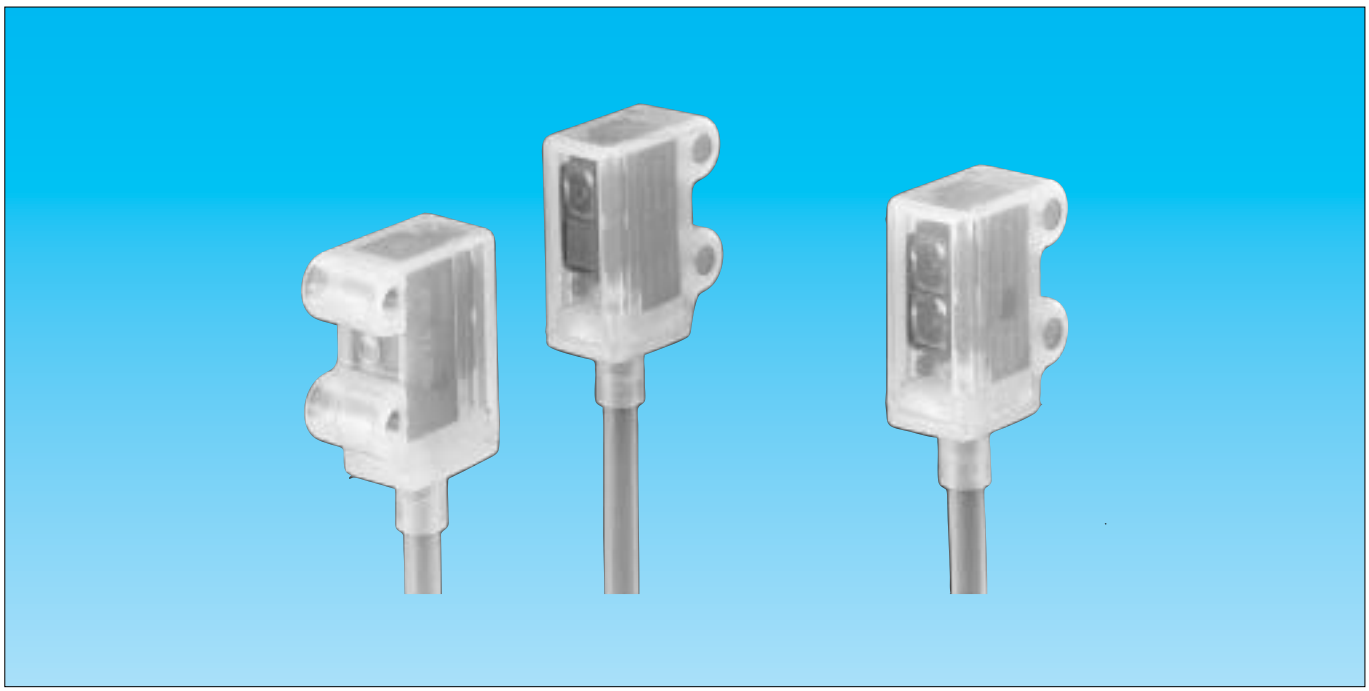
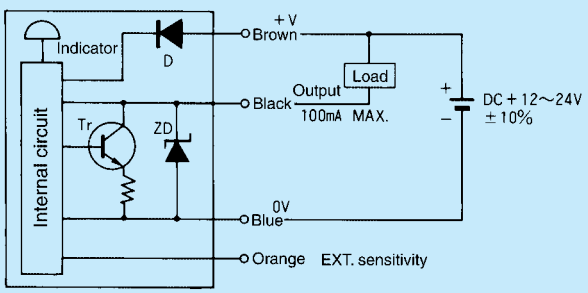
PF series

DC POWER SUPPLY
PHOTO SENSORS

- The sensor body and the cable are packed inside an external case and a sleeve made of fluorine resin (PFA), and therefore the sensor is resistant to oil and chemicals.
- The unit is very resistant to oil and chemicals. It can be used even in liquid.
- It has the amplifier built in.
- Long distance detection is possible.
  (Transparent type 3m, diffuse reflective type 30cm)
- Fast response 0.35ms.
- Optional External Sensitivity adjustment type is available.

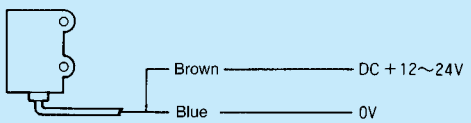


■ OUTPUT CIRCUIT

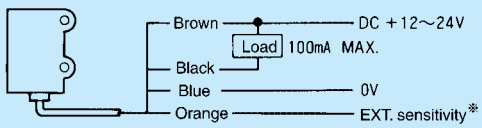


Loaded short circuit or overload shuts off the output transistor.
Turn the power back on after checking the loaded condition.

Transmitter



Receiver



※Cut this lead back when not using the adjustment unit (model : PF-V2), so that it will not short circuit any of the other cables.

■ SPECIFICATIONS

MODEL	PF-T3DS	PF-R03S
DETECTION	Through beam	Diffuse reflection
RANGE(Max.)	3m	30cm
POWER SUPPLY	12－24VDC ±10% Ripple 10%(Max.)	
CURRENT CONSUMPTION	Trns.：12mA(Max.) Rcvr.：15mA(Max.)	20mA(Max.)
MODE OPERATING	Dark-on	Light-on
OUTPUT MODE RATING	Open collector NPN output Sink current 100mA, 30VDC(Max.)	
RESPONSE TIME	0.35msec(Max.)	
HYSTERESIS	—	10%(Max.)
BEAM DEVIATION	10° (Receiver)	—
LIGHT SOURCE	Infrared LED(880nm)	
INDICATOR	Trns.：Power(Red LED) Rcvr.：Operaion(Red LED) Stability(Green LED)	Operation(Red LED) Stability(Green LED)
SENSITIVITY ADJUSTMENT	Nil(Option：Available External Sensitivity Adjustment Unit)	
SHORT CIRCUIT PROTECTION	Built-in	
CASE MATERIAL	PFA(Fluorine resin)	
CONNECTION	Flying lead 3m length(2m is protected by PFA tube)	
	Trns.：0.15sq×2C Rcvr.：0.15sq×4C	0.15sq×4C
WEIGHT(Max.)	Trns. & Rcvr.：100g	100g

■ ENVIRONMENT

Ambient light	Withstands 5,000 lx(Max.)
Operating temp.	－25～＋55℃
Case protection	IP67G(Within 1m length from sensor's body.)
Vibration	10 to 55Hz, 1.5mm Amplitude 2Hr., 3 Directions
Shock	500m/s, 3 times, 3 Directions
Insulation resistance	500VDC, 100MΩ Max.
Dilectric withstanding	AC1000V, 1 minute

■ Remote potentiometer for Sensitivity adjustment and light-on/dark-on selection.

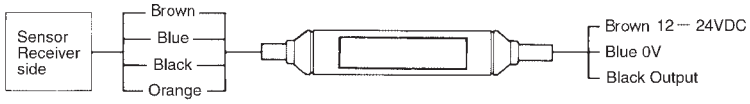
This is a repeater unit that has a changeover switch for the operation mode, the sensitivity adjustment and the operation indicator. This is very useful for remote adjustment.

Specifications

Model : PF-V2 (NPN output)
PF-V2PN (PNP output)
Operation power : 12－24VDC±10%
Ripple 10% maximum
Output mode : Open collector output
100mA (DC30V) MAX
Response time : 0.3ms max.
Short protection : Included
Connection : Flying lead (2m each)
Sensor side 0.2sq x 4 cores
External diameter 4mm
Power, output side 0.2sq x 3 cores
External diameter 4mm
Case material : Polycarbonate
Weight : 150g Max.

Connection

It is connected to the receiver of the through beam type sensor and the cable of the reflection type sensor.



Note: The adjustment unit and the cable are not covered in PFA (Fluorine resin)

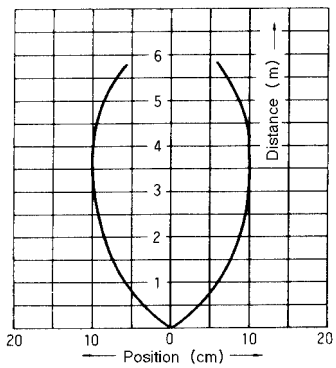
■ CHEMICAL DURABILITY

○ : Possible to use　　× : Impossible to use

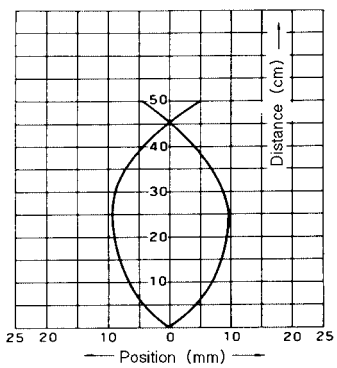
SUBSTANCE	PFA	SUBSTANCE	PFA
A.B.C. Crude Petroleum	○	Chloroform	○
Aniline	○	Light oil（Gas oil）	○
Acrylonitrile	○	Mineral oil	○
Asphalt	○	Ethylene Trichoride	○
Acetone	○	Soda Dichromate	○
Alcohol	○	Barium Nitrate	○
Ammonia	○	Silicon oil	○
Isooctane	○	Vegetable oil	○
2-Methy-1-Propanol	○	Thinner	○
Iso Butyl Methyl Ketone	○	Methanol	○
Ethanol	○	Methyl Violet	○
Ether	○	Barium Hydroxide	○
Ethylene Glycol	○	Phenol	○
Enamel Paint	○	Turbine oil	○
Ammonium Chloride	○	Soda Carbonate	○
Calsium 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	○

■ ACTIVE BEAM WIDTH

PF-T3DS

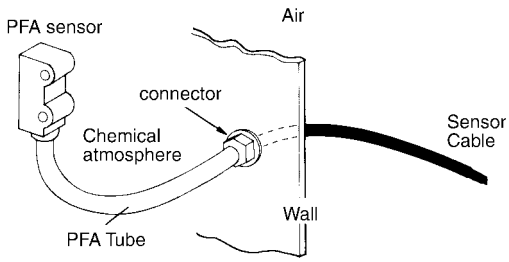


PF-R03S



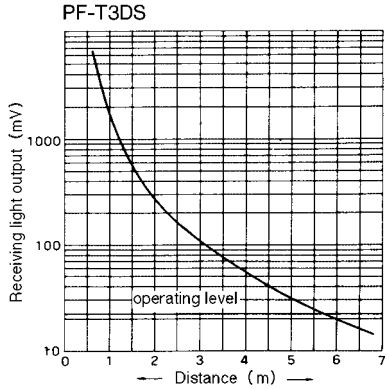
■ HANDLING (EXAMPLE)

The sensor itself and the part of the cable are made of PFA (Fluorine resin). A Polyvinyl chloride cable feeds out from the PFA sleeve (2m from the sensor). When using the unit in a harsh chemical environment, use a gland between the PFA sleeve and the bulkhead, because the joint between the PFA sleeve and the cable is not sealed.

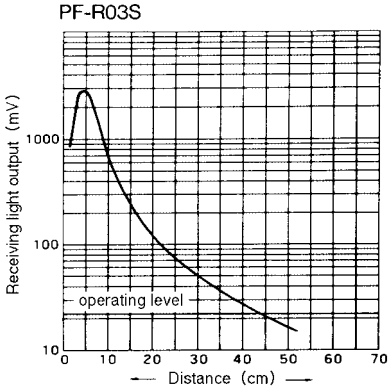


■ DISTANCE VS RECEIVING LIGHT OUTPUT CHARACTERISTICS

PF-T3DS

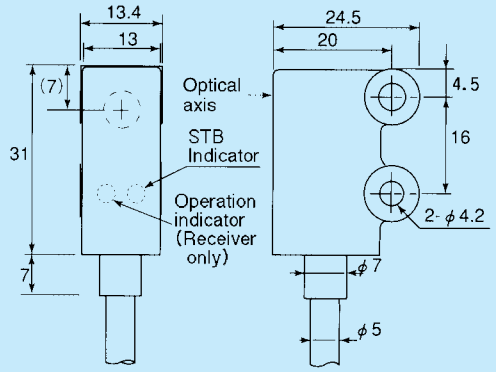


PF-R03S

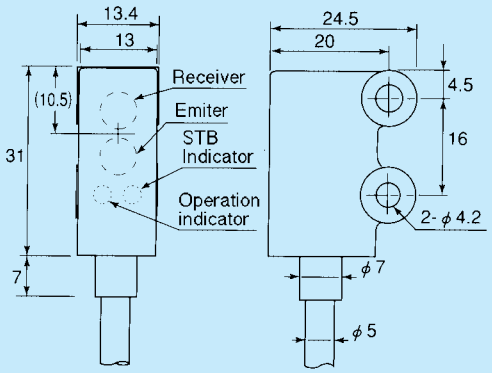


■ DIMENSIONS

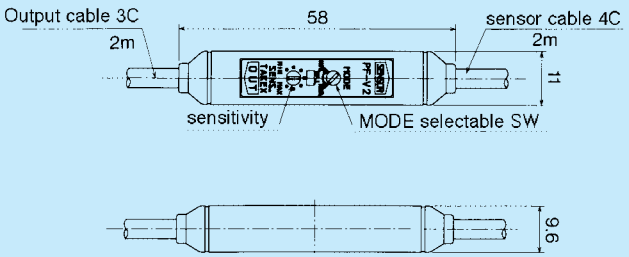
PF-T3DS



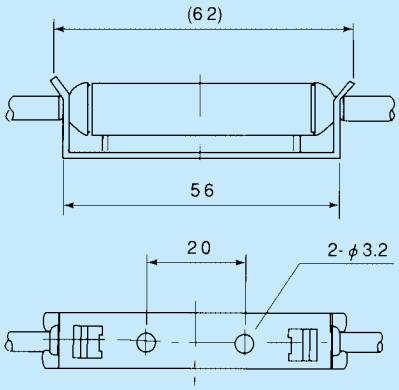
PF-R03S



PF-V2 sensitivity unit



with Bracket HZ-01



■ CORRECT USE

- Do not bend the PFA sleeve 30 R or less.
- Do not expose the sensor body or the sleeve to a pulling or bending force of the 0.5N・m（approx. 5kg・f・cm）.
- This product can be submerged in water to a maximum depth of 50 cm. Refer to the chemical tolerance chart when using in a chemical liquid.
- The unit can not be used in a dangerous place where explosion-protection performance is required.
- When extending the cable, use a cable whose diameter is bigger than 0.3sq.
  Avoid extending the distance between the sensor and the remote adjustment unit.
- Use M4 screws to install the sensor. When using a stainless screw maximum tightening torque 0.6N・m max. To improve the tolerance performance against chemicals, use fluorine resin（PFA）screws.
- Although the PFA（Fluorine resin）is resistant to chemicals, avoid exposure to fluorine or strong acid chemicals. The tolerance of the unit depends upon permeability, corrosion or temperature of the chemical and the usage condition of the sensor.

・The electrical operation warranty of the product is 1 year.
・Tolerance to chemicals regarding its appearance （PFA）is excluded because its durability cannot be specified.