

OUTLINE

This is an embedded amplifier photo sensor with fluoroplastic (PFA) covering for enhanced resistance to oils and chemicals. The Through beam and Diffuse reflection types are prepared. Optional potentiometer unit for sensitivity adjustment is available.

SPECIFICATIONS

MODEL	PF-T3RDS	PF-T3DS	PF-T3S	PF-R03RS	PF-R03DS	PF-R03S
DETECTION METHOD	Through beam			Diffuse reflective		
DETECTING DISTANCE	3m			300mm(100×100mm white drawing paper)		
DETECTION OBJECT	dia.20mm (Min.) Opaque			Opaque, translucent and transparent		
POWER SUPPLY	12 to 24VDC ±10% Ripple 10% or less					
CURRENT CONSUMPTION	Transmitter : 12mA or less			20mA or less		
	Receiver : 15mA or less					
OPERATION MODE	Dark ON	Dark ON	Light ON	Light ON	Dark ON	Light ON
OUTPUT MODE	NPN open collector output Sink current 100mA, 30VDC or less					
RESPONSE TIME	0.35ms or less					
HYSTERESIS	—			10% or less		
OPERATING ANGLE	10° (at receiver)					
LIGHT SOURCE (LIGHT WAVELENGTH)	Red LED (700nm)	Infrared LED (880nm)		Red LED (700nm)	Infrared LED (880nm)	
	Transmitter : power indicator (Red LED)			Operation indicator (Red LED)		
INDICATOR	Receiver : operation indicator (Red LED)			Stability indicator (Green LED)		
	Stability indicator (Green LED)			Stability indicator (Green LED)		
VOLUME	Not provided (optional : sensitivity adjustable with external volume)					
SHORT CIRCUIT PROTECTION	Provided					
MATERIAL	Case : PFA (fluoroplastic)					
CONNECTION	Attached cable 3m (outer dimension : dia. 5mm) (2m protected with PFA tube)					
	Transmitter. 0.15mm ² 2 cores			Receiver. 0.15mm ² 4 cores		
WEIGHT	Approx. 100g (transmitter/receiver)			Approx. 100g		
ACCESSORY	Operation manual					

CHEMICAL RESISTANCE OF PFA (FLUORINE RESIN)

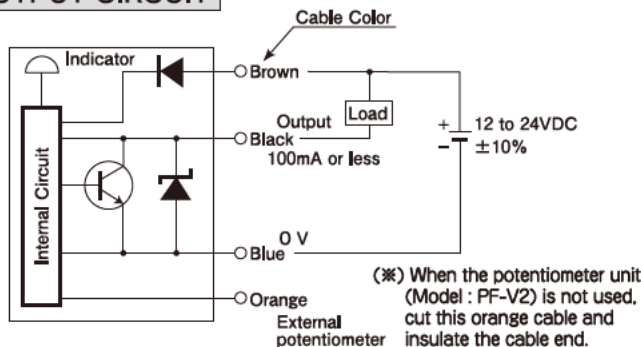
○ : Applicable
× : Inapplicable

SUBSTANCE	PFA	SUBSTANCE	PFA
A.B.C. Crude Petroleum	○	Chloroform	○
Aniline	○	Light oil (Gas oil)	○
Acrylonitrile	○	Mineral oil	○
Asphalt	○	Ethylene Trichloride	○
Acetone	○	Soda Dichromate	○
Alcohol	○	Barium Nitrate	○
Ammonia	○	Silicon oil	○
Isooctane	○	Vegetable oil	○
2-Methy-1-Propanol	○	Thinner	○
Iso Butyl Methyl Ketone	○	Mathanol	○
Ethanol	○	Methyl Violet	○
Ether	○	Barium Hydroxide	○
Ethylene Glycol	○	Phenol	○
Enamel Paint	○	Turbine oil	○
Ammonium Chloride	○	Soda Carbonate	○
Calcium Chloride	○	Turpentine oil	○
Sodium Chloride	○	Natural Volatile Oils	○
Barium Chloride	○	Kerosene	○
Chlorine	○	Trichloroethane	○
Ammonium Sulfate	○	Trichloroethylene	○
Carbon Tetrachloride	○	Toluene	○
Gasoline	○	Naphtha	○
Glass material	○	Lactic Acid	○
Dilute Hydrochloric Acid	○	Nitrobenzene	○
Dilute Caustic Soda	○	Fluorine	×
Dilute Acetic Acid	○	Ferrosilicon	○
Dilute Nitric Acid	○	Freon 11	○
Dilute Sulfate Acid	○	Propanol	○
Citric Acid	○	Propylene Alcohol	○
Glycerin(e)	○	Benzene	○
Cresol	○	Water	○

AMBIENT CONDITIONS

AMBIENT LIGHT	5,000 lx or less
AMBIENT TEMPERATURE	-25 to +55°C (non-freezing/non-condensing)
PROTECTION	IP67 oilproof (Sensor body and cable up to 2m from body)
VIBRATION	10 to 55Hz, 1.5mm Double Amplitude 2Hr., 3 Directions
SHOCK	500m/s ² 3 times, 3 Directions
INSULATION RESISTANCE	500VDC, 20MΩ or higher
DIELECTRIC WITHSTANDING	1000VAC for 1 minute

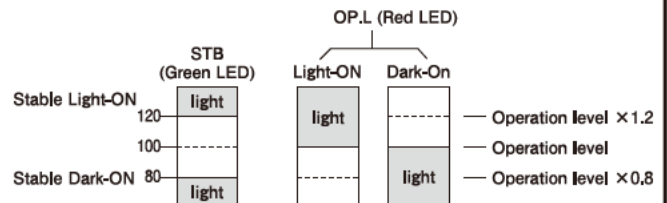
OUTPUT CIRCUIT



- Load short circuit or overload shuts off the output transistor.
- To reset the output, turn the power back on after checking the loaded condition.

INDICATOR

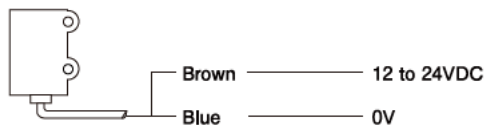
- Operating indicator : Red LED, Stability indicator : Green LED
- Confirm to get stable light capacity by repeating of Light-on and Dark-on after adjustment of light axis and sensitivity.



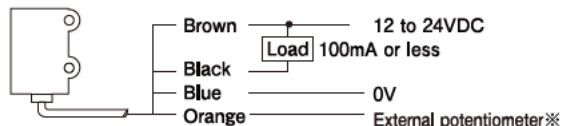
- Red LED of receiver means the operating indicator.
Light-ON : Indicator lights at receiving light.
Dark-ON : Indicator lights at blocking light.

WIRING

Transmitter of throughbeam type



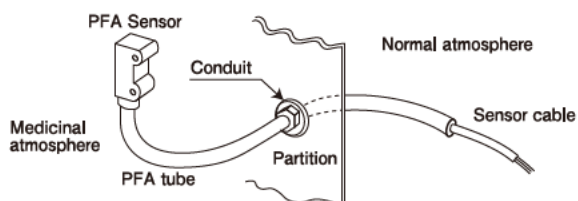
Receiver of throughbeam type and Diffuse reflection type



(※) When the potentiometer unit (Model : PF-V2) is not used, cut this orange cable and insulate the cable end.

HOW TO INSTALL

- The housing of the sensor and fiber cable are covered by PFA (the fluorine resin). The cable of vinyl chloride appears from the PFA tube (it's 2m length from the sensor head). The PFA tube and cable are not structured with airtight condition. In case of using this sensor at the chemical atmosphere, utilize the conduit for PFA tube on the partition installed between there and the normal atmosphere.



- In case of using this sensor in the chemical tank, it is possible to give internal pressure (0.01~0.02Mpa approx.) from the end of PFA tube.

NOTES

- PFA (the fluorine resin) has a strong chemical durability, but can not be resistant to the fluorine and strong acids. The durability of the PFA tube depends on the temperature of the chemicals or oils to be exposed or use environment. Earlier replacement is recommended when the sensor is used with highly corrosive or erosive chemicals.
- The bending and stretching intensity between the sensor and the tube is 0.5N·m or less.
- In case of using this sensor under water, the depth of water is within 500mm. Make sure of CHEMICAL RESISTANCE OF PFA of this manual.
- Don't use in the hazardous area where an explosion proof equipments are required.
- Use M4 screws for fixing the sensor. Tightening torque is within 0.6N·m. in case of using the stainless screw. Use PFA screws for higher chemical durability.
- Be sure to route the sensor wires separate from any power transmission or high voltage line. Use a same conduit or duct with high-voltage or power lines will cause malfunction or damage by induction.
- High frequency fluorescent lamps or inverters may emit light or noise of similar modulated frequency that photo sensors generate. Do not install the sensor in the vicinity of high-frequency equipment.
- When expanding the wiring, use cables with 0.3mm² or more. Don't expand the wire between the sensor and the external volume unit.
- Limit the current of the power supply (2A) in accordance with the size of the sensor cable.
- When using a DC power unit with an insulated transformer or a switching regulator, be sure to ground the frame ground (FG) terminal.

EXTERNAL POTENTIOMETER FOR SENSITIVITY ADJUSTMENT

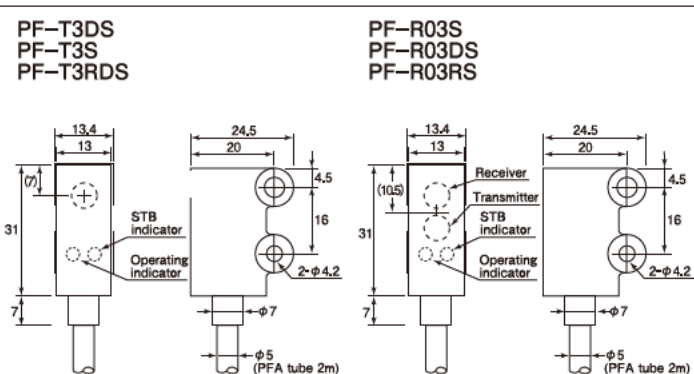
Model	: PF-V2(NPN output) PF-V2PN(PNP output)
Power supply	: 12 to 24VDC ±10% Ripple 10% or less
Output mode	: Open collector output
Rating	: 100mA (30VDC) or less
Response time	: 0.3ms or less
Short circuit protection	: Built-in
Wiring	: Flying lead 2m length
Sensor side	: 0.2mm ² ×4C φ4 Power supply side 0.2mm ² ×3C φ4
Case material	: Polycarbonate
Weight	: Approx. 150 g

It is connected to the receiver of throughbeam type and the diffuse reflection sensor.

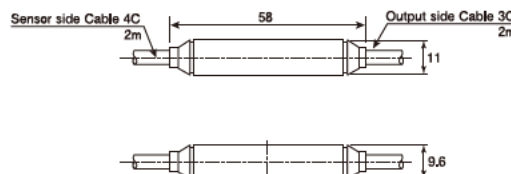


(※) Use this external potentiometer at the normal atmosphere because it is not protected by PFA (the fluorine resin).

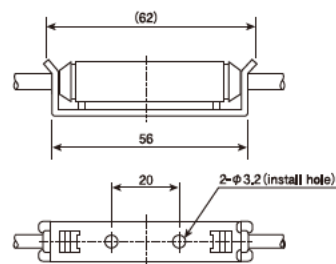
DIMENSIONS (unit : mm)



PF-V2 Volume Unit (Option)



HZ-01



- This sensor is designed to detect a specific object. It is not provided with control functions for prevention of injuries or accidents in itself.
- Takex will not held responsible for any damage or loss incurred due to accidents, faulty installation, abuse, misuse, improper maintenance or acts of God including lightning surge.
- Specifications and dimensions may be subject to change without notice.