



บริษัท เอดีดี เฟอร์เนส จำกัด

ADD FURNACE CO.,LTD.

44 ซอยบรมราชชนนี 70 ถนนบรมราชชนนี แขวงศาลาธรรมสพน์ เขตทวีวัฒนา กรุงเทพฯ 10170

โทร: 02-888-3472 โทร: ออกแบบ:08-08-170-170 แฟกซ์: 02-888-3258

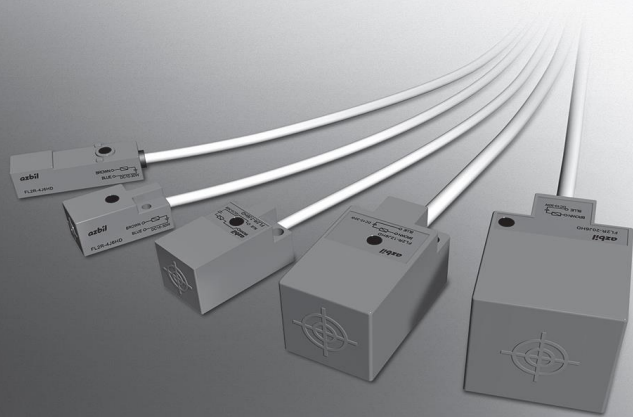
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DC3-wire Square Proximity Switches

Relays and Solenoids Can be Switched Directly.

FL2 Series

(maximum switching current: 200 mA)



Wide range of models available
(4, 7, 12, 20 mm, top/side, and N.O./N.C.)

Different-frequency types that are only slightly influenced by mutual interference available for all models

High seal capabilities (IP67)

Enhanced circuit protection
(surge absorption, load short-circuit, reverse connection)

Relays and solenoids can be switched directly
(maximum switching current: 200 mA)

ORDER GUIDE

●Standard (pre-leaded) model (cord length 1 m)

Actuation method	Appearance		Sensing distance	Sensing face	Output operation mode		Catalog listing
	Switch package style	Dimension			NPN	N.O.	
High-frequency Oscillating type (unshielded)		12x12x45	4 mm	Top	NPN	N.O.	FL2-4A6H
						N.C.	FL2-4B6H
					PNP	N.O.	FL2-4D6H
				N.C.		FL2-4E6H	
				Side	NPN	N.O.	FL2-4A6S
						N.C.	FL2-4B6S
		PNP	N.O.		FL2-4D6S		
			N.C.	FL2-4E6S			
		15x15x32	Top	NPN	N.O.	FL2-4A6QH	
					N.C.	FL2-4B6QH	
				PNP	N.O.	FL2-4D6QH	
			N.C.		FL2-4E6QH		
	Side		NPN	N.O.	FL2-4A6QS		
				N.C.	FL2-4B6QS		
		PNP	N.O.	FL2-4D6QS			
	N.C.		FL2-4E6QS				
	20x20x38	7 mm	Top	NPN	N.O.	FL2-7A6H	
					N.C.	FL2-7B6H	
				PNP	N.O.	FL2-7D6H	
			N.C.		FL2-7E6H		
Side			NPN	N.O.	FL2-7A6S		
				N.C.	FL2-7B6S		
		PNP	N.O.	FL2-7D6S			
N.C.			FL2-7E6S				
12mm		Top	NPN	N.O.	FL2-12A6H		
				N.C.	FL2-12B6H		
			Side	NPN	N.O.	FL2-12A6S	
		N.C.			FL2-12B6S		



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		40X40X53	20 mm	Top	NPN	N.O.	FL2-20A6H
						N.C.	FL2-20A6H
				Side	NPN	N.O.	FL2-20A6S
						N.C.	FL2-20B6S

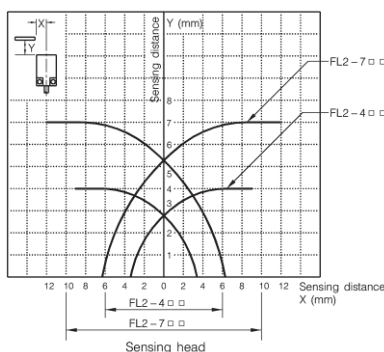
SPECIFICATIONS

Item	FL2-4□6□ FL2-4□6Q□	FL2-7□6□	FL2-12□6□	FL2-20□6□
Actuation method	High-frequency oscillating type (unshielded)			
Rated supply voltage	12/24Vdc			
Rated sensing distance	4±0.4mm	7±0.7mm	12±1.2mm	20±2mm
Usable setting distance	0 to 2.8mm	0 to 4.9mm	0 to 8.4mm	0 to 14mm
Standard target object	18×18mm, 1mm thick iron	25×25mm, 1mm thick iron	40×40mm, 1mm thick iron	50×50mm, 1mm thick iron
Differential travel	10% max. of sensing distance			
Operating voltage range	10 to 30Vdc			
Current consumption (leakage)	15mA max. (24Vdc)			
Output operation mode	A: NPN N.O., B: NPN N.C., D: PNP N.O., E: PNP N.C.			
Control output	Switching current: 200mA max., voltage drop: 1V max., output dielectric strength: 30Vdc			
Response frequency	200Hz	300Hz		50Hz
Temperature characteristics	±10% max. for the range of -25 to +70°C when +25°C is taken as standard temperature in sensing distance ±10% max. for the range of -25 to +50°C for FL2-4□6□/4□6Q□			
Supply voltage characteristics	±1% max. with ±20% voltage fluctuation with rated supply voltage as standard voltage in sensing distance			
Indicator lamps	Lights (red) when object approaches			
Operating temperature range	-25 to +70°C			
Storage temperature range	-25 to +70°C			
Operating humidity range	35 to 95%RH max.			
Insulation resistance	50MΩ min. (by 500Vac megger)			
Dielectric strength	500Vac, 50/60Hz for 1 minute			
Vibration resistance	10 to 55Hz, 1.5mm peak-to-peak amplitude, 2 hrs in X, Y and Z directions			
Shock resistance	490m/s ² 10 times in X, Y and Z directions			
Protection	IP67 (IEC standard)			
Weight (pre-leaded model)	Approx. 40g	Approx. 50g	Approx. 110g	Approx. 160g
Circuit protection	Surge absorption, load short-circuit protection, reverse connection protection			
Wiring method	Pre-leaded			
Case material	ABS resin			

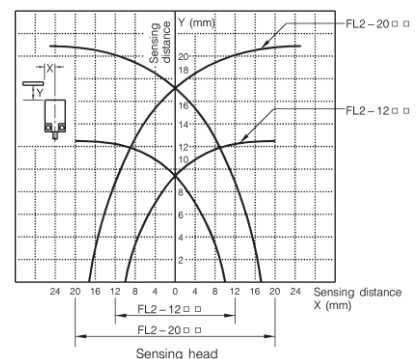
- Installation Instructions No.: CP-UM-3030E

SENSING AREA DIAGRAM (typical examples)

•FL2-12□□/FL2-20□□



•FL2-4□□/FL2-7□□





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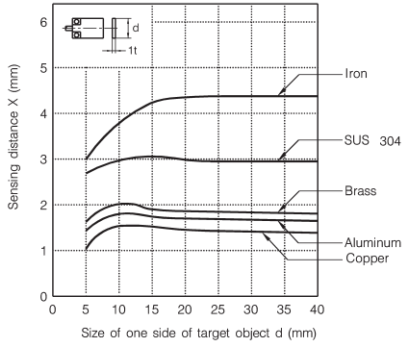
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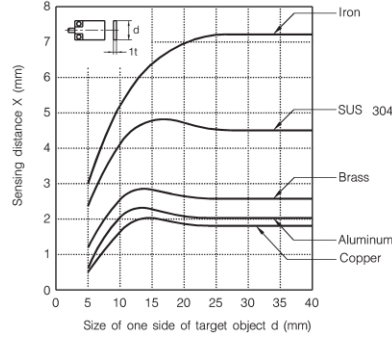
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SENSING DISTANCE ACCORDING TO MATERIAL & SIZE OF OBJECT (typical examples)

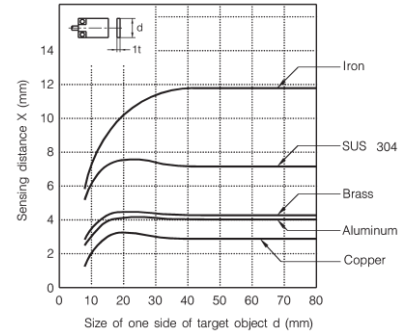
●FL2-4□□



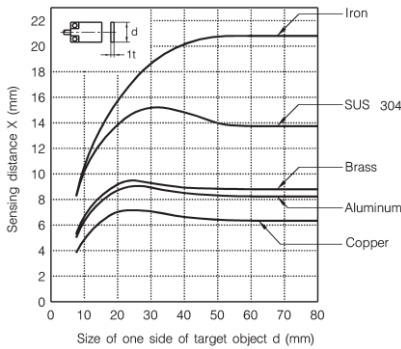
● FL2-7□□



● FL2-12□□



●FL2-20□□





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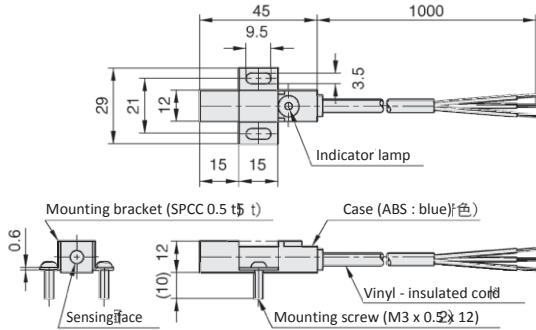
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EXTERNAL DIMENSIONS

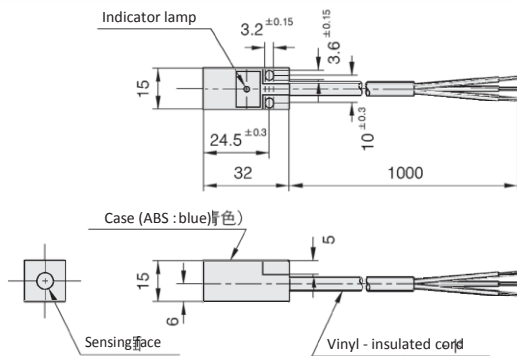
●Standard (pre-leaded) model

FL2-4□6H



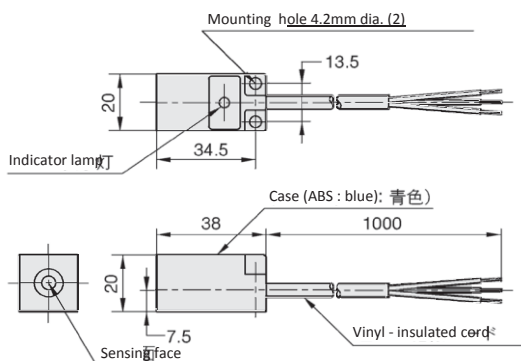
Note: A mounting bracket and two mounting screws and provided.
Vinyl-insulated cord (oil-resistant: 0.3mm², 27/0.12 dia., 3-core) 4.2mm dia.
The case color of different-frequency types “ -F ” is green.

FL2-4□6QH



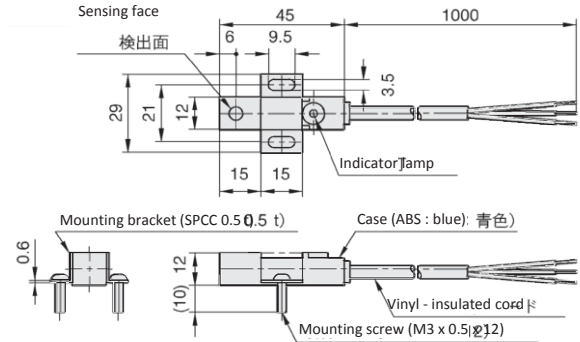
Note: Vinyl-insulated cord (oil-resistant: 0.3mm², 27/0.12 dia., 3-core) 4.2mm dia.
The case color of different-frequency types “ -F ” is green.

FL2-7□6H



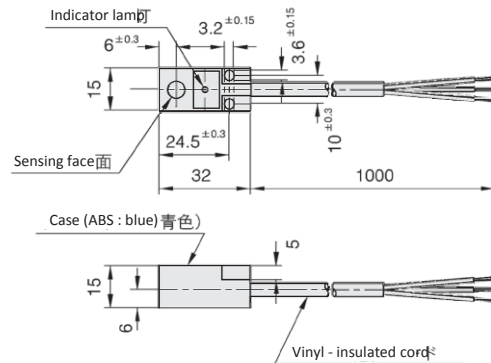
Note: Vinyl-insulated cord (oil-resistant: 0.3mm², 27/0.12 dia., 3-core) 4.2mm dia.
The case color of different-frequency types “ -F ” is green.

FL2-4□6S



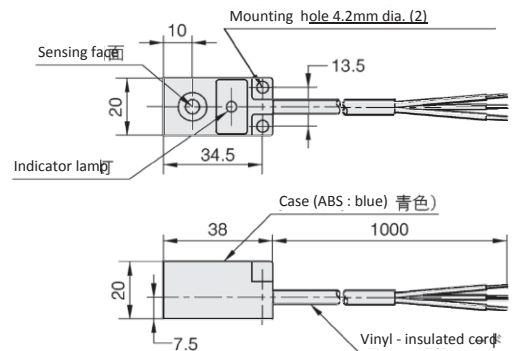
Note: A mounting bracket and two mounting screws and provided.
Vinyl-insulated cord (oil-resistant: 0.3mm², 27/0.12 dia., 3-core) 4.2mm dia.
The case color of different-frequency types “ -F ” is green.

FL2-4□6QS



Note: Vinyl-insulated cord (oil-resistant: 0.3mm², 27/0.12 dia., 3-core) 4.2mm dia.
The case color of different-frequency types “ -F ” is green.

FL2-7□6S



Note: Vinyl-insulated cord (oil-resistant: 0.3mm², 27/0.12 dia., 3-core) 4.2mm dia.
The case color of different-frequency types “ -F ” is green.



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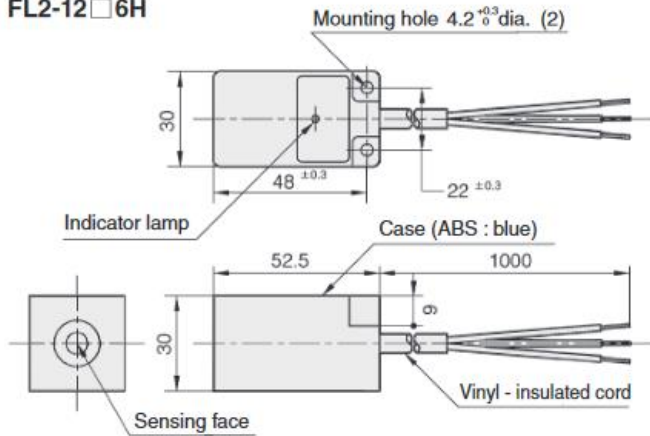
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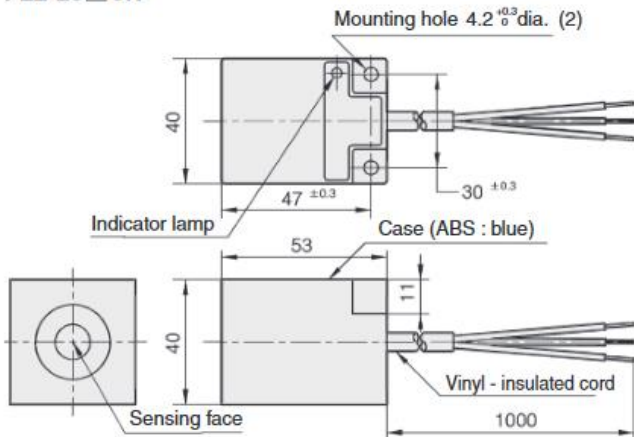
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FL2-12□6H



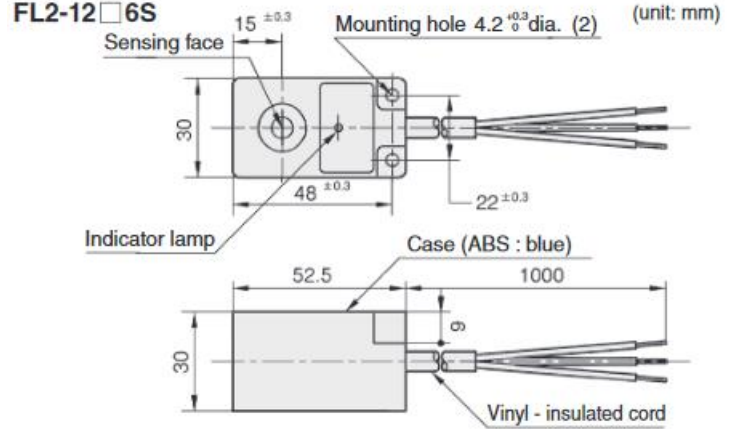
Note; Vinyl-insulated cord (oil-resistant: 0.3mm², 20/0.18 dia., 3-core) 5.7mm dia. The case color of different-frequency types “-F” is green

FL2-20□6H



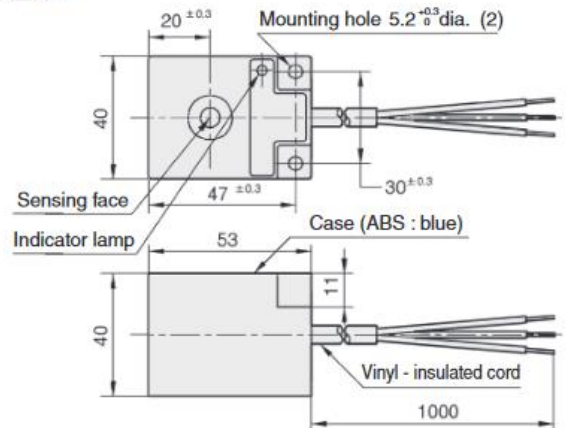
Note; Vinyl-insulated cord (oil-resistant: 0.5mm², 20/0.18 dia., 3-core) 5.7mm dia. The case color of different-frequency types “-F” is green.

FL2-12□6S



Note; Vinyl-insulated cord (oil-resistant: 0.3mm², 20/0.18 dia., 3-core) 5.7mm dia. The case color of different-frequency types “-F” is green.

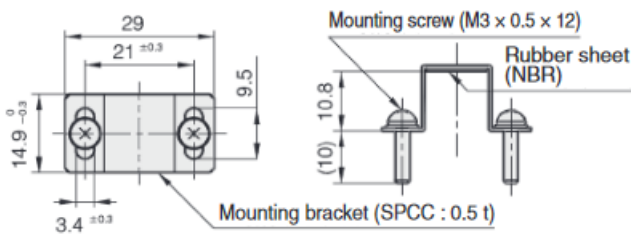
FL2-20□6S



Note; Vinyl-insulated cord (oil-resistant: 0.5mm², 20/0.18 dia., 3-core) 5.7mm dia. The case color of different-frequency types “-F” is green

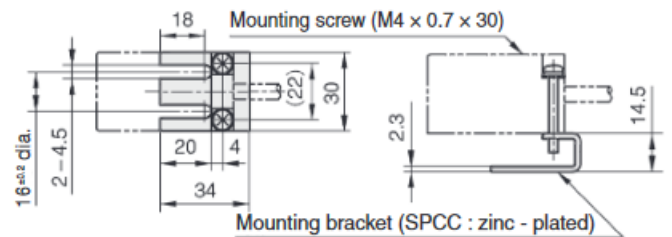
● **Mounting bracket (sold separately)**

FL2-PA5



Mounting brackets are made of iron. Two screws and two washers are provided for each bracket.

FL2-PA12



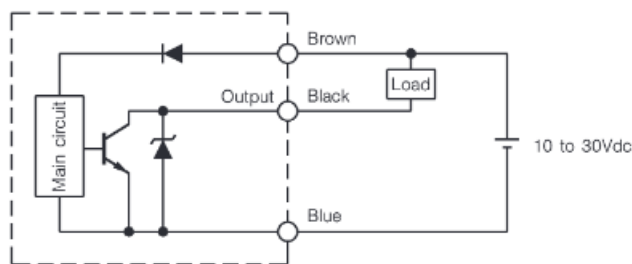
Catalog listing	Applicable models
FL2-PA5	FL2-4□6□
FL2-PA12	FL2-12□6□

Note: FL2-PA5 is provided with the proximity switch

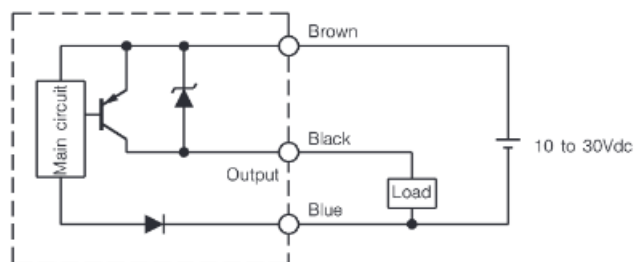


CIRCUIT AND WIRING DIAGRAMS

• DC NPN type



• DC PNP type



PRECAUTIONS

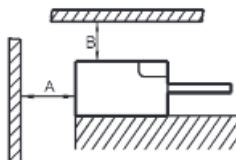
1. Mounting

Tighten the screws to the torque shown below

Catalog listing	Allowable tightening torque(N-m)	Recommended sacrew diameter
FL2-4□6□	0.5	Screw provided
FL2-4□6Q□	0.5	M3
FL2-7□□□	0.5	M4
FL2-12□□□	0.5	M4
FL2-20□□□	0.5	M5

2. Influence of surrounding metal

Metal other than the object surrounding the switch may influence operating characteristics. Maintain the following space between the switch and surrounding metal:



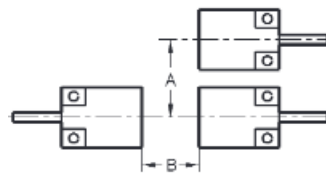
Note: Shaded areas indicate Surrounding metal other than the target object.

Catalog listing	A(mm)	B(mm)
FL2-4□6H	20	10
FL2-4□6QH		
FL2-4□6S		
FL2-4□6QS		
FL2-7□6H	30	15
FL2-7□6S	15	30
FL2-12□6H	50	25
FL2-12□6S	25	50
FL2-20□6H	80	40
FL2-20□6S	40	80

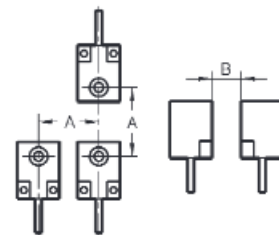
3. Mutual interference prevention

When mounting proximity switches in parallel or facing each other, mutual interference may cause the switch to malfunction. Maintain at least the spaces indicated in the figures above. When standard frequency types and different-frequency types "-F" are used alternately in a row ("()") for dimensions A and B in the label below.

Side sensing type



Front sensing type



Catalog listing	A(mm)	B(mm)
FL2-4□6□	30(15)	40(20)
FL2-4□6Q□		
FL2-7□6□	80(40)	80(40)
FL2-12□6□	120(60)	120(60)
FL2-20□6□	200(100)	200(100)

4. Operation upon power ON

After the power is turned ON, it takes 40ms or less until the Proximity switch is ready for sensing.

When the load and the proximity switch use different power Supplies, be sure to turn the proximity switch ON before turning the load ON.

5. Minimum cable bend radius (R)

The minimum bending radius (R) of the cord is 3 times cord diameter, take care not to excessively bend the cord within 30mm of the cord lead-in port.