LED Machine Lighting

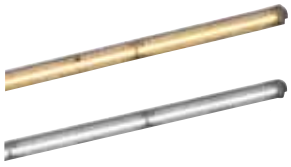
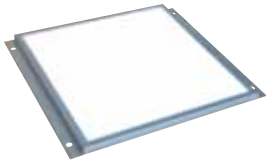
Lumifa

IDEC

www.IDEC.com/usa/LED

Selection Guide

Series	LF1B-N	LF1B	LF2B	LF1A
Appearance				
Page	3	Visit www.IDEC.com/usa/LED	6	9
Color Temperature (typ.)	2,900K	2,800K, 5,500K	5,500K	5,500K
Reference illuminance (max)	935lx	560lx	1,160lx	760lx
Power consumption	1.0 to 17.3W	0.8 to 5.8W	2.6 to 21.8W	1.8 to 8.7W
Operating voltage	24V DC	24V DC	100-240V AC 12V/24V DC	24V DC
IP rating	IP65	IP54	IP65	IP40
Color	cool white, warm white, yellow, red, blue, green	cool white, warm white, yellow, red	white	cool white, warm white, yellow, red

Series	LF1D & LF2D	LF1E	LF1F	EF1A
Appearance				
Page	11	17	20	21
Color Temperature (typ.)	5,700K	3,000K, 5,000K	8,500K	5,700K
Reference illuminance (max)	1,450lx	2,000lx	5,800lx	1,100lx
Power consumption	9W or 12.5W	8.4 to 26.3W	11W	16W, 19W
Operating voltage	24V DC	24V DC	24V DC	24V DC, 100 to 240V AC
IP rating	IP69K, IP67, IP67f	IP54	IP20	IP67
Color	cool white	cool white, warm white	white	white

LF1B-N Series

Key features:

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

Part Numbers

Illumination Color		Cool White	Warm White	Yellow	Red	Blue	Green
Appearance	Clear cover						
	White cover						
LF1B-NA (134mm)	Clear cover	LF1B-NA3P-2THWW2-3M	LF1B-NA3P-2TLWW2-3M	LF1B-NA3P-2SHY2-3M	LF1B-NA3P-2SHR2-3M	LF1B-NA3P-2THS2-3M	LF1B-NA3P-2SHG2-3M
	White cover	LF1B-NA4P-2THWW2-3M	LF1B-NA4P-2TLWW2-3M	LF1B-NA4P-2SHY2-3M	LF1B-NA4P-2SHR2-3M	LF1B-NA4P-2THS2-3M	LF1B-NA4P-2SHG2-3M
LF1B-NB (210mm)	Clear cover	LF1B-NB3P-2THWW2-3M	LF1B-NB3P-2TLWW2-3M	LF1B-NB3P-2SHY2-3M	LF1B-NB3P-2SHR2-3M	LF1B-NB3P-2THS2-3M	LF1B-NB3P-2SHG2-3M
	White cover	LF1B-NB4P-2THWW2-3M	LF1B-NB4P-2TLWW2-3M	LF1B-NB4P-2SHY2-3M	LF1B-NB4P-2SHR2-3M	LF1B-NB4P-2THS2-3M	LF1B-NB4P-2SHG2-3M
LF1B-NC (330mm)	Clear cover	LF1B-NC3P-2THWW2-3M	LF1B-NC3P-2TLWW2-3M	LF1B-NC3P-2SHY2-3M	LF1B-NC3P-2SHR2-3M	LF1B-NC3P-2THS2-3M	LF1B-NC3P-2SHG2-3M
	White cover	LF1B-NC4P-2THWW2-3M	LF1B-NC4P-2TLWW2-3M	LF1B-NC4P-2SHY2-3M	LF1B-NC4P-2SHR2-3M	LF1B-NC4P-2THS2-3M	LF1B-NC4P-2SHG2-3M
LF1B-ND (580mm)	Clear cover	LF1B-ND3P-2THWW2-3M	LF1B-ND3P-2TLWW2-3M	LF1B-ND3P-2SHY2-3M	LF1B-ND3P-2SHR2-3M	LF1B-ND3P-2THS2-3M	LF1B-ND3P-2SHG2-3M
	White cover	LF1B-ND4P-2THWW2-3M	LF1B-ND4P-2TLWW2-3M	LF1B-ND4P-2SHY2-3M	LF1B-ND4P-2SHR2-3M	LF1B-ND4P-2THS2-3M	LF1B-ND4P-2SHG2-3M
LF1B-NE (830mm)	Clear cover	LF1B-NE3P-2THWW2-3M	LF1B-NE3P-2TLWW2-3M	LF1B-NE3P-2SHY2-3M	LF1B-NE3P-2SHR2-3M	LF1B-NE3P-2THS2-3M	LF1B-NE3P-2SHG2-3M
	White cover	LF1B-NE4P-2THWW2-3M	LF1B-NE4P-2TLWW2-3M	LF1B-NE4P-2SHY2-3M	LF1B-NE4P-2SHR2-3M	LF1B-NE4P-2THS2-3M	LF1B-NE4P-2SHG2-3M
LF1B-NF (1,080mm)	Clear cover	LF1B-NF3P-2THWW2-3M	LF1B-NF3P-2TLWW2-3M	LF1B-NF3P-2SHY2-3M	LF1B-NF3P-2SHR2-3M	LF1B-NF3P-2THS2-3M	LF1B-NF3P-2SHG2-3M
	White cover	LF1B-NF4P-2THWW2-3M	LF1B-NF4P-2TLWW2-3M	LF1B-NF4P-2SHY2-3M	LF1B-NF4P-2SHR2-3M	LF1B-NF4P-2THS2-3M	LF1B-NF4P-2SHG2-3M
Applications		Industrial Machines Plant equip. Inspection/test equip. Control panels	Food processing machines Cosmetic plants Chemical plants Showcases	Semiconductor manufacturing equip. IC foundries	Photosensitive materials Semiconductor manufacturing equip. Darkroom experiments	Signage Decorative lighting	

Part Number Structure

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")

Cover
3: Clear
4: White

Illumination Color

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

Cable Length
3M: 3m

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 55 Hz, Amplitude 0.5mm Acceleration 60m/s^2 (6G), 2 hours each in 3 axes				Frequency: 5 to 55 Hz, Amplitude 0.17mm Acceleration 20m/s^2 (2G), 2 hours each in 3 axes	
Shock Resistance (damage limits)		1,000m/s^2 (100G), 5 shocks each in 6 axes				300m/s^2 (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

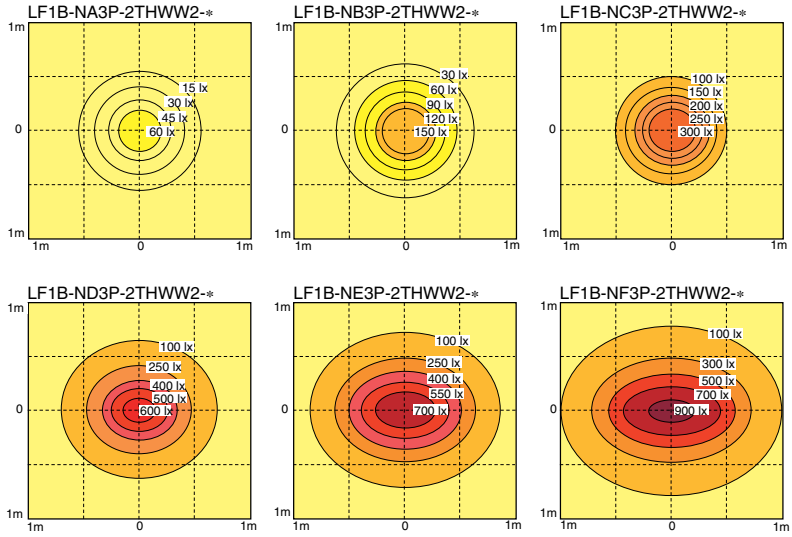
Note: LED life depends on the operating environment.

LED Optical Specifcations

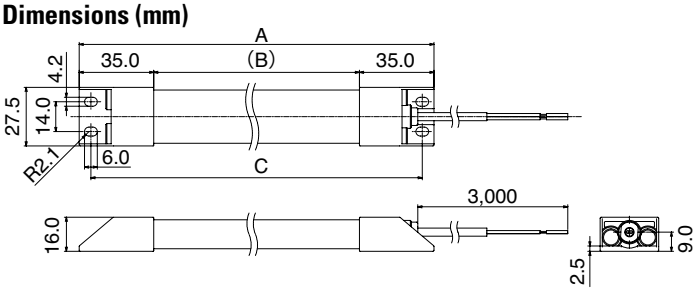
Illumination Color		Cool White		Warm White		Yellow		Red		Green		Blue	
Cover		Clear	White	Clear	White	Clear	White	Clear	White	Clear	White	Clear	White
Color Temperature/ Dominant Wavelength (typ.)		5,500K		2,900K		590nm		620nm		525nm		455nm	
Reference Brightness (typ.) at 0.5m	LF1B-NA	90lx	80lx	60lx	55lx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

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

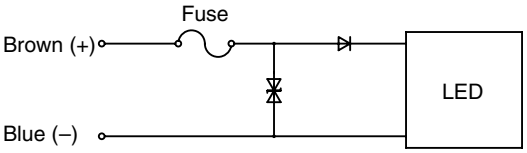
Brilliance Distribution at 0.5m (reference value)



Dimensions (mm)



Internal Circuit



Safety Precautions

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

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

Instructions

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

LF2B Series

Key features:

Wide range of input voltages (100 - 240V AC) and DC-battery compatible 12/24V DC are available. 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 water is sprayed.

- Slim units: 40mm (w) x 29mm (h). Using mounting brackets, one-step installation in a narrow space is possible.
- 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. (LF2B illuminance is approximately 25% higher than the LF1B.)
- Two covers: clear or white

*UL applies for DC units only.

Part Numbers

Illumination Color	White			
	Clear Cover		White Cover	
External appearance				
Rated Voltage	100 - 240V AC	12V/24V DC	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

LF2B - C 3 P - ATHWW2 - 1M

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

Cover
- 3: Clear
- 4: White

Rated Voltage
- A: 100/240V AC
- B: 12V/24V DC

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

Accessories

Item	Part Number	Remarks
Mounting Bracket (U-shape)	LF9Z-1SB21	Comes with the product (see Note below)
Mounting Bracket (L-shape)	LF9Z-1SB22	Order separately

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

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	33mA	67mA	96mA	149mA	226mA
	DC12V/24V	215mA	409mA	880mA	–	
Rated Power (at the rated voltage)	AC100~240V	3.8W	7.5W	9.2W	14.3W	21.8W
	DC12V/24V	2.6W	4.9W	10.6W	–	
Insulation Resistance		100MΩ minimum (500V DC megger)				
Dielectric Strength	AC100~240V	AC2,000V				
	DC12V/24V	AC1,000V			–	
Vibration Resistance		Frequency 5 - 55 Hz, 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.)	AC100~240V	200g	255g	400g	520g	645g
	DC12V/24V	175g	235g	370g	–	

1. AC100V input for AC100 - 240V; DC12V input for DC12V/24V
2. LED life is dependent on the operating environment and conditions.

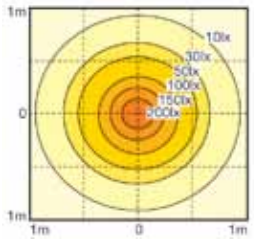
LED Optical Specifcations

Illumination Color	White									
Color Temperature/ Dominant Wavelength (typ.)	5,500K									
Part Number	LF2B-B (210mm)		LF2B-C (330mm)		LF2B-D (580mm)		LF2B-E (830mm)		LF2B-F (1,080mm)	
Luminus Flux	180 lm		360 lm		720 lm		1,080 lm		1,440 lm	
Illumination Surface	Clear	Diffused	Clear	Diffused	Clear	Diffused	Clear	Diffused	Clear	Diffused
Reference Brightness (typ.) at 0.5m	230 lx	215 lx	425 lx	390 lx	710 lx	645 lx	930 lx	835 lx	1,160 lx	1,040 lx

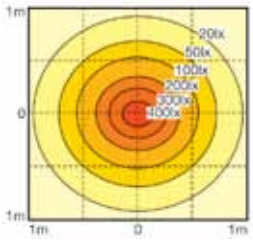
Note: Due to the variability of LED modules, products with same model number may vary slightly in illumination color and luminance.

Illuminance Charts (Clear light at 0.5m)

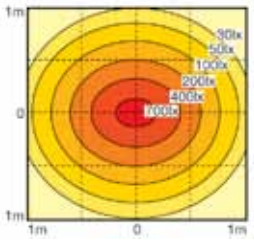
LF2B-B (210mm)



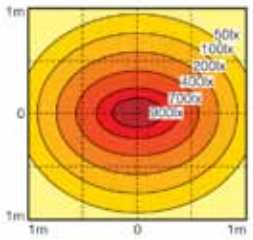
LF2B-C (330mm)



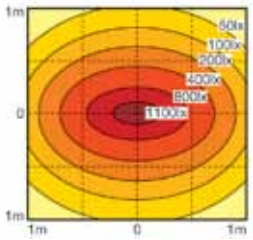
LF2B-D (580mm)



LF2B-E (830mm)

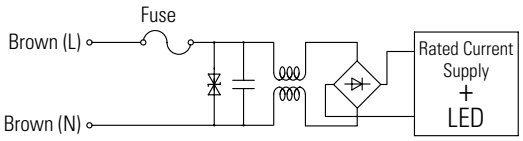


LF2B-F (1,080mm)

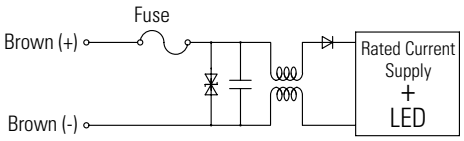


Circuit Diagram

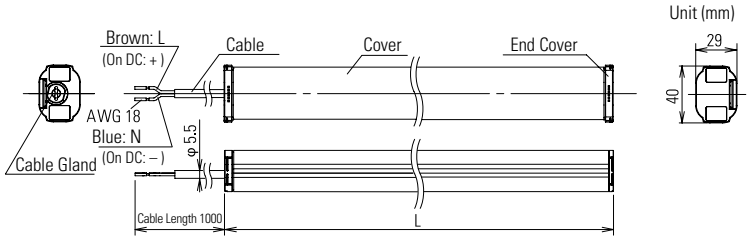
AC100~240V



DC12V/24V

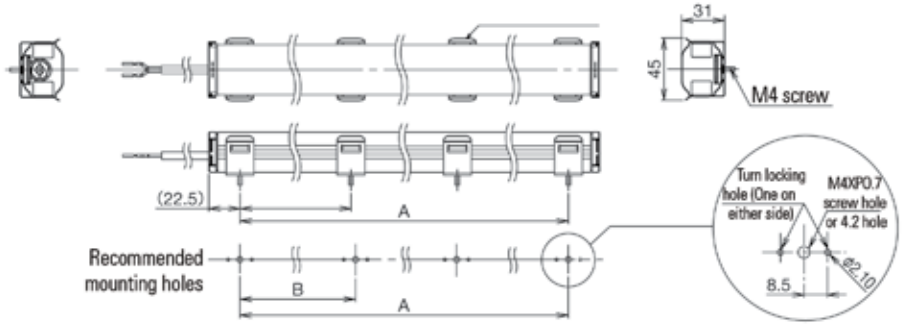


Dimensions (mm)

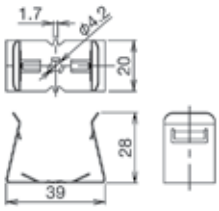


Part Number	L (mm)	Inch
LF2B-B□P-◇THWW2-1M	210	8.27
LF2B-C□P-◇THWW2-1M	330	12.99
LF2B-D□P-◇THWW2-1M	580	22.83
LF2B-E□P-◇THWW2-1M	830	32.68
LF2B-F□P-◇THWW2-1M	1,080	42.52

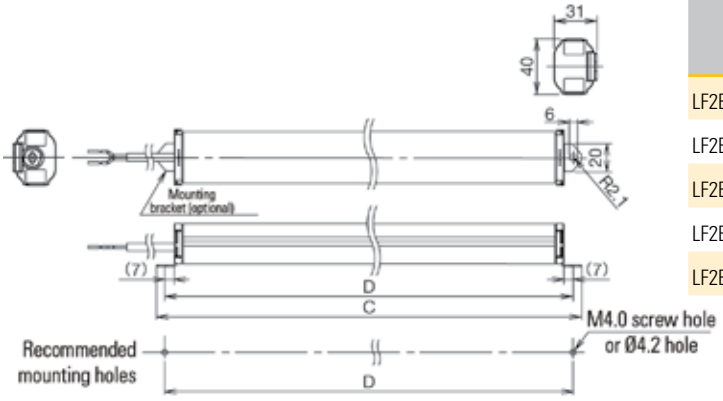
With Mounting Bracket (U-shape): LF9Z-1SB21 (Included in each unit)



Mounting Bracket LF9Z-1SB21



With Mounting Bracket (L-shape): LF9Z-1SB22 (order separately)



Part Number	A		B		C		D		Mounting Bracket Qty. Incl.
	mm	inch	mm	inch	mm	inch	mm	inch	
LF2B-B□P-◇THWW2-1M	165	6.50	–	–	236	9.29	224	8.82	2
LF2B-C□P-◇THWW2-1M	285	11.22	–	–	356	14.02	344	13.54	2
LF2B-D□P-◇THWW2-1M	535	21.06	–	–	606	23.86	594	23.39	2
LF2B-E□P-◇THWW2-1M	785	30.91	393	15.47	856	33.70	844	33.23	3
LF2B-F□P-◇THWW2-1M	1,035	40.75	345	13.58	1,106	43.54	1,094	43.07	4

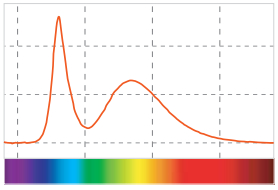
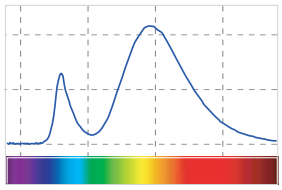
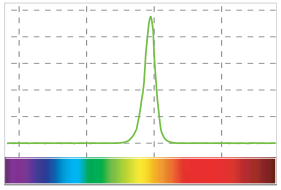
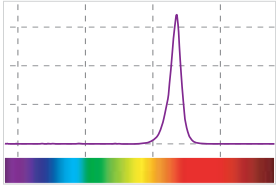
LF1A Series

Key features:

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 saving: One-third of fluorescent lamps
- Long life: 40,000 Hrs (Half-life)
- UL Listed
- RoHS Compliant
- IP40

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)

L F 1 A – 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

Specifications

Model		LF1A-*-2THWW6	LF1A-*-2TLWW6	LF1A-*-2SHY8	LF1A-*-2SHR8
Rated Voltage		24V DC (non-polarized) , Voltage range (21.6 - 26.4V DC)			
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)		40,000 hours			
Weight (approx.)		LF1A-A1: 190g, LF1A-B1: 270g, LF1A-D1: 470g			
Degree of Protection		IP40			

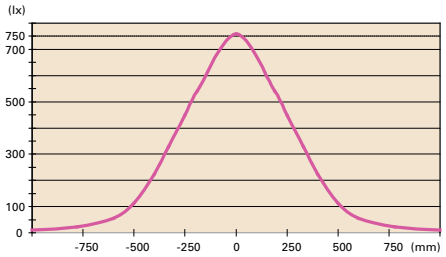
*LED Array A1 = 3x2 , B1 = 6x2, D1 = 12x2

LED Optical Specifcations

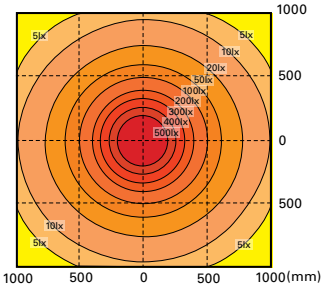
Model		LF1A-*-2THWW6	LF1A-*-2TLWW6	LF1A-*-2SHY8	LF1A-*-2SHR8
Illumination Color		Cool White	Warm White	Yellow	Red
Luminous Intensity (Single LED module)		6,000mcd	4,000mcd	4,000mcd	2,500mcd
Color Temperature / Dominant Wavelength		5,500K	2,800K	590nm	625nm
Reference Illuminance at 0.5m	LED Array 3 x 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

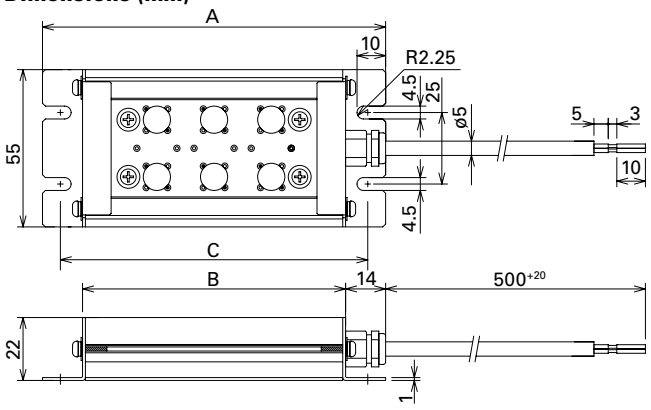
Light Distribution at 0.5m LF1A-D1-THWW6 (Cool White)



Illuminance Chart LF1A-D1-2THWW6

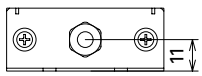


Dimensions (mm)



Dimension Table

Part No.	A		B		C	
	mm	inch	mm	inch	mm	inch
LF1A-A1-	120	4.72	92	3.62	108	4.25
LF1A-B1-	180	7.09	152	5.98	168	6.61
LF1A-D1-	300	11.81	272	10.71	288	11.34



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

Key features:

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

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

Part Numbers

LF1D

Model			Slim Model (10 LEDs × 1 row)		Wide Model (7 LEDs × 2 rows)	
Cable Gland	Cable	Mounting Bracket	Clear Reinforced Glass	Clear Polycarbonate	Clear Reinforced Glass	Clear Polycarbonate
Appearance						
Without (Cable gland hole on the side)	—	— √	LF1D-E②2F-2W LF1D-E②2F-2W-101	LF1D-E②3G-2W LF1D-E②3G-2W-101	LF1D-F②2F-2W LF1D-F②2F-2W-101	LF1D-F②3G-2W LF1D-F②3G-2W-101
Without (Cable gland hole on the back)	—	— √	LF1D-E②2F-2W-200 LF1D-E②2F-2W-201	LF1D-E②3G-2W-200 LF1D-E②3G-2W-201	LF1D-F②2F-2W-200 LF1D-F②2F-2W-201	LF1D-F②3G-2W-200 LF1D-F②3G-2W-201
With (Side)	—	— √	LF1D-E②2F-2W-300 LF1D-E②2F-2W-301	LF1D-E②3G-2W-300 LF1D-E②3G-2W-301	LF1D-F②2F-2W-300 LF1D-F②2F-2W-301	LF1D-F②3G-2W-300 LF1D-F②3G-2W-301
	√	— √	LF1D-E②2F-2W-350 LF1D-E②2F-2W-A	LF1D-E②3G-2W-350 LF1D-E②3G-2W-A	LF1D-F②2F-2W-350 LF1D-F②2F-2W-A	LF1D-F②3G-2W-350 LF1D-F②3G-2W-A
With (Back)	—	— √	LF1D-E②2F-2W-400 LF1D-E②2F-2W-401	LF1D-E②3G-2W-400 LF1D-E②3G-2W-401	LF1D-F②2F-2W-400 LF1D-F②2F-2W-401	LF1D-F②3G-2W-400 LF1D-F②3G-2W-401
	√	— √	LF1D-E②2F-2W-450 LF1D-E②2F-2W-451	LF1D-E②3G-2W-450 LF1D-E②3G-2W-451	LF1D-F②2F-2W-450 LF1D-F②2F-2W-451	LF1D-F②3G-2W-450 LF1D-F②3G-2W-451

LF2D

Model			Slim Model (10 LEDs × 1 row)		Wide Model (7 LEDs × 2 rows)	
Cable Gland	Cable	Mounting Bracket	Clear Reinforced Glass	Clear Polycarbonate	Clear Reinforced Glass	Clear Polycarbonate
Appearance						
Without (Cable gland hole on the side)	—	—	LF2D-E②2F-2W	LF2D-E②3G-2W	LF2D-F②2F-2W	LF2D-F②3G-2W
Without (Cable gland hole on the back)	—	—	LF2D-E②2F-2W-200	LF2D-E②3G-2W-200	LF2D-F②2F-2W-200	LF2D-F②3G-2W-200
With (Side)	—	—	LF2D-E②2F-2W-300	LF2D-E②3G-2W-300	LF2D-F②2F-2W-300	LF2D-F②3G-2W-300
	√	√	LF2D-E②2F-2W-A	LF2D-E②3G-2W-A	LF2D-F②2F-2W-A	LF2D-F②3G-2W-A
With (Back)	—	—	LF2D-E②2F-2W-400	LF2D-E②3G-2W-400	LF2D-F②2F-2W-400	LF2D-F②3G-2W-400
	√	—	LF2D-E②2F-2W-450	LF2D-E②3G-2W-450	LF2D-F②2F-2W-450	LF2D-F②3G-2W-450

In place of ② specify Standard (blank) or High-Luminance models (H).

Part Number Structure (use for interpreting part numbers only)

LF 2 D – E H 2 F – 2W – 300

Shape
1: Surface mount
2: Recessed mount

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

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

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

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

Cable Gland

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

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

Specifications

Model	Standard		High-Luminance	
	Slim	Wide	Slim	Wide
Rated Voltage	24V DC			
Voltage Range	21.6 to 26.4V DC			
Rated Power (typ.)	9W	12.5W	11W	12.5W
Insulation Resistance	1MΩ minimum (500V DC megger)			
Dielectric Strength	1,000V AC, 50/60Hz, 1 minute			
Vibration Resistance (damage limits)	Frequency 5 to 55Hz, amplitude 0.5mm			
Shock Resistance (damage limits)	1000m/s^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 (LF2D: reinforced glass), IP67 (LF2D: polycarbonate), IP67, 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.)	LF1D-E*-2W*: 750g LF1D-E*-2W-A*: 950g LF2D-E*-2W*: 850g LF2D-E*-2W-A*: 1,000g	LF1D-F*-2W*: 800g LF1D-F*-2W-*: 1,000g LF2D-F*-2W*: 900g LF2D-F*-2W-A*: 1,050g	LF1D-E*-2W*: 750g LF1D-E*-2W-A*: 950g LF2D-E*-2W*: 850g LF2D-E*-2W-A*: 1,000g	LF1D-F*-2W*: 800g LF1D-F*-2W-*: 1,000g LF2D-F*-2W*: 900g LF2D-F*-2W-A*: 1,050g

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

LED Optical Specifcations

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

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

Brightest in its class
The optical design ensures extreme brightness. Achieves illuminance specified by EN1837: 1999, 4.2.

Cover (LF1D) - Stainless Steel
Flange Cover (LF2D) - Diecast Aluminum
Both covers are extremely durable, perfect for harsh environments.

Glare prevention
Diffused model available to prevent glaring light and reflection. (EN1837: 1999, 4.3.)

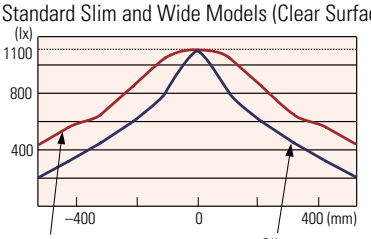
Housing
Aluminum.

Heat dissipation
Heat is dissipated by the aluminum housing.

Efficient power circuit
Highly efficient, low-heat power circuit.

Distribution Characteristics (reference value at 1.0m)

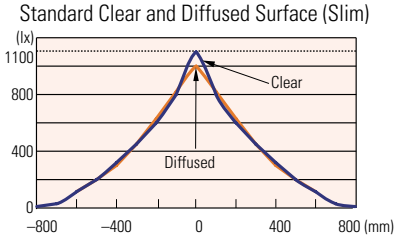
Standard Slim and Wide Models (Clear Surface)



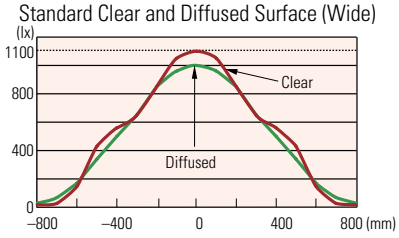
Wide
(Illuminates wide-ranging area)

Slim
(Illuminates area directly below)

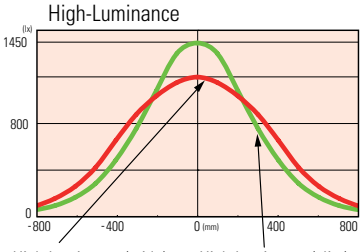
Standard Clear and Diffused Surface (Slim)



Standard Clear and Diffused Surface (Wide)



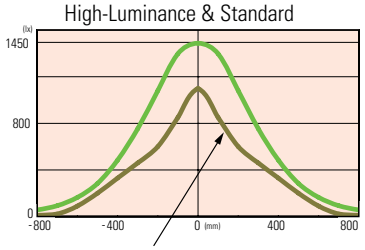
High-Luminance



High-Luminance (wide)
(Illuminates a large area with ultra bright light)

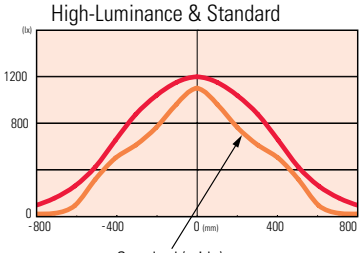
High-Luminance (slim)
(Illuminates directly below and the surrounding area)

High-Luminance & Standard



Standard (slim)
(Illuminates area directly below)

High-Luminance & Standard



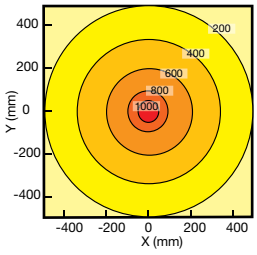
Standard (wide)
(Illuminates large area)

Illuminance Charts

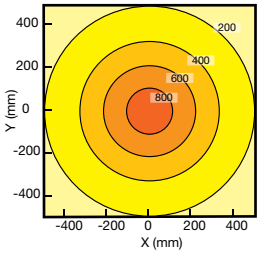
Standard

Slim

Clear Surface

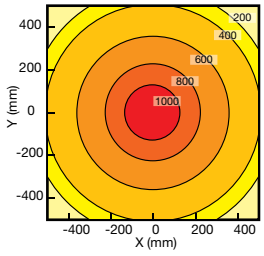


Diffused Surface

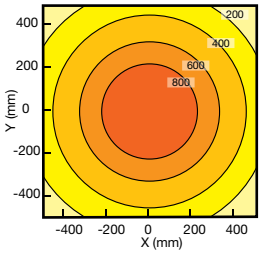


Wide

Clear Surface

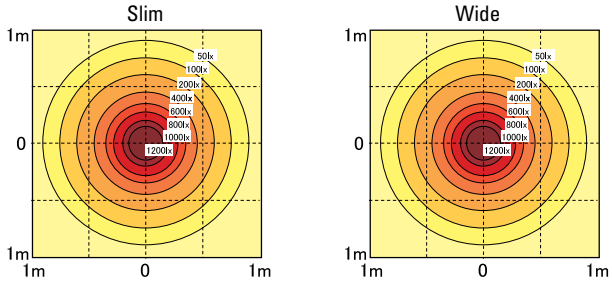


Diffused Surface



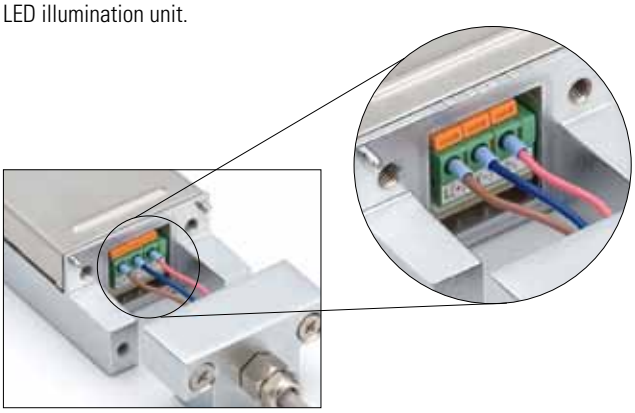
X: long side
Y: short side

High-Luminance

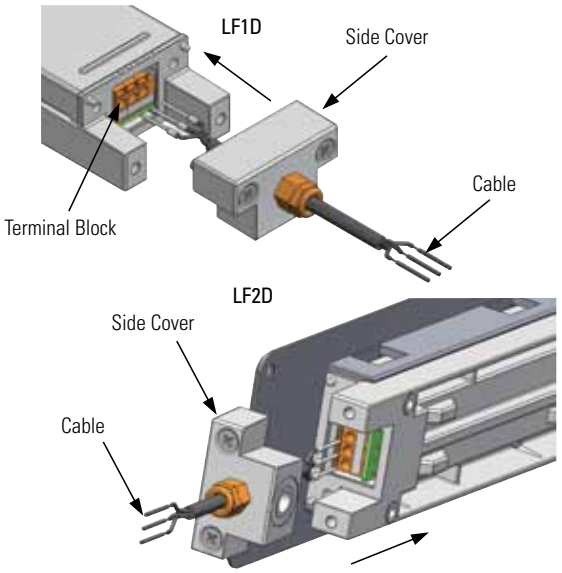


Easy Maintenance
Spring-clamp Terminal Blocks

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

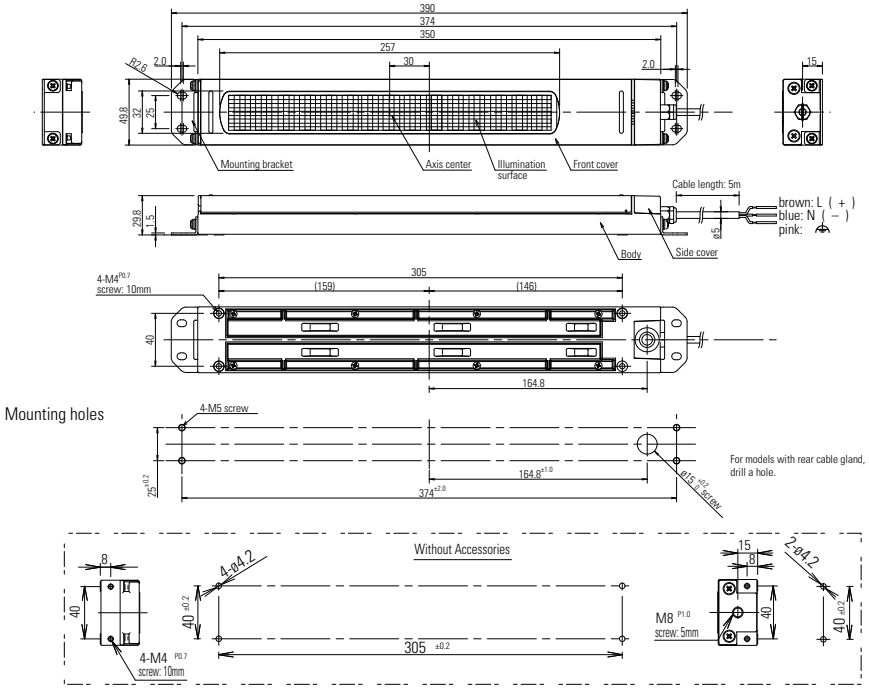


Connection Example

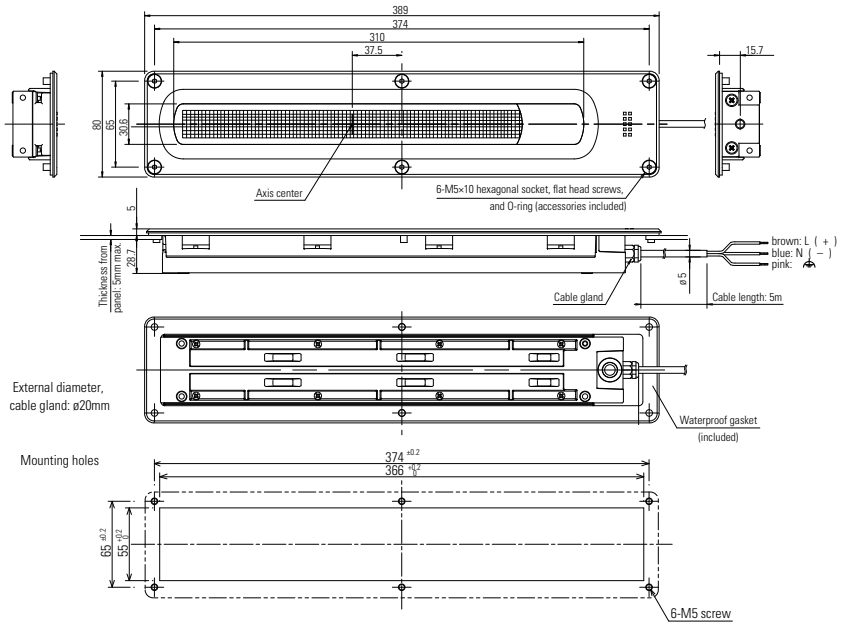


Dimensions (mm)

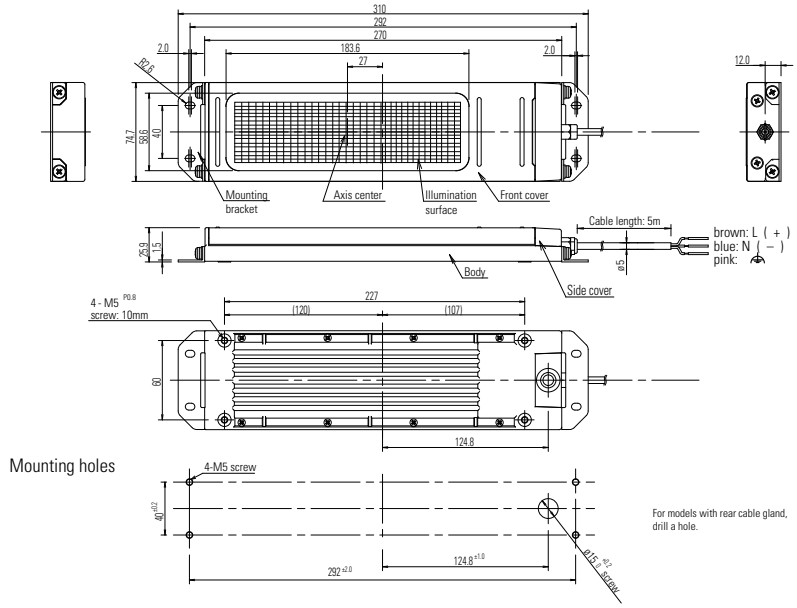
LF1D Slim



LF2D Slim

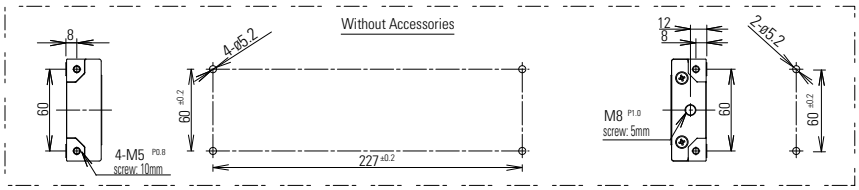


LF1D Wide

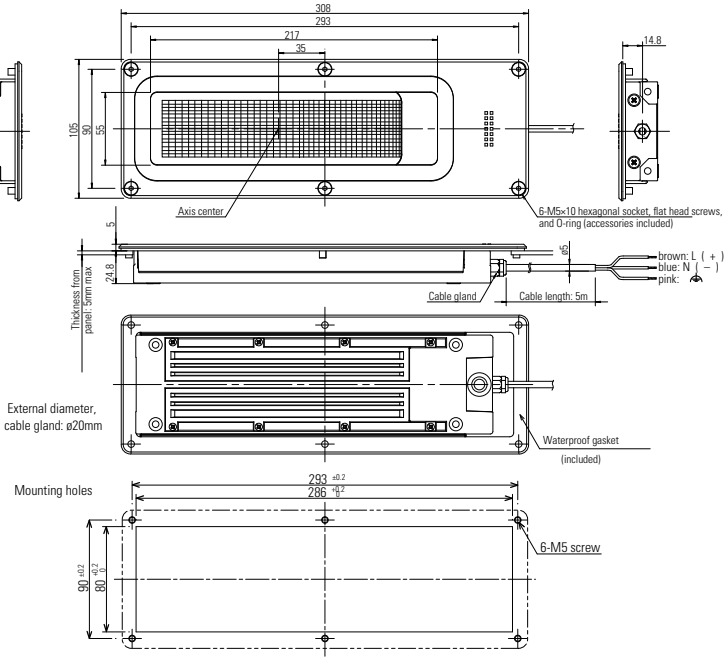


Mounting holes

For models with rear cable gland, drill a hole.



LF2D Wide


308
293
217
35
14.8
105
90
55
Axis center
6-M5×10 hexagonal socket, flat head screws,
and O-ring (accessories included)
5
24.8
Thickness from
panel: 5mm max
φ6
brown: L (+)
blue: N (−)
pink:
Cable gland
Cable length: 5m
External diameter,
cable gland: ø20mm
Waterproof gasket
(included)
Mounting holes
293 ±0.2
286 +0.2 0
6-M5 screw
90 ±0.2
80 +0.2 0

LF1E Series

Key features:

The LF1E illumination lights are designed to be used in freezers or refrigerated display cases where the ambient temperature is as low as -40°C. These energy saving units, with a long service life, compact size and low heat generation make them perfect for illuminating areas with very low temperatures.

- Three types of light distribution: no-lens, condensing lens and dual lens
- Life: 70% of initial luminance at 40,000 Hrs
- Available in 4 lengths
- Plastic lenses suitable for food industry
- IP54 protection against dust and water
- CE marked, UL Listed (damp locations)

Part Numbers

LF1E-B3S-2*† (550mm)	LF1E-C3S-2*† (808mm)	LF1E-D3S-2*† (1066mm)	LF1E-E3S-2*† (1450mm)
 warm white shown	 cool white shown	 cool white shown	 cool white shown

* N = Cool white, L: Warm white. † Blank = No lens, A = Condensing Lens, B = Dual Lens.

Part Number Structure (use for interpreting part numbers only)

LF1E– B 3 S–2 N A

- Length (mm): B: 550 (21.65"), C: 808 (31.81"), D: 1,066 (41.97"), E: 1,450 (57.09")
- LED Color: N: Cool white (5,000K equivalent), L: Warm white (3,000K equivalent)
- Light Distribution (lens type): Blank: No Lens, A: Condensing Lens, B: Dual Lens

Note: Mounting brackets included

Specifications

Model (length)		LF1E-B (550mm)	LF1E-C (808mm)	LF1E-D (1066mm)	LF1E-E (1450mm)
Rated Voltage		24V DC (Voltage range: 21.6 - 26.4VDC)			
Input Current (at rated voltage)	24V DC	350mA (404mA max)	525mA (606mA max)	700mA (807mA max)	950mA (1004mA max)
Power Consumption (typ. at rated input)	24V DC	8.4W (9.7W max)	12.6W (14.6W max)	16.8W (19.4W max)	22.8W (26.3W max)
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 55Hz, amplitude 0.17mm			
Shock Resistance (damage limits)		300m/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 Environment		No corrosive gases			
Life		40,000 hours (The illumination duration in which the illuminance maintains a minimum of 70% of the initial value at 25°C.)			
Weight (approx.) [1]		275g	390g	515g	690g
Degree of protection		IP54			
Material		End cover, conduit: polyamide, Cover: polycarbonate, Cable: PVC, Mounting bracket: stainless steel			

1. Dual lens type.

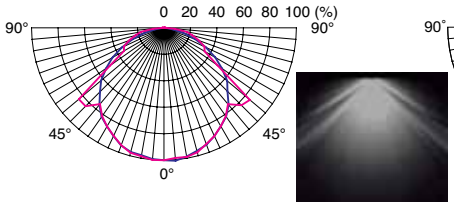
LED Optical Specifcations

Illumination Color		Cool White	Warm White
Color Temperature		5000K	3000K
Lens Type	Unit Length	Reference Illumination	
No Lens [1]	550mm	950lx	750lx
	808mm	1,100lx	900lx
	1066mm	1,200lx	950lx
	1450mm	1,250lx	1,000lx
Condensing Lens [2]	550mm	1,950lx	1,500lx
	808mm	2,000lx	1,550lx
	1066mm	2,000lx	1,550lx
	1450mm	2,000lx	1,550lx
Dual Lens	See Illumination Distrbution Chart		

1. LED life depends on the operating environment.
2. Measured at 0.3m directly below unit.

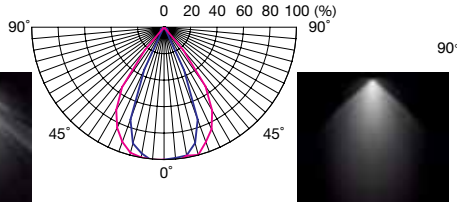
Illuminance Distribution Charts

No-lens



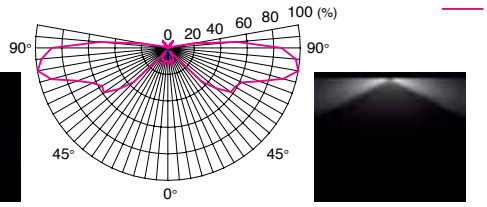
Y (short side) image

Condensing Lens



Y (short side) image

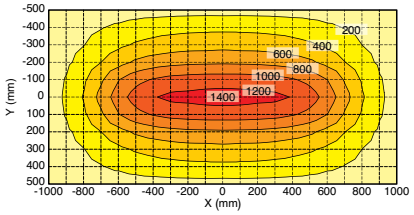
Dual Lens



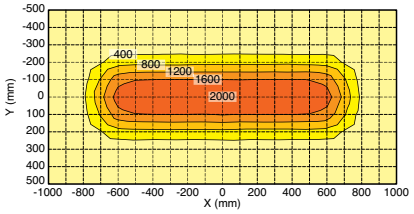
Y (short side) image

Illuminance Charts

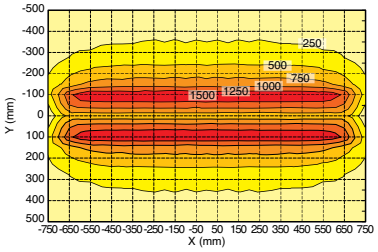
No-lens (LF1E-E3S-2N)



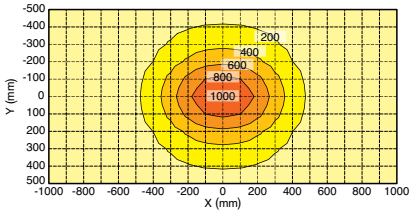
Condensing Lens (LF1E-E3S-2NA)



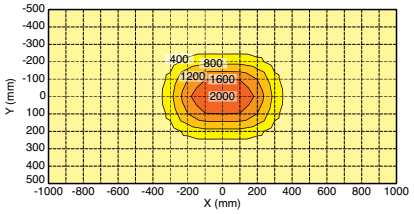
Dual Lens (LF1E-E3S-2NB)



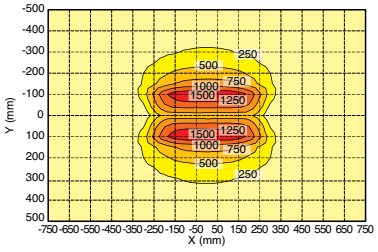
No-lens (LF1E-B3S-2N)



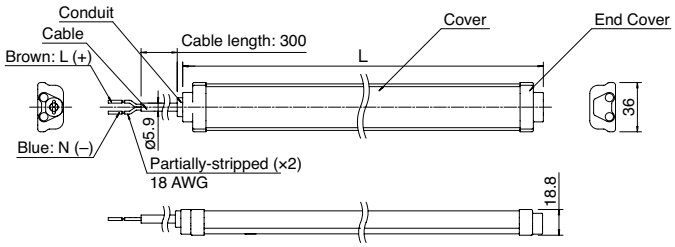
Condensing Lens (LF1E-B3S-2NA)



Dual Lens (LF1E-B3S-2NB)



Dimensions (mm)



Dimension Table

Part No.	L		A		B		C		D		Mounting Bracket Quantity Included
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
LF1E-B3	550	21.65	585	23.03	30	1.18	490	19.29	490	19.29	2
LF1E-C3	808	31.81	843	33.19	29	1.14	750	29.53	375	14.76	3
LF1E-D3	1,066	41.97	1,101	43.35	30.5	1.20	1,005	39.57	335	13.19	4
LF1E-E3	1,450	57.09	1,485	48.46	32	1.26	1,386	54.57	462	18.19	4

LF1F Series

LF1F Key features:

Unlike fluorescent lights, LED lights do not flicker and therefore illuminate objects evenly. Uneven surfaces, such as scratches and flaws, are more visible providing more accurate inspections. The LF1F provides steady light regardless of ambient temperature and the narrow profile saves space allowing mounting flexibility.

- Energy saving
- Long operating life
- Maintenance free
- 12mm-thin bezel saves space
- 300mm square illuminated surface
- Wider operating temperature range than fluorescent lighting

CE

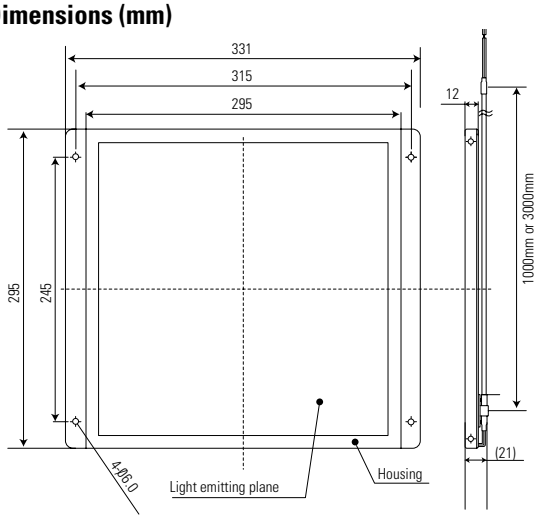
Part Numbers

Appearance	Model	Cable Length	Size	Color Temperature
	LF1F-B4-2D1	1m	300mm square	8,500K
	LF1F-B4-2D3	3m		

Specifications

Model	LF1F
Rated Voltage	24V DC (Voltage range: 21.6 - 26.4V DC)
Wattage (typ.)	11W
Insulation Resistance	100MΩ minimum
Dielectric Strength	1,000V, 50/60Hz, 1 minute
Vibration Resistance	5 ~ 55Hz, amplitude 0.5mm, 60m/s^2 (3 directions, 2 hours each)
Shock Resistance	1,000m/s^2
Operating Temperature	-10° ~ +60 (no freezing)
Operating Humidity	45 ~ 85% RH (no condensation)
Storage Temperature	-20° ~ +70°C (no freezing)
Operating Environment	No corrosive gases, no harmful dust
Life	40,000 hours
Degree of Protection	IP20 (IEC60529)
Materials	Housing: Aluminum, Light emitting part: acrylic; Cover: acrylic
Weight (approx.)	1.1kg

Dimensions (mm)



(Light emitting plane: 271 x 271)

LED Optical Specifcations

Model	LF1F
Color Temperature	8,500K
Reference Illuminance at 1.0m	5,800lx minimum (panel center)

EF1A Series

Key features:

Hazardous locations LED illumination units, EF1A are ideal for locations that require additional protection. With an IP67 rating they can be used in wet locations subject to high pressure spray.

- Hazardous locations LED units (Class 1, Zone 1 and Zone 2 approved)
- Slim or wide models available
- 2 cover colors: clear or white
- Available with adjustable, fixed angle or no mounting bracket
- IP67 (without switch)
- IP65 (with switch)

*UL, ATEX, and IECEx are pending approval.

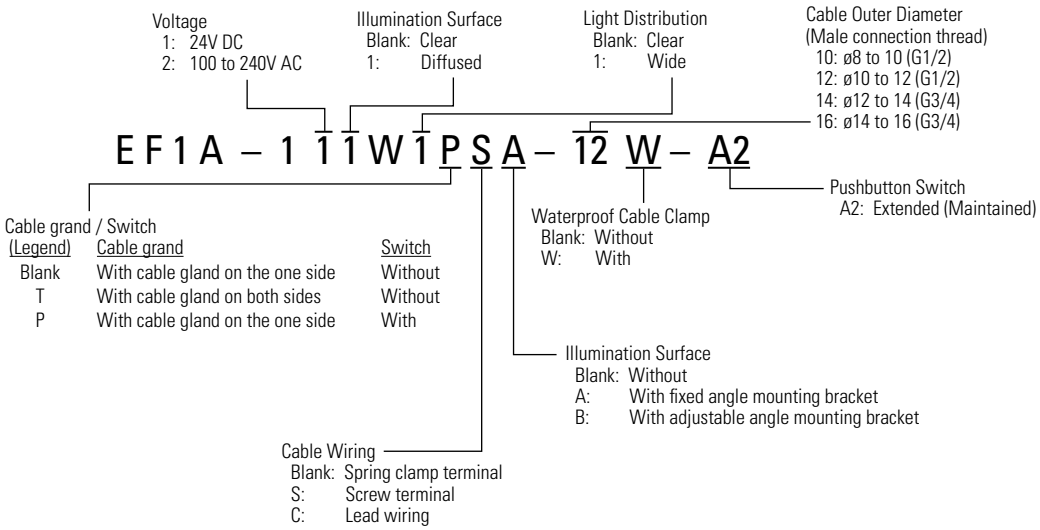
Part Numbers
Without pushbutton switch (IP67)

Rated Voltage	Light Distribution	Mounting Bracket	Waterproof Cable Clamp	Illumination Surface ①	Terminal Block ②	Cable Gland Outer Diameter ③	Part No.
100 to 240V AC	Narrow	Without (4-M6 screw on the back of EF1A)	With	Blank: Clear 1: Diffused	Blank: Spring Clamp Terminal S: Screw Terminal C: Lead Wire	10: ø8-ø10 12: ø10-ø12 14: ø12-ø14 16: ø14-ø16	EF1A-12①W②-③
			Without				EF1A-12①W②-③W
		With (Fixed angle)	With				EF1A-12①W②A-③
			Without				EF1A-12①W②A-③W
		With (Adjustable angle)	With				EF1A-12①W②B-③
			Without				EF1A-12①W②B-③W
	Wide	Without (4-M6 screw on the back of EF1A)	With				EF1A-12①W1 ②-③
			Without				EF1A-12①W1②-③W
		With (Fixed angle)	With				EF1A-12①W1②A-③
			Without				EF1A-12①W1②A-③W
		With (Adjustable angle)	With				EF1A-12①W1②B-③
			Without				EF1A-12①W1②B-③W
24V DC	Narrow	Without (4-M6 screw on the back of EF1A)	With				EF1A-11①W②-③
			Without				EF1A-11①W②-③W
		With (Fixed angle)	With				EF1A-11①W②A-③
			Without				EF1A-11①W②A-③W
		With (Adjustable angle)	With				EF1A-11①W②B-③
			Without				EF1A-11①W②B-③W
	Wide	Without (4-M6 screw on the back of EF1A)	With				EF1A-11①W1②-③
			Without				EF1A-11①W1②-③W
		With (Fixed angle)	With				EF1A-11①W1②A-③
			Without				EF1A-11①W1②A-③W
		With (Adjustable angle)	With				EF1A-11①W1②B-③
			Without				EF1A-11①W1②B-③W

With pushbutton (IP65)

Rated Voltage	Light Distribution	Mounting Bracket	Waterproof Cable Clamp	Illumination Surface	Terminal Block	Cable Gland Outer Diameter	Part No.
100 to 240V AC	Narrow	Without (4-M6 screw on the back of EF1A)	With	Blank: Transparent 1: Translucent	Blank: Spring Clamp Terminal S: Screw Terminal C: Lead Wire	10: ø8-ø10 12: ø10-ø12 14: ø12-ø14 16: ø14-ø16	EF1A-12①WP②-③-A2
			Without				EF1A-12①WP②-③W-A2
		With (Fixed angle)	With				EF1A-12①WP②A-③-A2
			Without				EF1A-12①WP②A-③W-A2
		With (Adjustable angle)	With				EF1A-12①WP②B-③-A2
			Without				EF1A-12①WP②B-③W-A2
	Wide	Without (4-M6 screw on the back of EF1A)	With				EF1A-12①W1P②-③-A2
			Without				EF1A-12①W1P②-③W-A2
		With (Fixed angle)	With				EF1A-12①W1P②A-③-A2
			Without				EF1A-12①W1P②A-③W-A2
		With (Adjustable angle)	With				EF1A-12①W1P②B-③-A2
			Without				EF1A-12①W1P②B-③W-A2
24V DC	Narrow	Without (4-M6 screw on the back of EF1A)	With				EF1A-11①WP②-③-A2
			Without				EF1A-11①WP②-③W-A2
		With (Fixed angle)	With				EF1A-11①WP②A-③-A2
			Without				EF1A-11①WP②A-③W-A2
		With (Adjustable angle)	With				EF1A-11①WP②B-③-A2
			Without				EF1A-11①WP②B-③W-A2
	Wide	Without (4-M6 screw on the back of EF1A)	With				EF1A-11①W1P②-③-A2
			Without				EF1A-11①W1P②-③W-A2
		With (Fixed angle)	With				EF1A-11①W1P②A-③-A2
			Without				EF1A-11①W1P②A-③W-A2
		With (Adjustable angle)	With				EF1A-11①W1P②B-③-A2
			Without				EF1A-11①W1P②B-③W-A2

Part Number Structure (use for interpreting part numbers only)



General Specifcations

Model	EF1A -11	EF1A -12
Explosion protection	Ex d II C T4	
Zone	Zone 1, Zone 2	
Rated voltage	24V DC	100 to 240V AC
Voltage Range	18 to 26.4V DC	85 to 264V AC
Rated Power (Typ.)	16W (at rated voltage)	19W (at rated voltage)
Insulation Resistance	100MΩ minimum (500V DC megger) input - FG	
Dielectric Strength	2000V AC 1 minute input - FG	
Vibration Resistance (damage limits)	Frequency 5 to 55 Hz, amplitude 0.5mm	
Shock Resistance (damage limits)	1000 m/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	50,000 hours (The illumination duration in which the brightness maintains a minimum of 70% of initial value at 25°C)	
Degree of Protection	IP67 (IEC 60529), IP65 (with pushbutton switch)	
Material	Housing: aluminum, front panel: stainless steel, mounting bracket: stainless steel Illumination surface: reinforced glass, cable gland: nickel-plated brass	
Weight (approx.)	3.2Kg (without mounting bracket), 3.4Kg (with mounting bracket)	

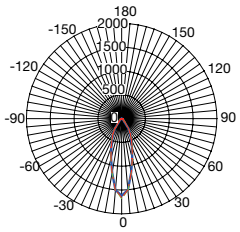
LED Optical Specifcations

Illumination Surface	Clear		Diffused	
Collecting Lens (Light Distribution)	With	Without	With	Without
Illumination Color	White			
Color Temperature (typ.)	5700 K			
Total Luminous Flux (typ.)	960 lm			
Reference Illuminance (typ.) At 1.0m directory below	1100 lx	450 lx	205 lx	175 lx

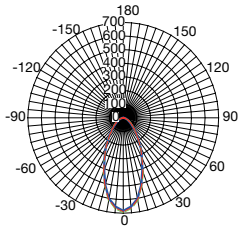
Light Distribution (cd/1000lm)

Narrow light distribution type

Illumination surface: clear glass

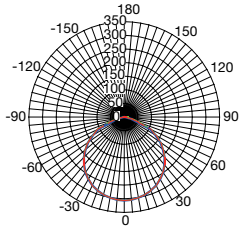


Illumination surface: diffused glass

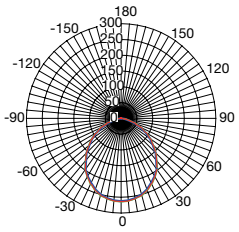


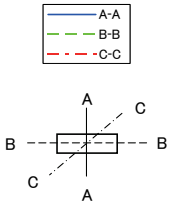
Wide light distribution type

Illumination surface: clear glass



Illumination surface: diffused glass

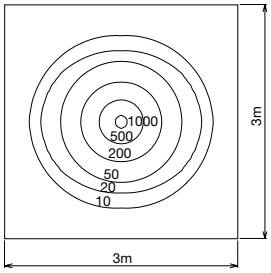




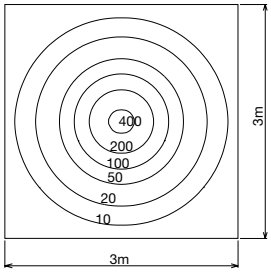
Illuminance Distribution (at 1.0m)

Narrow light distribution type (lx)

Illumination surface: clear glass

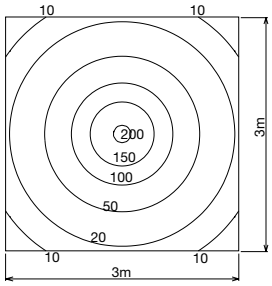


Illumination surface: diffused glass

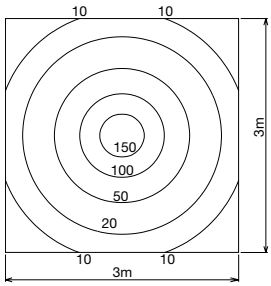


Wide light distribution type (lx)

Illumination surface: clear glass

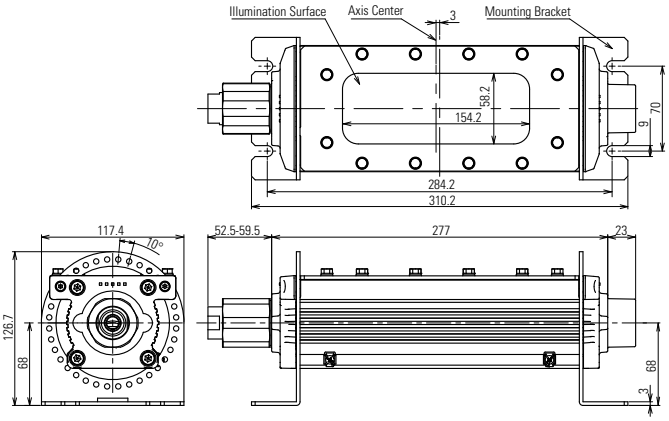


Illumination surface: diffused glass

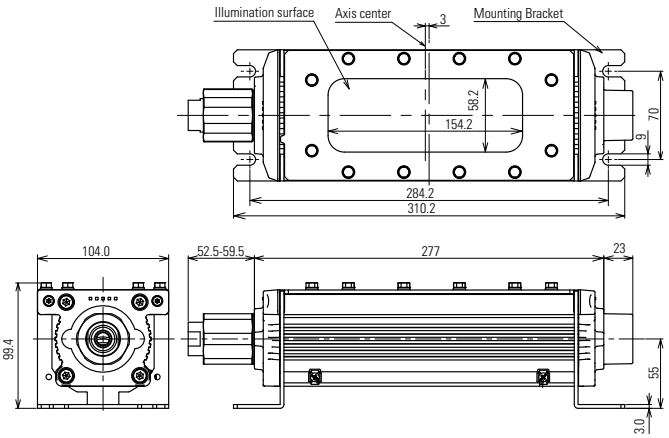


Dimensions (mm)

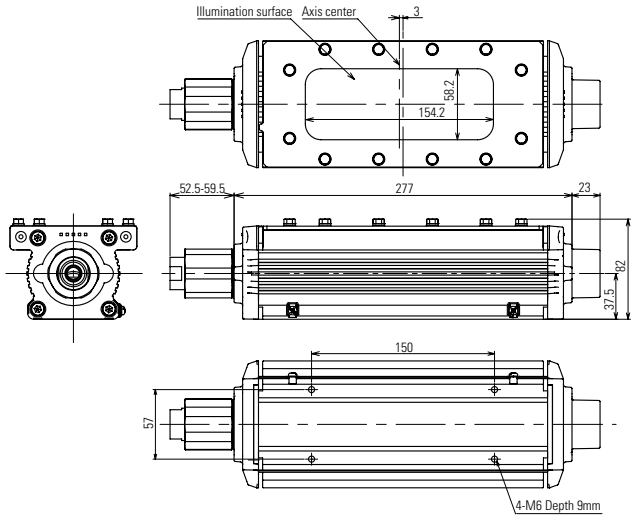
With adjustable angle mounting bracket



With fixed angle mounting bracket

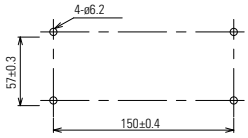


Without mounting bracket

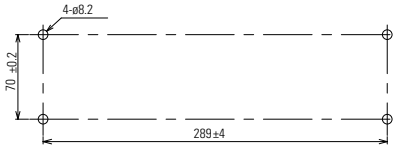


Mounting Hole Layout

Without mounting bracket



With mounting bracket

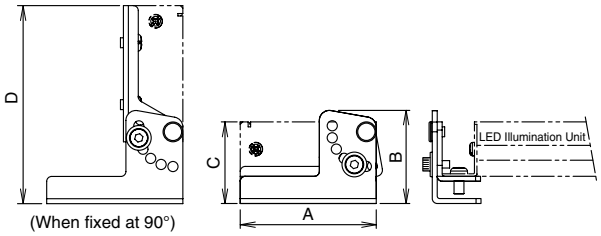


Accessories

Item	Mounting Bracket							Cable Gland	Cable
Part No.	LF9Z-1MB1	LF9Z-1MA1	LF9Z-B12	LF9Z-B11	LF9Z-1MDE1	LF9Z-1MDF1	LF9Z-1SE1	LF9Z-A11	LF9Z-C05
Applicable Unit	LF1B-NA, -B, -C (-D not applicable)	LF1A-A, -B, -D	LF1D (Slim)		LF1D (Wide)		LF1E	LF1D	LF1D
Material	Stainless Steel							Brass	PVC
Notes	1 pair Left and Right						1 piece	M8, applicable wire size (10-12 AWG)	Length: 5m

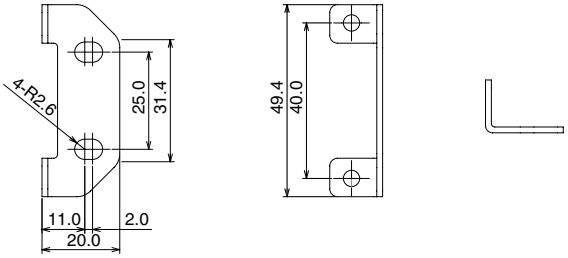
Dimensions (mm)

LF9Z-1MB1/1MA1

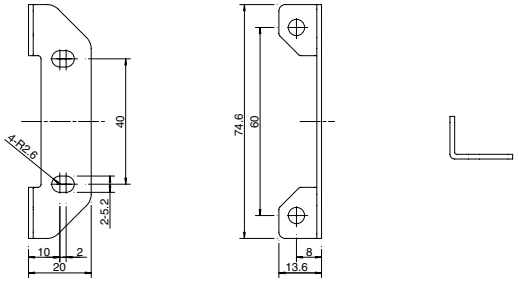


Part No.	A		B		C		D	
	mm	inch	mm	inch	mm	inch	mm	inch
LF9Z-1MB1	27.5	1.08	35.2	1.39	27	1.06	50.5	1.99
LF9Z-1MA1	55	2.17	37.9	1.49	33	1.30	80	3.15

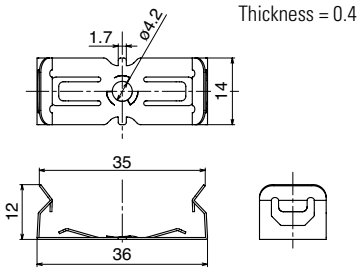
LF9Z-B11



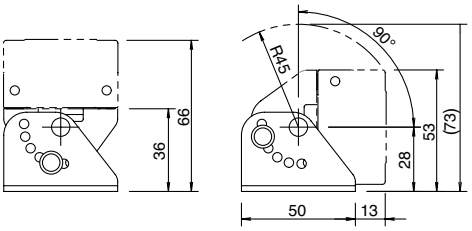
LF9Z-B12



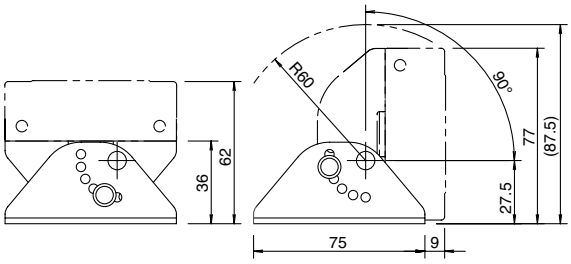
LF9Z-1SE1



LF9Z-1MDE1



LF9Z-1MDF1



Safety Precautions

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

Instructions

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