

EF1A Flameproof LED Illumination Units

Hazardous location lighting for use in areas where explosive gases and combustible dusts exist.

- Can be used in hazardous areas of Zone 1 and 2.
- Heavy-duty aluminum housing with reinforced glass.
- 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
- IP67 (NEMA 4X) without switch
- IP65 (NEMA 3S) with switch

Explosion-proof Class

Ex d IIB T4 Gb
Ex tb IIIC T130° Db

IECEX



Without ON/OFF Switch (IP67)

Package quantity: 1

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

With ON/OFF Switch (IP65)

Rated Voltage	Optical Dispersion	Mounting Bracket	Lens Type ①	Conduit Entry ②	Termination Type ③	Conduit Size (Male connection thread)④	Part No.
100 to 240V AC	Narrow	Without (4-M6 screw on the back of EF1A)	Blank: Clear glass 1: Diffused glass	P: One Side (Another Side Switch) *	Blank: Spring Clamp Terminal S: Screw Terminal C: Lead Wire	N1: 1/2" NPT N2: 3/4" NPT M25: M25 (P1.5) M32: M32 (P1.5)	EF1A-12①WP③-④-A2
		With (Fixed angle)					EF1A-12①WP③A-④-A2
		With (Fixed angle)					EF1A-12①WP③B-④-A2
	Wide	With (Fixed angle)					EF1A-12①W1P③-④-A2
		With (Fixed angle)					EF1A-12①W1P③A-④-A2
		With (Adjustable angle)					EF1A-12①W1P③B-④-A2
24V DC	Narrow	Without (4-M6 screw on the back of EF1A)	Blank: Clear glass 1: Diffused glass	P: One Side (Another Side Switch) *	Blank: Spring Clamp Terminal S: Screw Terminal C: Lead Wire	N1: 1/2" NPT N2: 3/4" NPT M25: M25 (P1.5) M32: M32 (P1.5)	EF1A-11①WP③-④-A2
		With (Fixed angle)					EF1A-11①WP③A-④-A2
		With (Adjustable angle)					EF1A-11①WP③B-④-A2
	Wide	Without (4-M6 screw on the back of EF1A)					EF1A-11①W1P③-④-A2
		With (Fixed angle)					EF1A-11①W1P③A-④-A2
		With (Adjustable angle)					EF1A-11①W1P③B-④-A2

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

- Switches & Pilot Lights
- Flush Silhouette Switches
- Emergency Stop Switches
- Control Stations
- Display Lights
- Operator Interfaces
- PLCs
- Softwares
- Relays
- Sockets
- Timers
- Terminal Blocks
- Circuit Protectors
- Power Supplies
- Sensors
- Ex-proof Control Boxes
- Barriers
- LEDs
- Safety Products
- Information

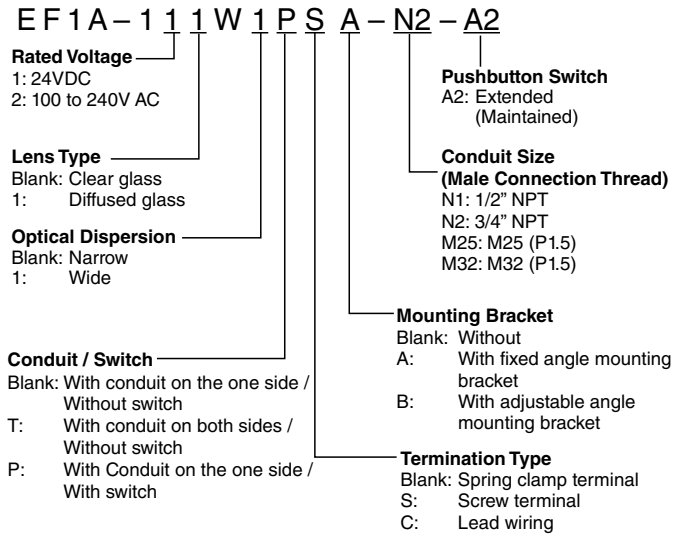
EF1A Flameproof LED Illumination Units

Specifications

Part No.	EF1A-12	EF1A-11
Rated Voltage	100 to 240V AC	24V DC
Voltage Range	90 to 264V AC	21.6 to 26.4V DC
Power Consumption (typ.) (at rated voltage)	19W	17W
Dielectric Strength	2000V AC 1 minute input- FG	500V AC 1 minute input-FG
Insulation Resistance	100MΩ minimum (500V DC megger) (between input and ground)	
Dielectric Strength	2,000V AC, 1 minute (between input and ground)	
Vibration Resistance (damage limits)	Frequency 5 to 55 Hz, amplitude 0.5mm	
Shock Resistance (damage limits)	1,000 m/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 (Note)	Approx. 50,000 hours minimum (The total illumination duration where the illuminance maintains a minimum of 70% of the initial value in 25°C environment.)	
Material	Housing: aluminum Front panel: stainless steel Mounting bracket: stainless steel Lens surface: reinforced glass	
Weight (approx.)	2.9 kg (without mounting bracket) 3.1 kg (with mounting bracket)	

Note: LED life depends on the operating environment.

Part No. Development



LED Optical Specifications

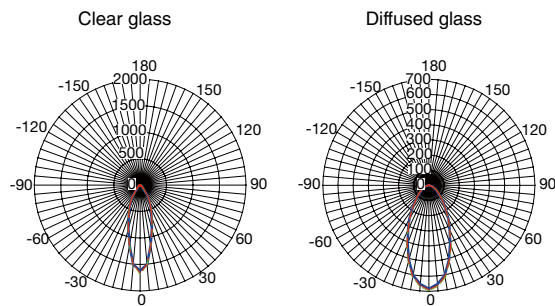
Lens Type	Clear		Diffused	
	With	Without	With	Without
Collecting Lens (Optical Dispersion)				
Color Temperature (typ.)	5,700K (Cool White)			
Total Luminous Flux (typ.)	960 lm			
Reference Illuminance (typ.) (at 1.0m directly below)	1100 lx	450 lx	205 lx	175 lx

Certifications and Compliances

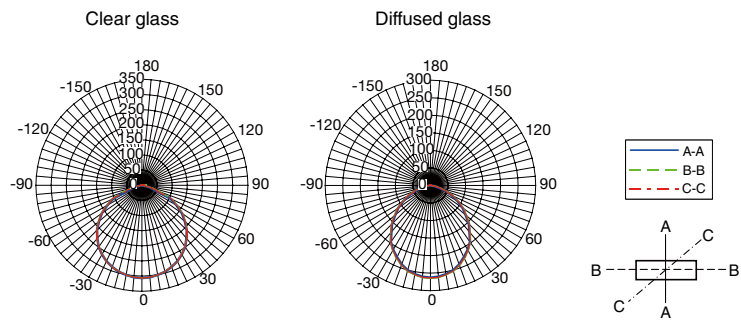
IEC and ATEX (94/9/EC)	NEC and CEC
Zones 1 & 21 and 2 & 22	Class I, Zone 1, Group IIB
ATEX: II 2G Ex d IIB T4 Gb II 2D Ex tb IIIC T 130°C Db IP67 (or IP65)	UL: Class I, Zone 1, AEx d IIB T4 Gb
IECEX: Ex d IIB T4 Gb Ex tb IIIC T 130°C Db IP67 (or IP65)	cUL: Ex d IIB T4 Gb X
Certificate No.: DEMKO 14 ATEX 1208667X IECEX UL 14.0048X	Certificate/File No.: UL/cUL E353024

Optical Dispersion (cd/1000lm)

Narrow

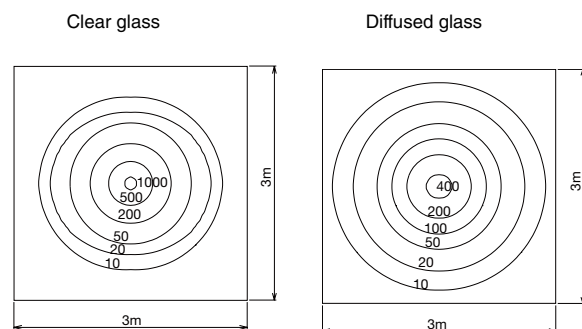


Wide

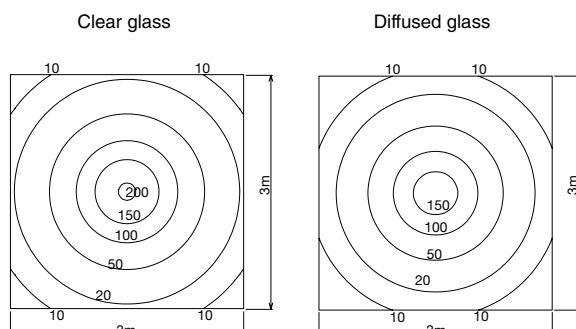


Illuminance Distribution at 1.0m (reference value)

Narrow (lx)



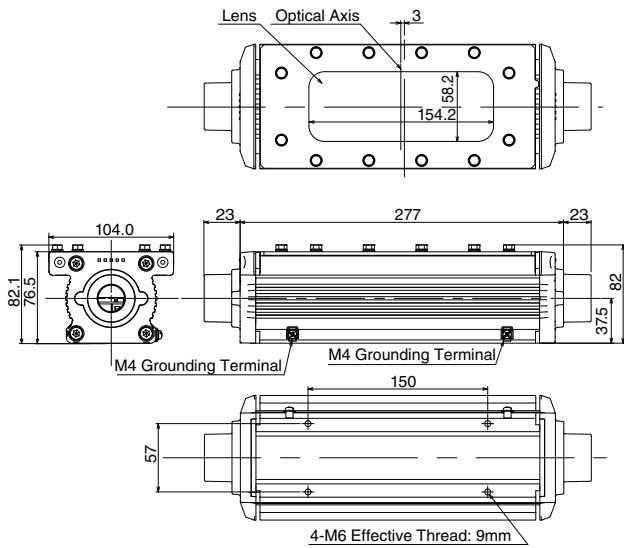
Wide (lx)



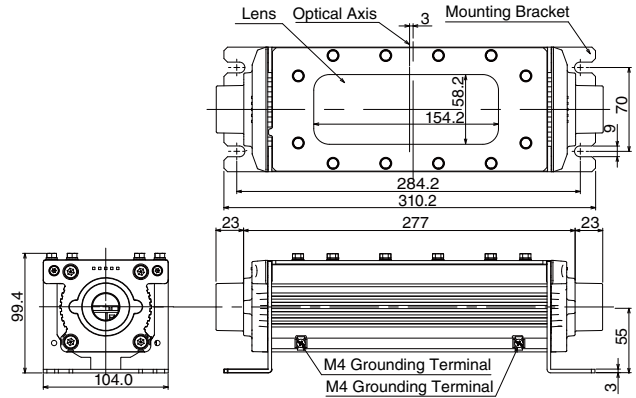
EF1A Flameproof LED Illumination Units

Dimensions

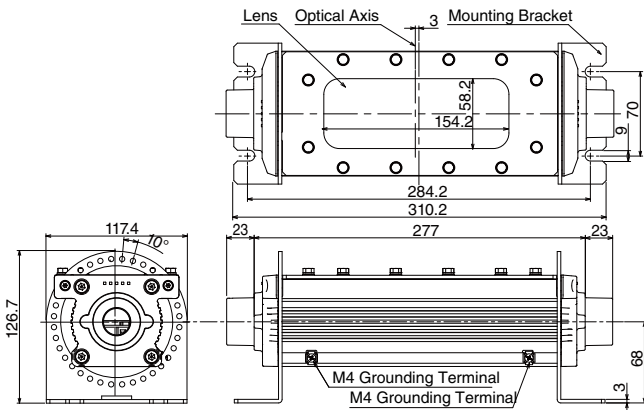
Direct Mounting



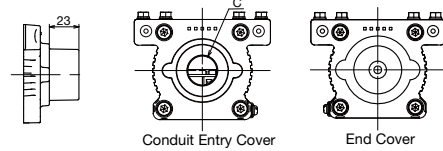
Without Mounting Bracket



With Angle Adjustable Bracket

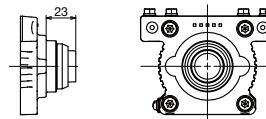


Conduit Entry Cover / End Cover



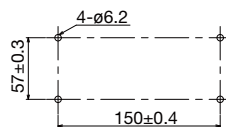
Conduit Entry Size	C
N1	1/2" NPT
N2	3/4" NPT
M25	M25 ^{P1.5}
M32	M32 ^{P1.5}

With ON/OFF Switch

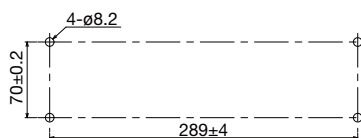


Mounting Hole Layout

Direct Mounting (Without Mounting Bracket)



Direct Mounting (Fixed Angle Adjustment Bracket)



All dimensions in mm.

Switches & Pilot Lights

Flush Silhouette Switches

Emergency Stop Switches

Control Stations

Display Lights

Operator Interfaces

PLCs

Softwares

Relays

Sockets

Timers

Terminal Blocks

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Power Supplies

Sensors

Ex-proof Control Boxes

Barriers

LEDs

Safety Products

Information

EF1A Flameproof LED Illumination Units



Safety Precautions

- Do not disassemble, repair, or modify the LED illumination unit. Otherwise electric shock, fire, or malfunction may occur.
- Special expertise is required to install, operate, maintain, and inspect the EF1A. People without such expertise must not use the

EF1A. Otherwise electric shocks, damage, or malfunction may result.

- Read this catalog and instruction sheet carefully before using the EF1A.

Instructions

Installation

Installation Area

1. The EF1A can be used in Zone 1 and 2. Do not use in 0.
2. Operating temperature is -20 to $+50^{\circ}\text{C}$. When the surface temperature of EF1A might exceed $+50^{\circ}\text{C}$ due to direct sunlight, provide a shade to keep the surface temperature below $+50^{\circ}\text{C}$.

Installation

1. Direct mounting:
Use four M6 bolts or install firmly so that equivalent mounting strength is provided.
Mounting bracket: 3mm thick (see dimensions on page U-27)
2. If bolt loosening is expected, use spring washers.
Recommended tightening torque:
M6: 3.9 to 5.4 N·m, M8: 10 to 13.5 N·m.
3. If corrosion on bolts is expected, use anti-corrosion bolts.

Installing/removing the cover

1. When removing the cover, use a hexagon wrench (size: 5) supplied with the EF1A to remove the cover bolts (hex socket head cap bolt). Do not lose the end cover bolts. Hex socket head cap bolts made of stainless steel (M6x18, with spring washer and plain washer) are used.
2. The cover is inserted into the housing. When installing or removing the cover, make sure that the cover is inserted or removed straight.
3. When installing the cover, observe the following:
 - No foreign objects on the gasket or on joint surface.
 - The gasket is in place.
 - The wires are not caught between the joint surfaces.
 Install the cover carefully and tighten screws securely to a torque of 3.9 to 5.4 N·m.
(Note) Check that the bolts are tightened securely.

Notes on ON/OFF Switch Models

1. Push the ON/OFF switch to turn on, and push further to turn off. The EF1A may need a few seconds to turn on after the ON/OFF switch is pushed.
2. Do not remove the cover of the EF1A which has ON/OFF switch installed. Mounting brackets cannot be removed or installed by the user.
3. For direct mounting of the EF1A with ON/OFF switch, the mounting bracket cannot be installed by the user. If mounting bracket is necessary, contact IDEC.

Protective Grounding

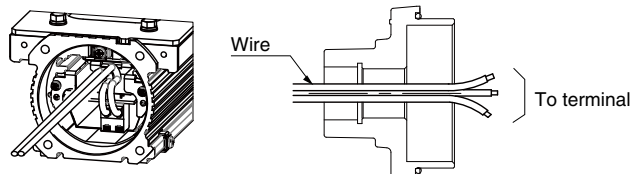
- Ground the EF1A according to the environment and ratings of the application. Observe the regulations of the relevant country or region where the EF1A is used.
- Use the M4 grounding terminal inside the EF1A and make sure that the ground resistance value is under 100Ω .
- When not using the M4 grounding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

Wiring

Applicable Wire

- Stranded wire: 0.5 to 2.0 mm², Solid wire: $\phi 0.5$ to $\phi 2.0$ mm² (AWG20-14)
- Do not connect more than two wires to one terminal. When connecting an insulated wire to the terminal block, use a crimping terminal with insulation sheath. Bare crimping terminal must be insulated with an insulation tube or marking tube. Make sure not

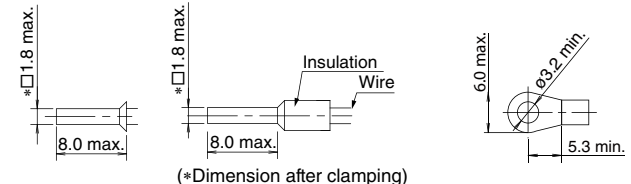
to apply excessive force to the terminal block when installing the end cover.
Use a heat resistance wire (70°C minimum).



Applicable Crimping Terminal

Spring Clamp Terminal (WAGO: 741-302) **Screw Terminal (Ferrule)**
(Ring Terminal)

Without Insulation With Insulation



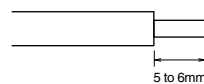
Recommended ferrule (WAGO)

For example: when the applicable wire diameter is 1.0mm²
Ferrules with insulation: 216-223
Ferrules without insulation: 216-103
Crimping tool: 206-204

Wiring the Spring Clamp Terminal

1. Insert a screwdriver into the slot to open the spring inside the terminal block.
2. With a screwdriver inserted into the slot, insert a 5 to 6mm stripped wire or a wire crimped to the ferrule into the port completely. Insert one wire or ferrule into the port.
3. Remove the screwdriver.
4. To remove the wire, insert a screwdriver into the slot to open the spring, and pull out the wire.

When not using a crimp terminal, see below for stripping the wire.



Maximum sheath diameter is $\phi 3.7$ mm.

Conduit Entry on Both Ends

A maximum of four EF1As can be connected.
Do not connect more than four EF1As, otherwise the input current may exceed the limit.