

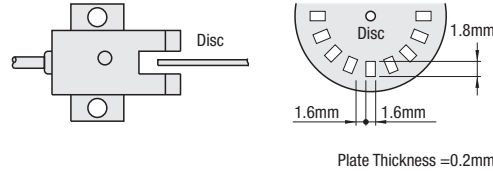
# Photomicrosensors

## Overview

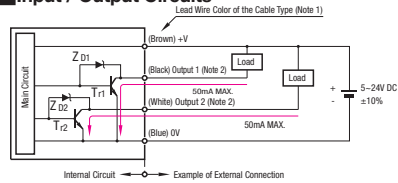
**Do not use this product as a detection device for human body protection.**  
(For human body protection, use products compliant with the local laws and regulations such as OSHA, ANSI and IEC.)

Type	Mini Type	Compact Type - Cable	Compact Type - Connector
Part Number	FPM□24	FPM□44	FPM□54
Detection Distance		5mm (Fixed)	
Smallest Detected Subject		0.8x1.8mm Opaque Objects	
Hysteresis		0.05mm or less	
Repeatability		0.03mm or less	
Power Supply Voltage		5 ~ 24V DC±10% Ripple P-P 10% or less	
Current Consumption		15mA or less	
Output		NPN Transistor - Open Collector • Max. Allowable Current: 50mA • Applied Voltage: 30V DC or less (between Output and 0V) • Residual Voltage: 0.7V or less (at 50mA applied) 0.4V or less (at 16mA applied)	
Response Time		Light Seen - ON / Light Blocked - ON Equipped 2 Outputs Light Seen: 20µs or less / Light Blocked 100µs or less (Frequency Response 1kHz or higher) (Note 1)	
Operation Status Indicator		RED LED (ON while light seen)	
Environmental Protection	Service Ambient Temperature (Note 2)	-25 ~ +55°C (No Condensations or Freezing), In Storage: -30 ~ +80°C	
	Service Environment Humidity	35 ~ 85%RH, In Storage: 35 ~ 85%RH	
	Service Environment luminosity	Fluorescent Light: 1,000lx or less at Lit Surface	
	Withstand Voltage	1,000VAC 1 min., between Circuit and Case	
	Dielectric Strength	50MΩ or higher at 250VDC, between Circuit and Case	
Vibration Resistance	Endurance 10 ~ 2,000Hz, Full Wave Amplitude 1.5mm X, Y, Z Directions for 2 hrs.		
Shock Resistance	Endurance 15,000m/s <sup>2</sup> (approx. 1,500G) X, Y, Z Directions for 3 times		
Light Emitting Element	Infrared LED (Unmodulated)		
Material	Case: PBT, Slit Cover: Polycarbonate, Terminal (FPM□54 only): Solder Plating		
Cable	0.09mm <sup>2</sup> - 4 Conductor Cabtyre Cable 1m		
Cable Extension	Extendable up to 100m when 0.3mm <sup>2</sup> or larger cable used.		
Mass	Approx. 10g	Approx. 15g	Approx. 3g
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(Note 1): Frequency Response is the value from rotating disc on the right.  
(Note 2): Ensure to mount Mini Type to metals when using under the temperature +50°C or more.



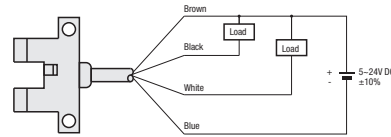
### Input / Output Circuits



(Note 1): Lead wire colors of connector type are the same.  
(Note 2): Ensure to insulate unused output wires.

Codes ... Z01, Z02: Zener Diodes for Surge Protection  
Tr1, Tr2: NPN Output Transistors

### Connections



### Output Operation

Output	Lead Wire Color	Output Operation
Output 1	Black	Light Seen - ON
Output 2	White	Light Blocked - ON

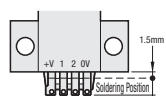
### Cautions

- Wiring**
  - Proper wiring is needed since power supply reverse polarity circuit protection or output short circuit protection are not provided. Also ensure to insulate unused output wires.

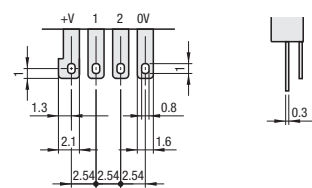
### Soldering

- When soldering on terminals directly, ensure to meet the following conditions.

	FPM□54
Soldering Temperature	260°C or less
Soldering Time	3 sec. or less
Soldering Position	See the diagram on the right.

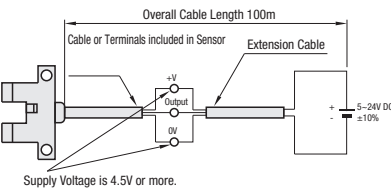


### Terminals



### Cable Extension

- Although cables 0.3mm<sup>2</sup> or more can be extended up to 100m long, extended cables will cause voltage drop. Ensure to maintain a proper rated voltage at the wire terminations or terminal blocks.



However, when the overall cable length including accessory cables is as described below, voltage checking would be unnecessary.

Conductor Sectional Area	Overall Cable Length
0.08~0.1mm <sup>2</sup>	Up to 5m
0.2mm <sup>2</sup>	Up to 10m
0.3mm <sup>2</sup>	Up to 20m

### Tightening Torque

Part Number	Tightening Torque
FPM□24	0.15N·m
FPM□44	0.5N·m
FPM□54	0.5N·m

### Others

- Since this is a product for embedded use, external light interference resistant feature is not provided. Do not expose the receiving section to direct lights.



- Avoid usage during power-on transient state (50ms).

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## Mini Type

✗ Not available outside of Japan.

Rails for Mounting P2077~2083 Slit Cams for Indexing P2075

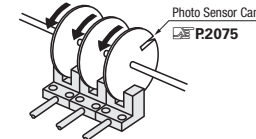
FPMK24 (Standard)	FPMF24 (Type F)	FPMU24 (Type U)	FPML24 (Type L)	FPMR24 (Type R)

Shape	Part Number	Detection Distance	Output	Operation Mode	Unit Price
Standard	FPMK24	5mm (Fixed)	NPN Transistor Open Collector	Light Seen - ON Light Blocked - ON Equipped 2 Outputs	
Type L	FPML24				
Type F	FPMF24				
Type R	FPMR24				
Type U	FPMU24				

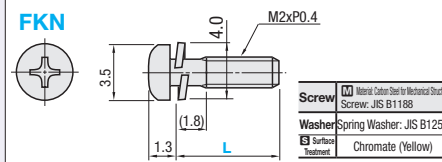
Ordering Example: Part Number FPML24



The slit on a rotating disc detects the home position.



### Screws for Photo Sensors (M2)



Part Number	Unit Price	Volume Discount Rate
Type M-L	1 - 5 pcs	6 - 1000
FKN	2-6	
	2-8	
	2-10	
	2-12	

Ordering Example: Part Number FKN2-8

For orders larger than indicated quantity, please check with WOS.