuminance Charts

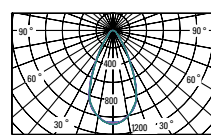
LF1D-C



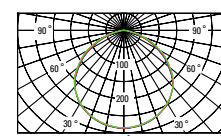
LF1D/2D-EH



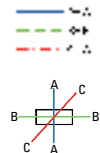
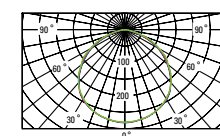
LF1D/2D-FH



LF1D-H

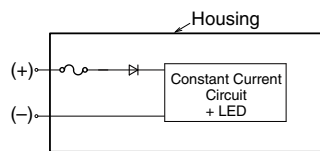


LF1D-J

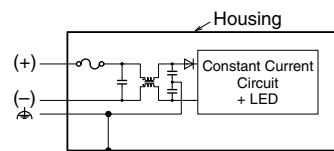


Internal Circuits

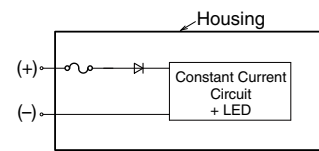
LF1D-C



LF1D/2D-E, EH, F, FH

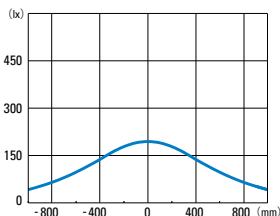


LF1D-H/J

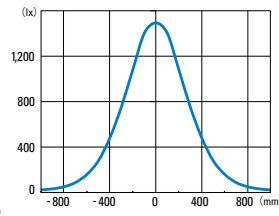


Distribution Characteristics

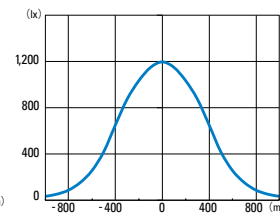
LF1D-C



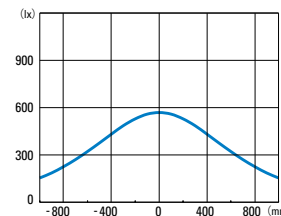
LF1D/2D-EH



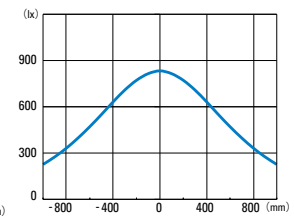
LF1D/2D-FH



LF1D-H

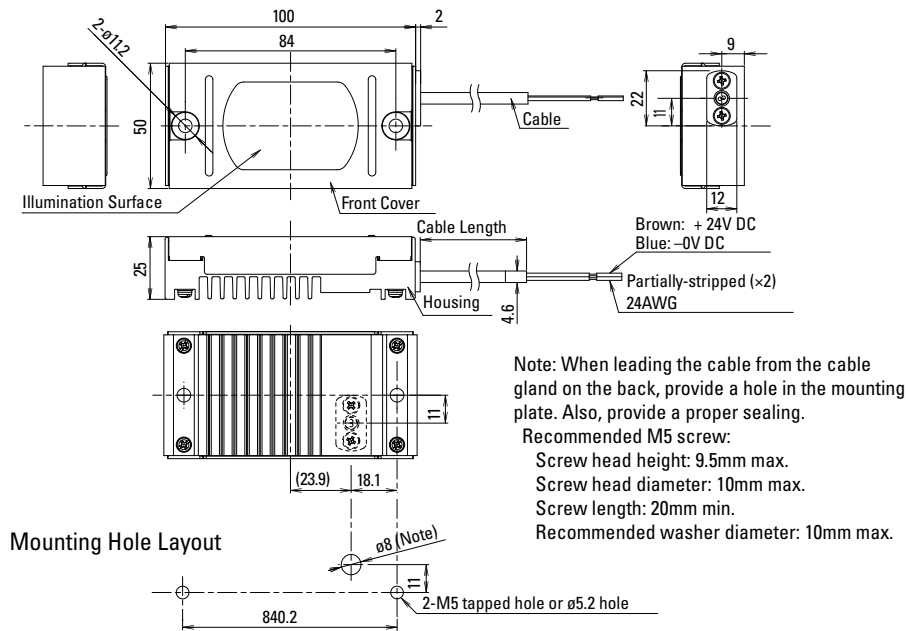


LF1D-J

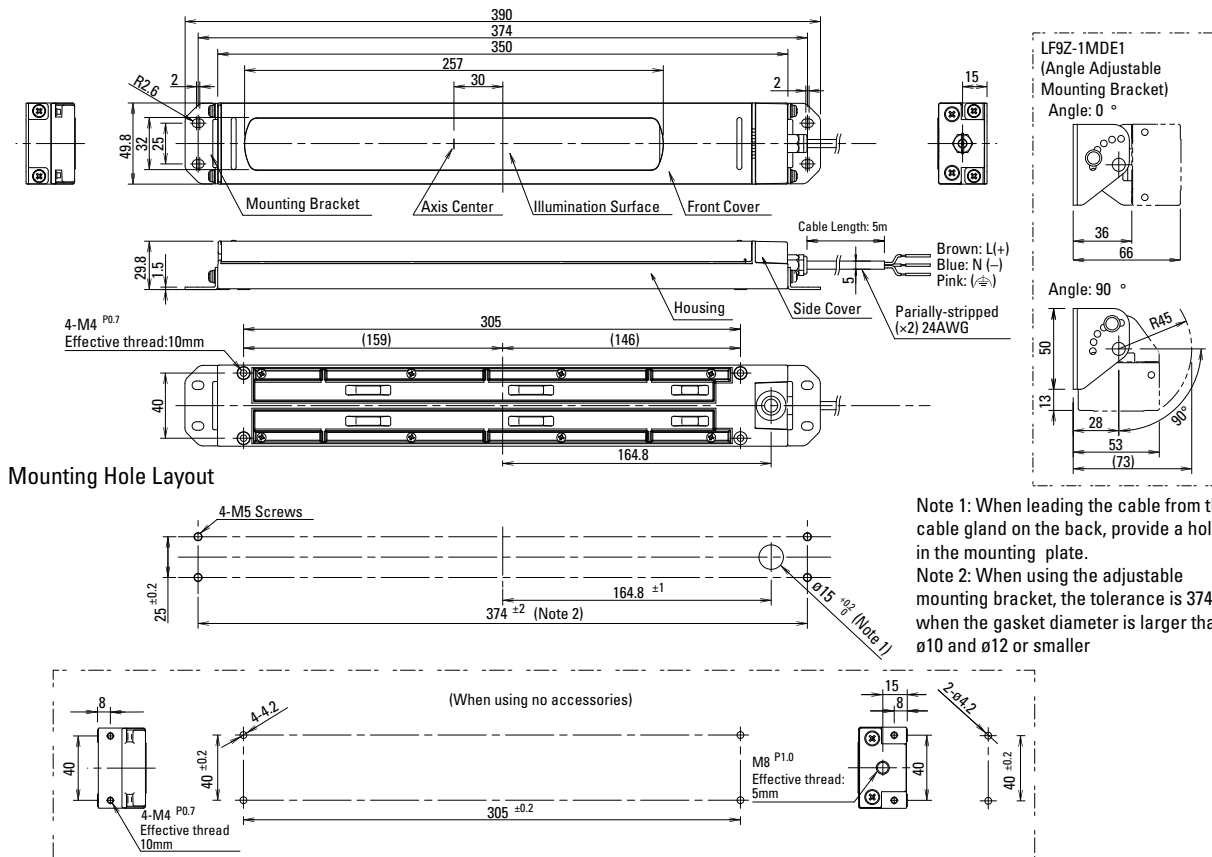


Dimensions (mm)

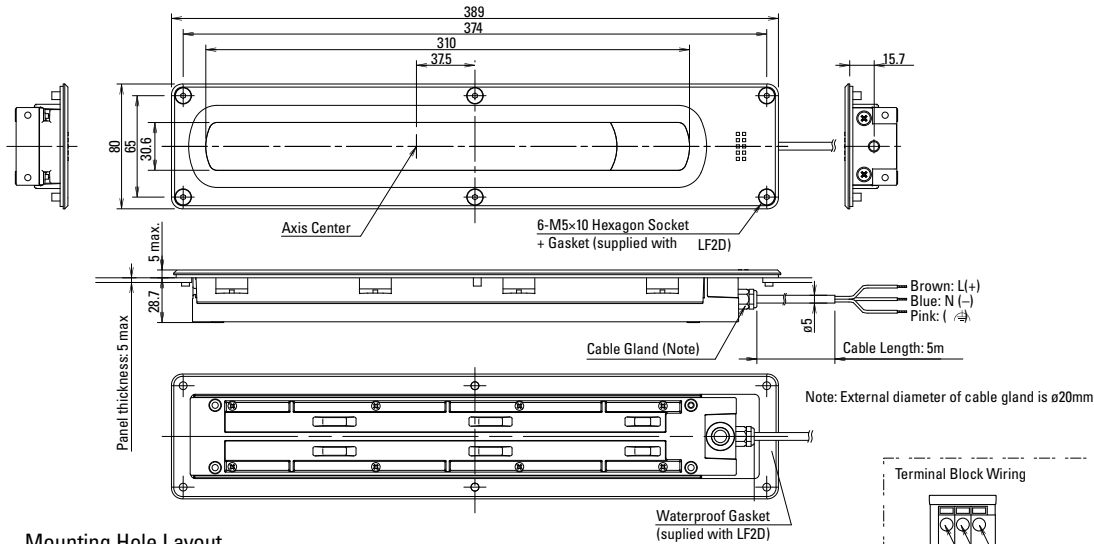
LF1D-C Mini



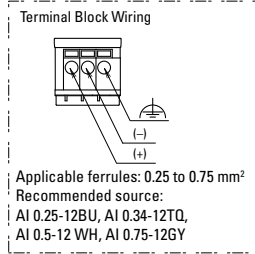
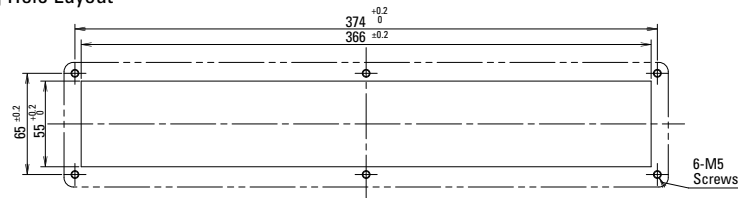
LF1D Slim



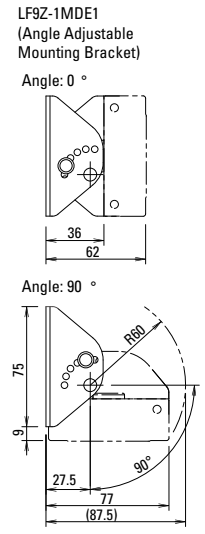
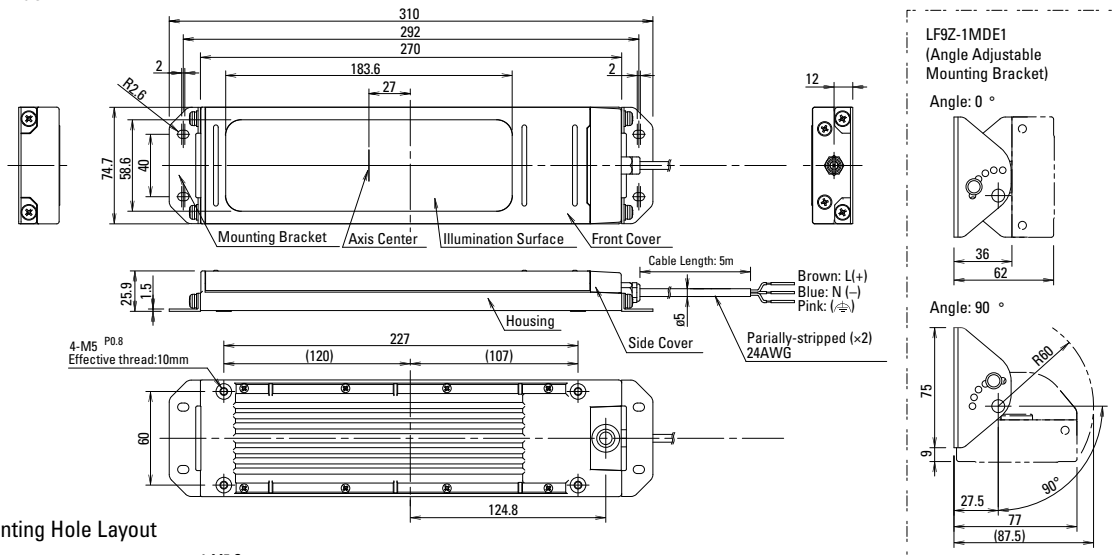
LF2D Slim



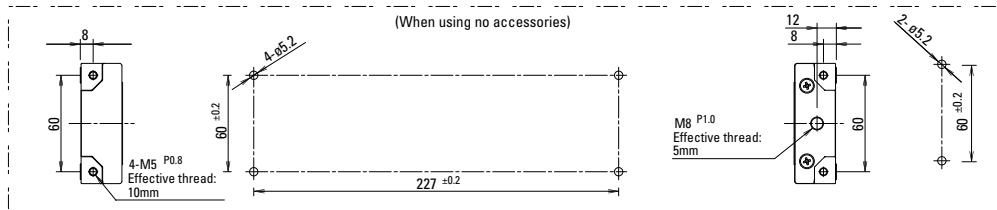
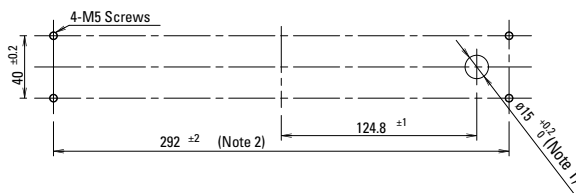
Mounting Hole Layout



LF1D Wide

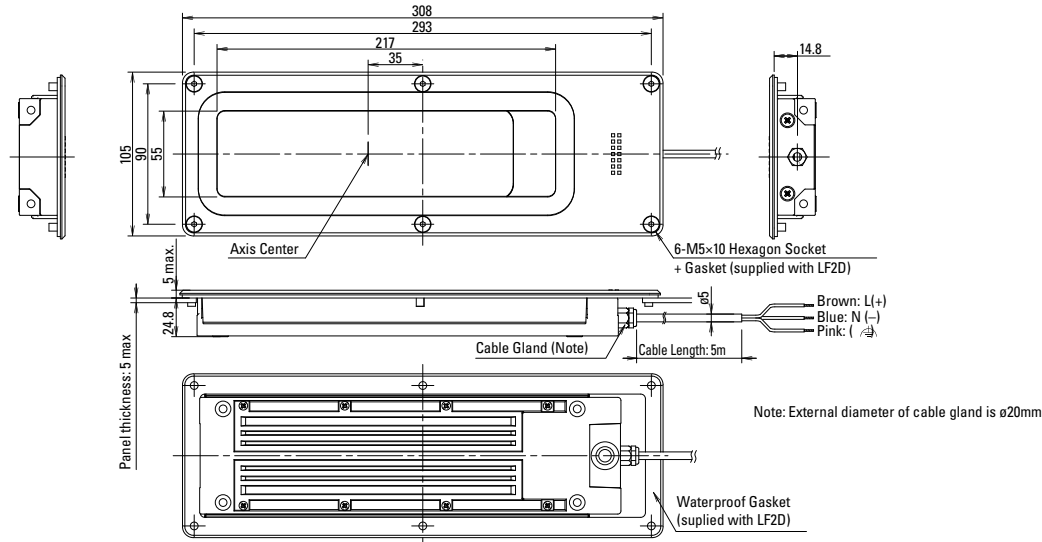


Mounting Hole Layout

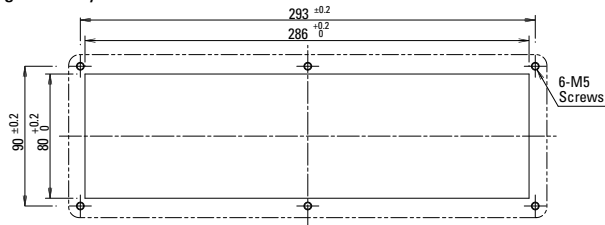


All dimensions in mm.

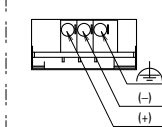
LF2D Wide



Mounting Hole Layout

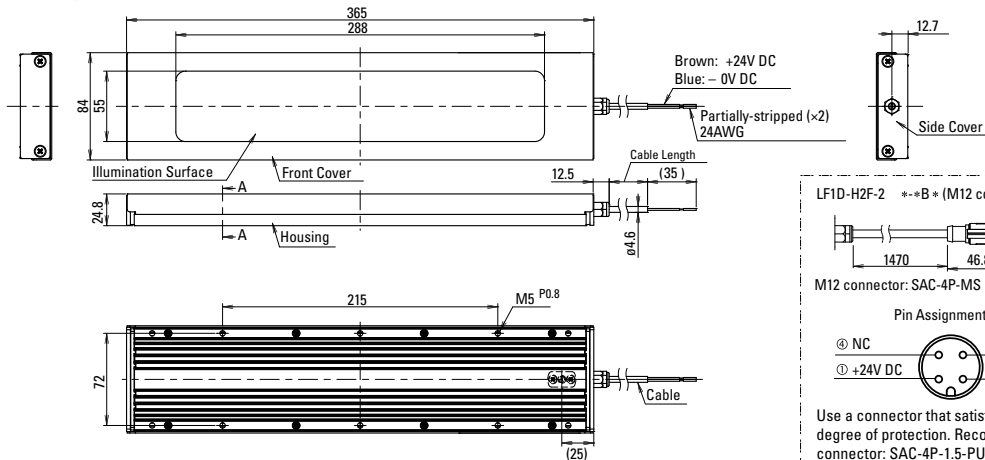


Terminal Block Wiring

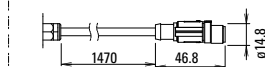


Applicable ferrules: 0.25 to 0.75 mm²
 Recommended source:
 AI 0.25-12BU, AI 0.34-12TQ,
 AI 0.5-12 WH, AI 0.75-12GY

LF1D-H Long

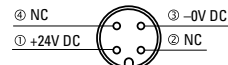


LF1D-H2F-2 *A*B* (M12 connector)



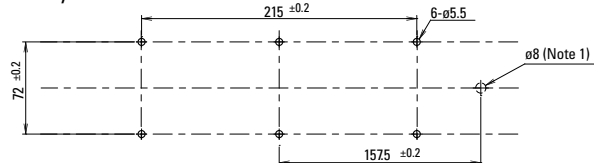
M12 connector: SAC-4P-MS SC0/150/15

Pin Assignment



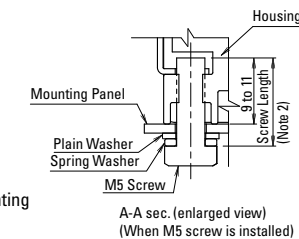
Use a connector that satisfies the required degree of protection. Recommended connector: SAC-4P-1.5-PUR/FS SC0

Mounting Hole Layout



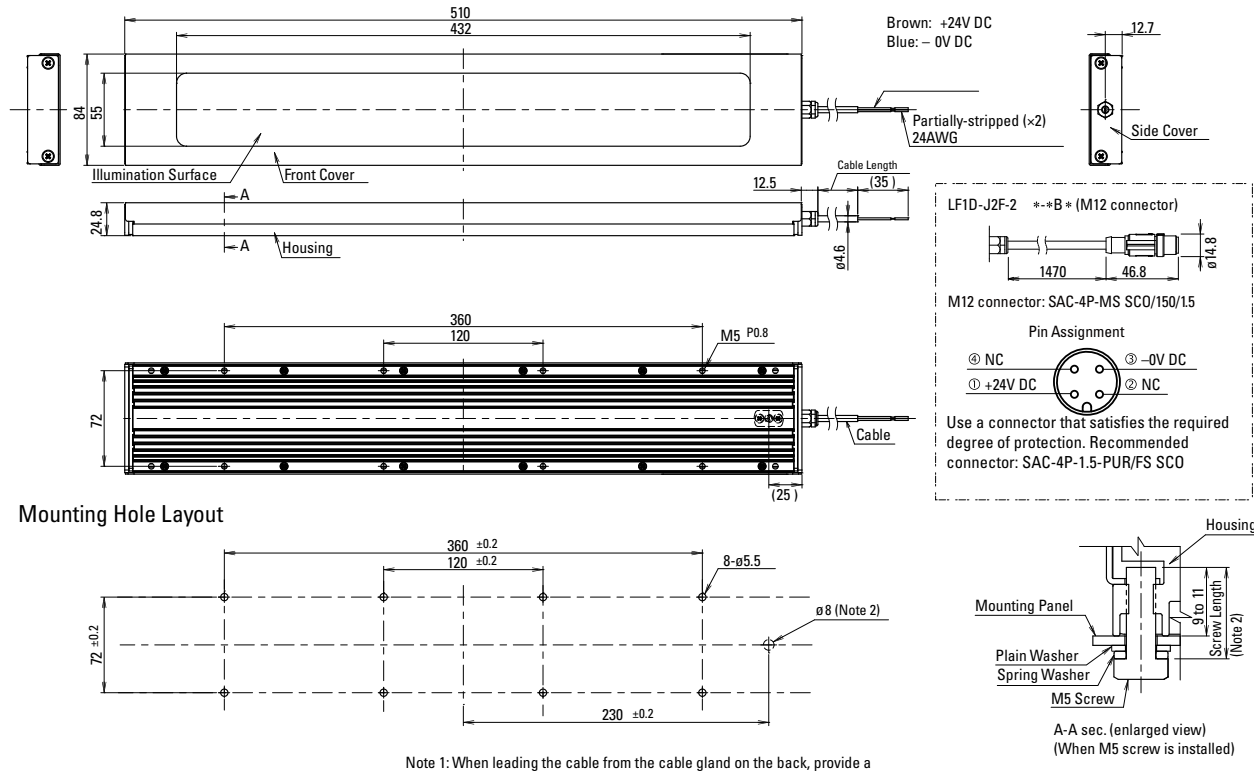
Note 1: When leading the cable from the cable gland on the back, provide a hole in the mounting plate. A $\phi 16$ hole is necessary when using the LF1D-*2F-2N*B* (M12 connector type)

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



A-A sec. (enlarged view)
 (When M5 screw is installed)

LF1D-J Long



Safety Precautions

Do not disassemble, repair, or modify the LF1D/2D. Otherwise electric shock, fire, or malfunction may occur. Before wiring, confirm that the LF1D/2D has cooled down sufficiently. Ensure the correct operating temperature. Otherwise internal temperature rise may result in damage. LED illumination unit is general-purpose industrial electric device. Do not use for electronic equipment which may damage the human body or threaten life in case a malfunction or failure occurs.

Instructions

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

LF2B

Control Panels • Industrial Equipment • Commercial Products

Wide range of input voltages (100 - 240V AC) for commercial applications, and 12/24V DC are available for battery or industrial usage. Slim units can be used in many applications and installations where space is limited. Rated IP65 (protection from water and dust), LF2B is great for environments where there is water spray.

- Slim units: 40mm wide x 29mm high
- One-step installation in a narrow space is possible when using mounting brackets
- Five Lengths (210/330/580/830/1,080mm) are offered to meet space requirements and illumination coverages
- Bright and clear white LED illuminates the shapes and colors of target objects
- Two covers: clear or white



LED Optical Specifications

Model	LF2B-B (210mm)		LF2B-C (330mm)		LF2B-D (580mm)		LF2B-E (830mm)		LF2B-F (1,080mm)	
Illumination Color	White									
Color Temperature	6500K									
Luminous Flux (typ.)	180lm		360lm		720lm		1080lm		1440lm	
Cover	Clear	White	Clear	White	Clear	White	Clear	White	Clear	White
Reference Illuminance (typ.) at 0.5m directly below	290lx	265lx	540lx	500lx	1065lx	980lx	1385lx	1275lx	1520lx	1400lx

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

General Specifications

Model		LF2B-B (210mm)	LF2B-C (330mm)	LF2B-D (580mm)	LF2B-E (830mm)	LF2B-F (1,080mm)
Rated Voltage		100-240V AC 50/60Hz (Voltage range: 90-264V AC)				
		12V/24V DC (Voltage range: 10.8-30V DC)				
Input Current (typical) (at the rated voltage) ¹	AC100~240V AC	28mA	57mA	80mA	128mA	165mA
	12V/24V DC	215mA	409mA	880mA	—	—
Rated Power (at the rated voltage)	100~240V AC	2.2W	4.4W	7.8W	12.2W	15.9W
	12V/24V DC	2.6W	4.9W	10.6W	—	—
Insulation Resistance		100MΩ minimum (500V DC megger)				
Dielectric Strength	100~240V AC	2,000V AC				
	12V/24V DC	1,000V AC				—
Vibration Resistance		Frequency 5 - 55Hz, Amplitude 0.17mm, speed acceleration 20m/s ² , 3 directions, 2 hours each				
Shock Resistance		300m/s ² , 6 directions, 5 times each				
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 ²		40,000 hours (Ta = 25°C) (The total illumination life in which the brightness maintains a minimum of 70% of the initial value.)				
Degree of Protection		IP65 (IEC 60529)				
Material		Front Cover: Polycarbonate Resin; End Cover/Cable Gland: Polyamide Resin; Cable: PVC sheathing (24AWG)				
Weight (approx.)	100~240V AC	200g	255g	400g	520g	645g
	12V/24V DC	175g	235g	370g	—	—

1. 100V AC input for 100 - 240V AC; 12V DC input for 12V/24V DC.

2. LED life is dependent on the operating environment and conditions.

Part Numbers

Illumination Color	White			
Cover	Clear Cover		White Cover	
				
Rated Voltage	100 - 240V AC		12V/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	

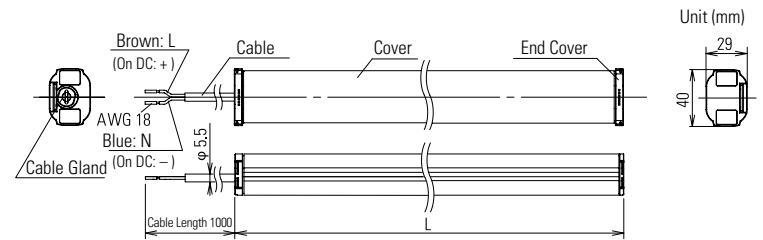
Part Number Structure (use for interpreting part numbers only)

LF2B - C 3 P - ATHWW2 - 1M

Length	Cover	Rated Voltage
B: 210mm (8.27")	3: Clear	A: 100/240V AC
C: 330mm (12.99")	4: White	B: 12V/24V DC
D: 580mm (22.83")		
E: 830mm (32.68")		
F: 1,080mm (42.52")		

DC12V/24V Length: B (210mm), C (330mm), D (580mm) only

Dimensions (mm)



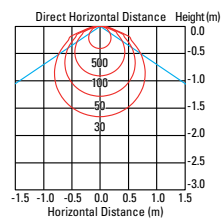
Accessories

Dimension Table

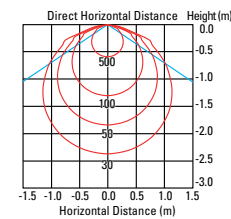
LF2B-B and -C includes 2 brackets each; LF2B-E 3 brackets, and LF2B-F 4 brackets.

Illuminance Distribution at 0.5m (clear cover)

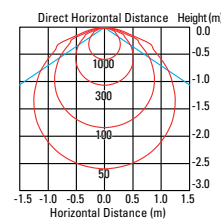
LF2B-B (210mm)



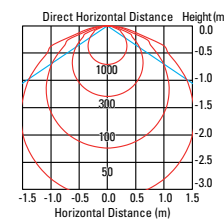
LF2B-C (330mm)



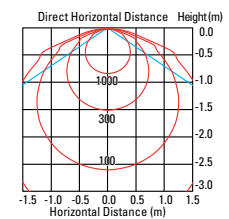
LF2B-D (580mm)



LF2B-E (830mm)



LF2B-F (1,080mm)



LF1B-N Series

Control Panels • Industrial Machines • Commercial Display Cases

The LF1B-N series LED light strips are slim and perfect for applications where space is a concern. They come in six different lengths and six distinct colors, making them a very flexible lighting solution.

- Compact design: 27.5mm wide, 16mm high, and 134 to 1,080mm long
- 6 Colors: cool white, warm white, yellow, red, blue, green
- All units come standard with 3 meter connection cables
- 2 Cover options: clear, white
- IP65 degree of protection (waterproof, dustproof), suitable for use in wet locations



LED Optical Specifications

Illumination Color		Cool White		Warm White		Yellow		Red		Green		Blue	
Cover		Clear	White	Clear	White	Clear	White	Clear	White	Clear	White	Clear	White
Color Temperature/ Dominant Wavelength (typ.)		6500K		3000K		590nm		620nm		525nm		455nm	
Reference Brightness (typ.) at 0.5m	LF1B-NA	95lx	85lx	90lx	80lx	20lx	18lx	20lx	18lx	30lx	27lx	10lx	9lx
	LF1B-NB	240lx	215lx	230lx	210lx	40lx	36lx	40lx	36lx	60lx	55lx	20lx	18lx
	LF1B-NC	455lx	410lx	440lx	395lx	75lx	65lx	75lx	65lx	110lx	100lx	30lx	27lx
	LF1B-ND	840lx	750lx	815lx	725lx	125lx	110lx	125lx	110lx	190lx	170lx	50lx	45lx
	LF1B-NE	1100lx	995lx	1065lx	960lx	160lx	145lx	160lx	145lx	260lx	235lx	60lx	55lx
	LF1B-NF	1350lx	1210lx	1300lx	1170lx	180lx	160lx	180lx	160lx	300lx	270lx	80lx	70lx

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

General 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)	cool 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)	cool 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 55Hz, Amplitude 0.5mm Acceleration 60m/s² (6G), 2 hours each in 3 axes				Frequency: 5 to 55Hz, Amplitude 0.17mm Acceleration 20m/s² (2G), 2 hours each in 3 axes	
Shock Resistance (damage limits)		1,000m/s² (100G), 5 shocks each in 6 axes				300m/s² (30G), 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 brightness 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)					
Weight (approx.)		95g	125g	165g	255g	430g	740g

1. LED life depends on the operating environment.

Part Numbers

Illumination Color	Cool White	Warm White	Yellow	Red	Blue	Green
Appearance						
						
LF1B-NA (134mm)	LF1B-NA⊙P-2THWW2-3M	LF1B-NA⊙P-2TLWW2-3M	LF1B-NA⊙P-2SHY2-3M	LF1B-NA⊙P-2SHR2-3M	LF1B-NA⊙P-2THS2-3M	LF1B-NA⊙P-2SHG2-3M
LF1B-NB (210mm)	LF1B-NB⊙P-2THWW2-3M	LF1B-NB⊙P-2TLWW2-3M	LF1B-NB⊙P-2SHY2-3M	LF1B-NB⊙P-2SHR2-3M	LF1B-NB⊙P-2THS2-3M	LF1B-NB⊙P-2SHG2-3M
LF1B-NC (330mm)	LF1B-NC⊙P-2THWW2-3M	LF1B-NC⊙P-2TLWW2-3M	LF1B-NC⊙P-2SHY2-3M	LF1B-NC⊙P-2SHR2-3M	LF1B-NC⊙P-2THS2-3M	LF1B-NC⊙P-2SHG2-3M
LF1B-ND (580mm)	LF1B-ND⊙P-2THWW2-3M	LF1B-ND⊙P-2TLWW2-3M	LF1B-ND⊙P-2SHY2-3M	LF1B-ND⊙P-2SHR2-3M	LF1B-ND⊙P-2THS2-3M	LF1B-ND⊙P-2SHG2-3M
LF1B-NE (830mm)	LF1B-NE⊙P-2THWW2-3M	LF1B-NE⊙P-2TLWW2-3M	LF1B-NE⊙P-2SHY2-3M	LF1B-NE⊙P-2SHR2-3M	LF1B-NE⊙P-2THS2-3M	LF1B-NE⊙P-2SHG2-3M
LF1B-NF (1,080mm)	LF1B-NF⊙P-2THWW2-3M	LF1B-NF⊙P-2TLWW2-3M	LF1B-NF⊙P-2SHY2-3M	LF1B-NF⊙P-2SHR2-3M	LF1B-NF⊙P-2THS2-3M	LF1B-NF⊙P-2SHG2-3M

In place of ⊙ insert 3 for clear cover and 4 for white cover.

Part Number Structure (use for interpreting part numbers only)

LF1B - NC 3 P - 2 THWW2 - 3M

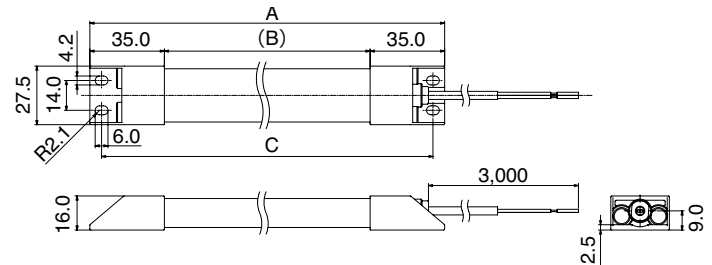
Length
 A: 134mm (5.28")
 B: 210mm (8.27")
 C: 330mm (12.99")
 D: 580mm (22.83")
 E: 830mm (32.68")
 F: 1,080mm (42.52")

Cable Length
 3M: 3m
 1M: 1m

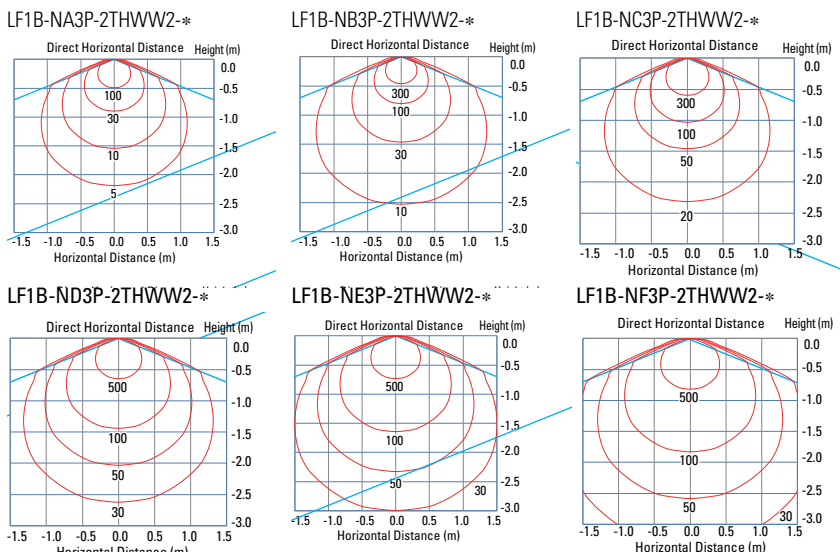
Cover
 3: Clear
 4: White

Illumination Color
 THWW2: Cool white
 TLWW2: Warm white
 SHY2: Yellow
 SHR2: Red
 THS2: Blue
 SHG2: Green

Dimensions (mm)



Illuminance Distribution (lx)



Accessory

Dimension Table

Model	A		B		C	
	mm	inch	mm	inch	mm	inch
LF1B-NA	134	5.28	64	2.52	123	4.84
LF1B-NB	210	8.27	140	5.51	199	7.83
LF1B-NC	330	12.99	260	10.24	319	12.56
LF1B-ND	580	22.83	510	20.08	569	22.40
LF1B-NE	830	32.68	760	29.92	819	32.24
LF1B-NF	1080	42.52	1010	39.76	1069	42.09

LF1A Series

Control Panels • Manufacturing Equipment

LF1A LED strips use super-bright multi-chip LEDs providing illumination equivalent to a 25W fluorescent lamp, while consuming only one-third the power. They come in a thin housing available in three sizes with four color configurations: cool white (5500K), warm white (2800K), yellow (590nm) and red (625nm).

- Brightness: 66.6 Lumens/Watt
- Energy savings: One-third of fluorescent lamps
- Long life: 40,000 hrs (Half-life)
- UL Listed
- RoHS Compliant
- IP40



LED Optical Specifications

Model		LF1A-*2THWW6	LF1A-*2TLWW6	LF1A-*2SHY8	LF1A-*2SHR8
Illumination Color		Cool White	Warm White	Yellow	Red
Luminous Intensity (Single LED module)		6000mcd	4000mcd	4000mcd	2500mcd
Color Temperature / Dominant Wavelength		5500K	2800K	590nm	625nm
Reference Illuminance at 0.5m	LED Array 3 x 2	190lx	130lx	130lx	85lx
	LED Array 6 x 2	380lx	260lx	260lx	170lx
	LED Array 12 x 2	760lx	520lx	520lx	340lx

*LED Array A1 = 3x2, B1 = 6x2, D1 = 12x2

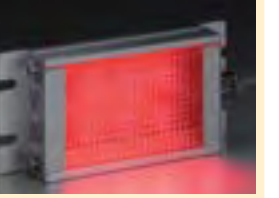
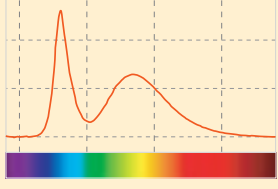
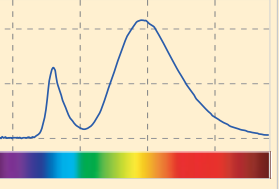
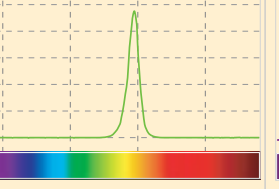
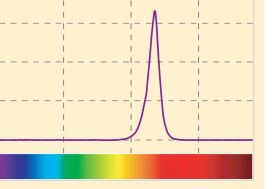
General Specifications

Model		LF1A-*-2THWW6	LF1A-*-2TLWW6	LF1A-*-2SHY8	LF1A-*-2SHR8
Rated Voltage		24V DC (non-polarized)			
Input Current (at rated voltage)	LED Array 3 x 2	75mA		90mA	
	LED Array 6 x 2	150mA		180mA	
	LED Array 12 x 2	300mA		360mA	
Rated Power (at rated voltage)	LED Array 3 x 2	1.8W		2.2W	
	LED Array 6 x 2	3.6W		4.4W	
	LED Array 12 x 2	7.2W		8.7W	
Dielectric Strength		Between live and dead parts: 1000V AC, 1 minute			
Insulation Resistance		Between live and dead parts: 100 MΩ (500V DC megger)			
Operating Temperature		-20 to +50°C			
Storage Temperature		-25 to +70°C			
Operating/Storage Humidity		45 to 85% RH (no condensation)			
Life (half luminance) ²		40,000 hours			
Weight (approx.)		LF1A-A1: 190g, LF1A-B1: 270g, LF1A-D1: 470g			
Degree of Protection		IP40			

1. *LED Array A1 = 3x2, B1 = 6x2, D1 = 12x2

2. LED life depends upon operating environment.

Part Numbers

Color	Cool White	Warm White	Yellow	Red
Part No.	LF1A-*2THWW6	LF1A-*2TLWW6	LF1A-*2SHY8	LF1A-*2SHR8
Appearance				
Light Spectrum				

*LED Array A1 = 3x2, B1 = 6x2, D1 = 12x2

Part Number Structure (use for interpreting part numbers only)

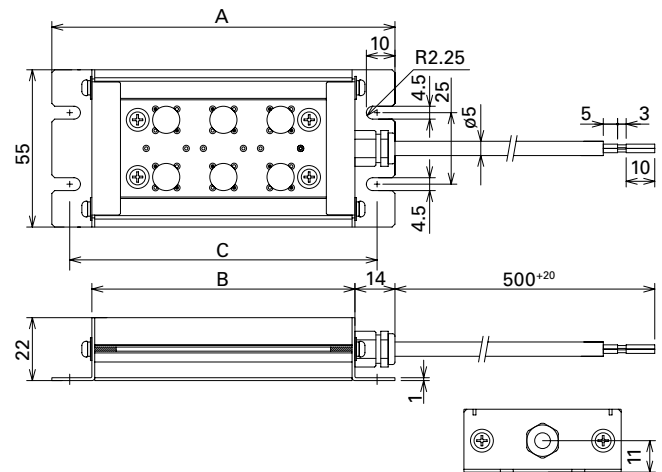
LF1A – A1 – 2 THWW6

LED Module Arrangement
 A1: 3 LEDs × 2 rows
 B1: 6 LEDs × 2 rows
 D1: 12 LEDs × 2 rows

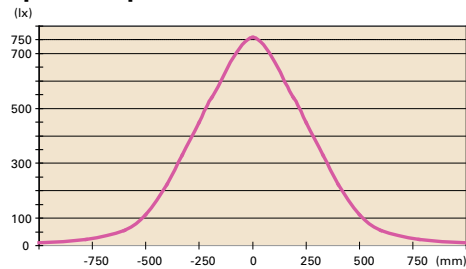
LED Illumination Color
 THWW6: Cool White
 TLWW6: Warm white
 SHY8: Yellow
 SHR8: Red

Dimension Table

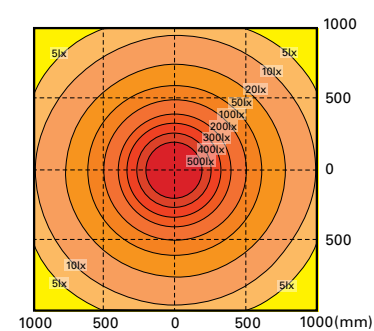
Dimensions (mm)



Optical Dispersion at 0.5m LF1A-D1-THWW6 (Cool White)



Illuminance Chart LF1A-D1-2THWW6



Accessories



Item	Mounting Bracket- Adjustable Angle
Part No.	LF9Z-1MA1
Material	Stainless Steel

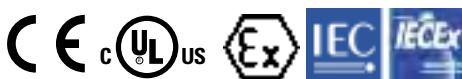
1 pair, Left and Right

EF1A Series

Hazardous locations: Oil & Gas, Water Treatment, Chemical Plants, Painting Booths

With UL Class I, Zone 1 and Type 4X ratings, the EF1A series can be used in hazardous locations, making it well-suited to handle applications in oil & gas industries, water treatment, chemical plants, painting booths and more. This design also allows for increased mounting versatility with mounting options including adjustable, fixed angle, or no mounting bracket. And with major international certifications, EF1A can even be used in applications worldwide.

- Hazardous location LED flood lights (Class I, Zone 1 and Zone 2)
- Heavy-duty aluminum housing with reinforced glass lens
- Narrow-angle and wide-angle beam models available
- Clear or translucent lenses
- Available with adjustable, fixed angle or no mounting bracket
- Four conduit sizes available
- Type 4X (IP67) without switch
- Type 3S (IP65) with switch
- IP65 (with switch)



LED Optical Specifications

Lens Type Collecting Lens (Optical Dispersion)	Clear		Diffused	
	With	Without	With	Without
Number of LEDs	16			
Illumination Color	Cool White			
Color Temperature (typ.)	5700K			
Total Luminous Flux (typ.)	960lm			
Reference Illuminance (typ.) At 1.0m directory below	1100lx	450lx	205lx	175lx

Certifications and Compliances

NEC and CEC	IEC and ATEX (94/9/EC)
Cl. I, Zone 1, Groups IIB	Zones 1 & 21 and 2 & 22
UL: Class I, Zone 1, AEx d IIB T4 Gb	ATEX: II 2G Ex d IIB T4 Gb II 2D Ex tb IIIC T 130°C Db IP67 (or IP65)
c-UL: Ex d IIB T4 Gb X	IECEx: Ex d IIB T4 Gb Ex tb IIIC T 130°C Db IP67 (or IP65)
Certificate/file number: UL/c-UL E353024	Certificate numbers: DEMKO 14 ATEX 1208667X IECEx UL 14.0048X

General Specifications

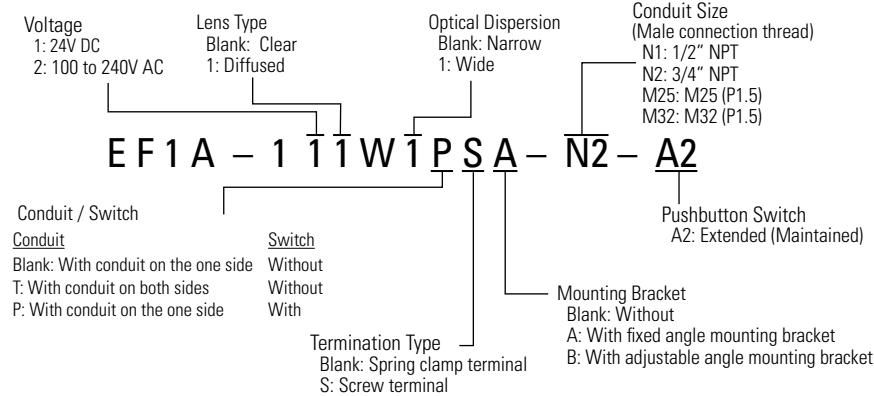
Model	EF1A -11	EF1A -12
Rated Voltage	24V DC	100 to 240V AC
Voltage Range	21.6 to 26.4V DC	90 to 264V AC
Rated Power (Typ.)	17W (at rated voltage)	19W (at rated voltage)
Dielectric Strength	500V AC 1 minute input - FG	2000V AC 1 minute input - FG
Insulation Resistance	100MΩ minimum (500V DC megger) input - FG	
Vibration Resistance (damage limits)	Frequency 5 to 55Hz, amplitude 0.5mm	
Shock Resistance (damage limits)	1000m/s ²	
Operating Temperature	-20 to +50°C (no freezing)	
Operating Humidity	45 to 85% RH (no condensation)	
Storage Temperature	-35 to +70°C (no freezing)	
Life ¹	Over 50,000 hours (The illumination duration in which the brightness maintains a minimum of 70% of initial value at 25°C)	
Material	Housing: aluminum, Front panel: stainless steel, Mounting bracket: stainless steel Lens: reinforced glass	
Weight (approx.)	2.9Kg (without mounting bracket), 3.1Kg (with mounting bracket)	

Part Numbers

Rated Voltage	Optical Dispersion	Lens Type ①	Conduit Entry ②	Termination Type ③	Conduit Size ④	Pushbutton Switch ⑤	Mounting Bracket	Part No.
100 to 240V AC	Narrow	Blank: Clear glass 1: Diffused glass	Blank: One Side T: Both Sides P: One Side (Another Side Switch)*	Blank: Spring Clamp Terminal S: Screw Terminal	N1: 1/2"NPT N2: 3/4"NPT M25: M25 (P1.5) M32: M32 (P1.5)	Empty: Without pushbutton switch - type 4x (IP67)	Without (4-M6 screw on the back of EF1A)	EF1A-12①W②③-④-⑤
							With (Fixed angle)	EF1A-12①W②③A-④-⑤
							With (Adjustable angle)	EF1A-12①W②③B-④-⑤
	Wide						Without (4-M6 screw on the back of EF1A)	EF1A-12①W1②③-④-⑤
							With (Fixed angle)	EF1A-12①W1②③A-④-⑤
							With (Adjustable angle)	EF1A-12①W1②③B-④-⑤
24V DC	Narrow				(Male connection thread)	A2: With pushbutton switch - type 3S (IP65)	Without (4-M6 screw on the back of EF1A)	EF1A-11①W②③-④-⑤
							With (Fixed angle)	EF1A-11①W②③A-④-⑤
							With (Adjustable angle)	EF1A-11①W②③B-④-⑤
	Wide						Without (4-M6 screw on the back of EF1A)	EF1A-11①W1②③-④-⑤
							With (Fixed angle)	EF1A-11①W1②③A-④-⑤
							With (Adjustable angle)	EF1A-11①W1②③B-④-⑤

* End of Part No. is marked A2 (pushbutton switch)

Part Number Structure (use for interpreting part numbers only)



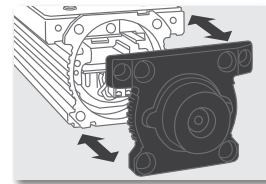
Termination Type



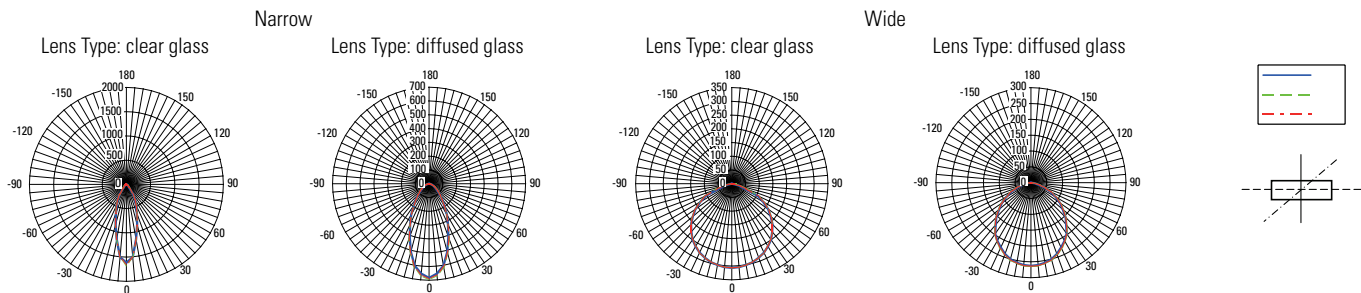
Spring clamp terminal



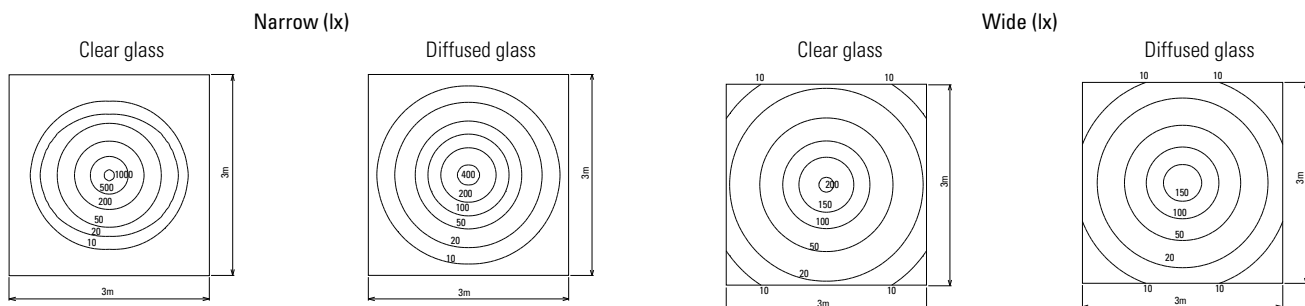
Screw terminal



Optical Dispersion (cd/1000lm)

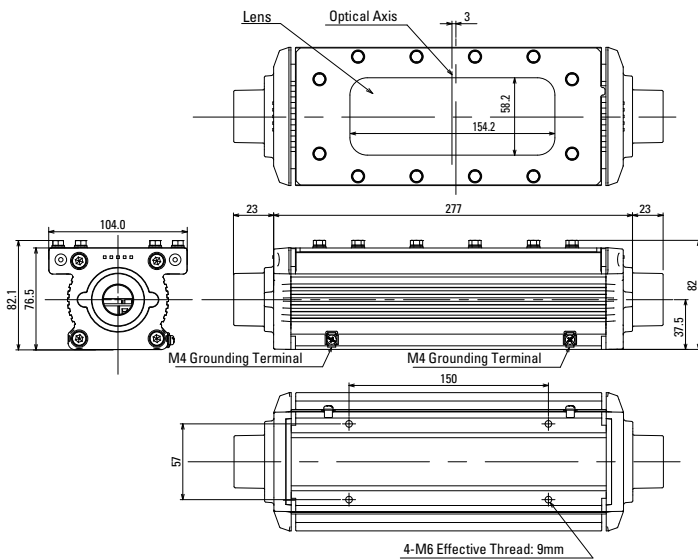


Illuminance Distribution (at 1.0m)

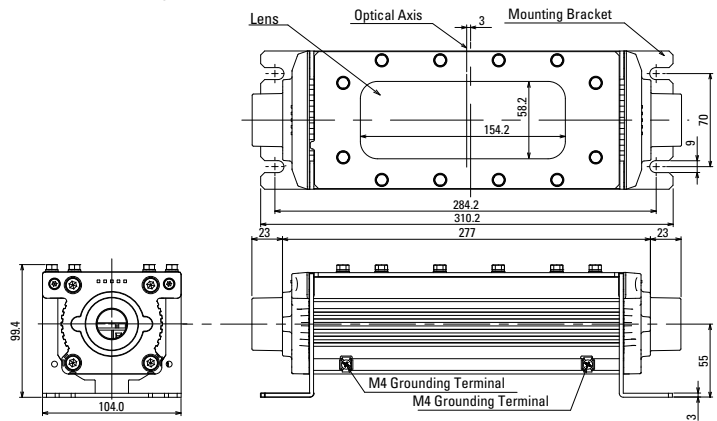


Dimensions

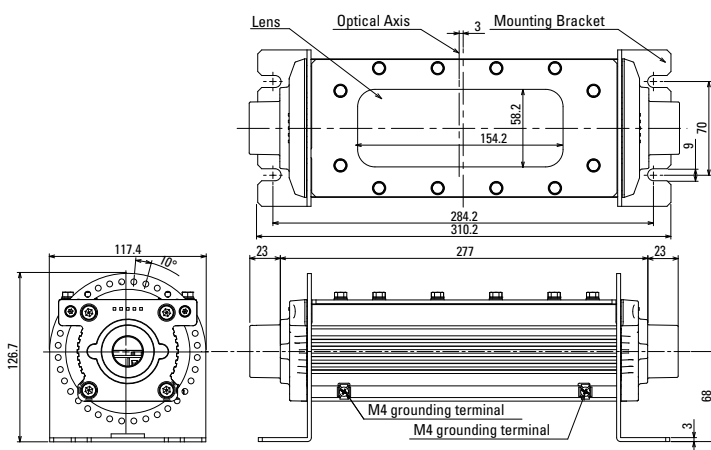
1) Direct mounting



2) With fixed mounting bracket

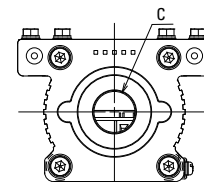
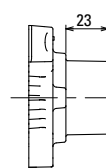


3) With angle adjustable bracket

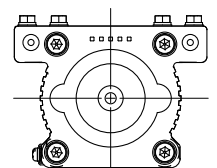


(4) Dimension of conduit entry and ON/OFF switch and end cover

Conduit entry or End cover



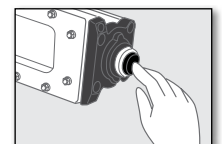
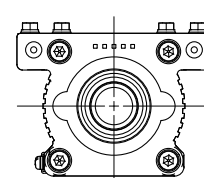
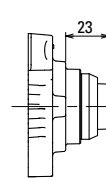
Conduit Entry Cover



End Cover

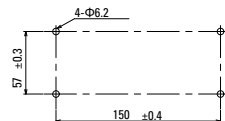
Conduit entry size	C
N1	1/2" NPT
N2	3/4" NPT
M25	M25 P1.5
M32	M32 P1.5

With ON/OFF Switch

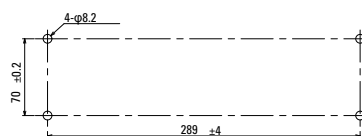


(5) Mounting hole layout

1) Direct mounting



2) With mounting bracket/angle adjustable bracket



(6) Attachments

- Instruction Manual.....1
- Hexagon Wrench (3).....1 (only with bracket)
- Hexagon Wrench (5).....1



With angle adjustable bracket