FM-FP

Product Features:

Response Time Less than 3.33mS.

Adjustable sensitivity.

Output with over-current protection.

LIGHT-ON,DARK-ON selectable.

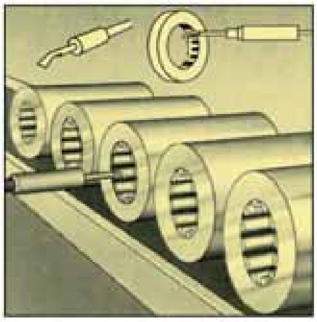
Long Detection Range.

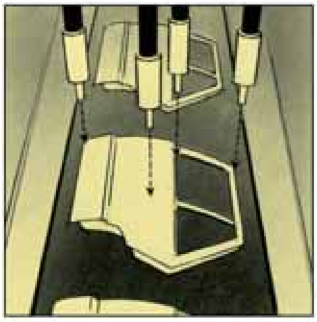
Built-in switching amplifier.

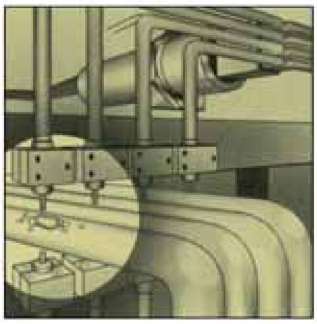
the new generation of photo-electronic sensors Ø 18 mm, finally the best quality at low cost

CE

ESEMPIO DI IDENTIFICAZIONE DELLA SIGLA DI ORDINAZIONE



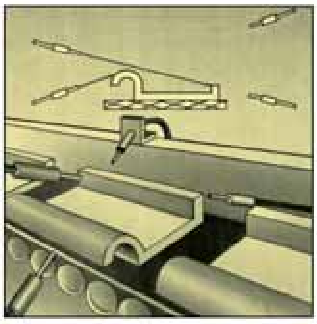




TIPI A RIFLESSIONE DIRETTA

F P R 18 - 400 - SON - K

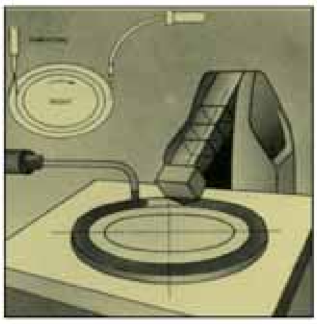
- F: Sensore fotoelettrico
- P: Custodia in Plastica ABS = P, Ottone nichelato = M
- R: Potenziometro regolabile
- 18: Diametro custodia (mm)
- 400: Campo di intervento (mm) su carta bianca Kodak 200x200 mm (distanza max 800 mm)
- SON: Funzioni uscita NO (NC) / NPN = SON, NO (NC) / PNP = SOP
- K: Connessione
  - K = 2m cavo diritto 4 fili PVC
  - S = connettore M12
  - Z = 2m cavo angolato 90° 4 fili PVC



TIPI PER CATARIFRANGENTE

F P R 18 - RR - SON - K

- RR: Versione per funzionamento tramite catarifrangente:
  - TIPO M46: campo d'intervento 2m
  - TIPO M51: campo d'intervento 4m



TIPI A BARRIERA (EMETTITORE + RICEVITORE)

F P R - 18 - 8 - SE - SON - K

- 8: Campo d'intervento fra emettitore e ricevitore: 8.000mm
- SE: Versione a barriera

TIPI A FIBRA OTTICA

F P R 18 - FO - SON - K

- FO: Versione per connessione a fibra ottica: vedere pagine per fibre ottiche FR+FT

EXAMPLE OF IDENTIFICATION OF THE ORDER NUMBER

DIFFUSE REFLECTIVE TYPES

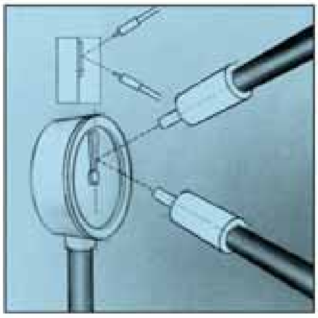
F P R 18 - 400 - SON - K

Photoelectronic sensor — F

ABS Plastic case = P
Ni Plated brass case = M

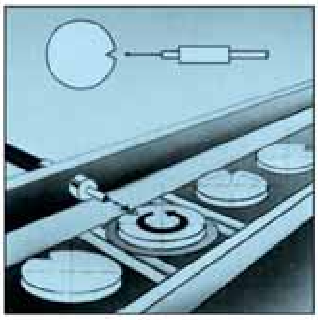
Adjustable potentiometer — R

Case diameter (mm) — 18

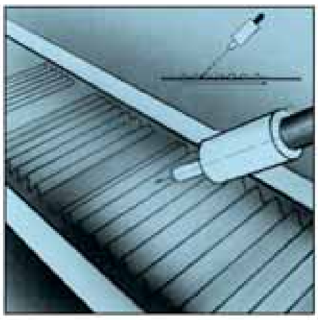


Detection range (mm)
on 200x200 mm Kodak white paper
(max distance 800 mm) — 400

Output function
NO (NC) / NPN = SON
NO (NC) / PNP = SOP



Connection
K = 2m PVC 4 wires Right cable
S = M12 plug
Z = 2m PVC 90° angle cable 4 wires



RETRO REFLECTIVE TYPES

F P R 18 - RR - SON - K

Version for detection
through reflector mirror:
Type M46: detection range 2m
Type M51: detection range 4m

THRU BEAM (EMITTER+RECEIVER) TYPES

F P R - 18 - 8 - SE - SON - K

Detection range
between emitter and receiver:
8.000mm

Emitter+receiver version — SE

FIBER OPTIC TYPES

F P R 18 - FO - SON - K

Version for connection
to fiber optic: see pages
for Fiber Optic FR+FT

Advantages:
1. *High performance with low cost*
2. *Quick delivery*
3. *Easy to use*
4. *Variety selection*
5. *International standard*

Available types	FPR18-400-SON-K FPR18-400-SON-Z FPR18-400-SON-S FPR18-400-SOP-K FPR18-400-SOP-Z FPR18-400-SOP-S
Detection range	400mm(800mm), 20x20cm Kodak white card
Supply Voltage	DC10-30V ±20%, ripple(P--P):10% Max
Current Consumption	30 mA Max
Max Output Current	100 mA Max
Response Time; Switching Frequency	Less than 3.0 mS(ON+OFF):333 Hz
Circuit Protection	1. Output Over Current Protection
	2. Reverse-Polarity protected
	3. Interference suppression
Output Type	NPN or PNP open collector
Operation Mode	LIGHT-ON, DARK-ON selectable by control cable(White)
Light-on Operation (NO-Function)	Control cable (White wire) connected to 0V (Blue) ○
Dark-on Operation (NC-Function)	Control cable (White wire) connected to +V (Brown) ○
Indicator	Yellow LED on, when Light is received
Ambient Temperature:	Operating Temperature: -25°~55°C
Protection Degree	IP 66
Extraneous Light Immunity	Lamplight:3000Lux; Sunlight:10000Lux Max
Housing Material: Plastic Housing	Housing and Nut: ABS resin, Color: Green, Lens: PMMA
Adjustable Sensitivity:	YES--By Potentiometer
Cable	Length: 2m, Material: PVC, Color: Gray
Weight:	K:89g, Z:69g, S:21g

○ For PNP output. In case of NPN output, the connections must be inverted.

DIFFUSE TYPES with metal case

Technical Data

Advantages:

1. *High performance with low cost*
2. *Quick delivery*
3. *Easy to use*
4. *Variety selection*
5. *International standard*

Available types	FMR18-400-SON-K FMR18-400-SON-Z FMR18-400-SON-S FPR18-400-SOP-K FMR18-400-SOP-Z FMR18-400-SOP-S
Detection range	400mm(800mm), 20x20cm Kodak white card
Supply Voltage	DC10-30V ± 20%, ripple(P--P):10% Max
Current Consumption	30 mA Max
Max Output Current	100 mA Max
Response Time; Switching Frequency	Less than 3.0 mS(ON+OFF);333 Hz
Circuit Protection	1. Output Over Current Protection
	2. Reverse-Polarity protected
	3. Interference suppression
Output Type	NPN or PNP open collector
Operation Mode	LIGHT-ON, DARK-ON selectable by control cable(White)
Light-on Operation(NO-Function)	Control cable (White wire) connected to 0V (Blue) ○
Dark-on Operation(NC-Function)	Control cable (White wire) connected to V+ (Brown) ○
Indicator	Yellow LED on, when Light is received
Ambient Temperature:	Operating Temperature:-25°~55°C
Protection Degree	IP 66
Extraneous Light Immunity	Lamplight:3000Lux;Sunlight:10000Lux Max
Housing Material:Metal Housing	Housing and Nut:BRASS, NI Plated, Lens:PMMA
Adjustable Sensitivity:	YES--By Potentiometer
Cable	Length:2m, Material:PVC, Color:Gray
Weight:	K:116g, Z:96g, S:48g

○ For PNP output. In case of NPN output, the connections must be inverted.

RETRO REFLECTIVE TYPES with plastic case

Advantages:
1. *High performance with low cost*
2. *Quick delivery*
3. *Easy to use*
4. *Variety selection*
5. *International standard*

Available types	FPR18-RR-SON-K FPR18-RR-SON-Z FPR18-RR-SON-S FPR18-RR-SOP-K FPR18-RR-SOP-Z FPR18-RR-SOP-S
Detection range	2M (M46 Mirror), 4M(M51 Mirro)
Supply Voltage	DC10-30V ± 20％, ripple(P--P):10％Max
Current Consumption	30 mA Max
Max Output Current	100 mA Max
Response Time; Switching Frequency	Less than 3.0 mS(ON+OFF);333 Hz
Circuit Protection	1. Output Over Current Protection
	2. Reverse-Polarity protected
	3. Interference suppression
Output Type	NPN or PNP open collector
Operation Mode	LIGHT-ON, DARK-ON selectable by control cable(White)
Light-on Operation(NO-Function)	Control cable (White wire) connected to 0V (Blue) ○
Dark-on Operation(NC-Function)	Control cable (White wire) connected to V+ (Brown) ○
Indicator	Yellow LED on, when Light is received
Ambient Temperature:	Operating Temperature:-25°~55°C
Protection Degree	IP 66
Extraneous Light Immunity	Lamplight:3000Lux;Sunlight:10000Lux Max
Housing Material:Plastic Housing	Housing and Nut:ABS resin, Color:Green, Lens:PMMA
Adjustable Sensitivity:	YES--By Potentiometer
Cable	Length:2m, Material:PVC, Color:Gray
Weight:	K:89g, Z:69g, S:21g, M46:11g, M51:20g

○ For PNP output. In case of NPN output, the connections must be inverted.

Available types	FMR18-RR-SON-K FMR18-RR-SON-Z FMR18-RR-SON-S FMR18-RR-SOP-K FMR18-RR-SOP-Z FMR18-RR-SOP-S
Detection range	2M (M46 Mirror), 4M(M51 Mirror)
Supply Voltage	DC10-30V ± 20％, ripple(P--P):10％Max
Current Consumption	30 mA Max
Max Output Current	100 mA Max
Response Time; Switching Frequency	Less than 3.0 mS(ON+OFF);333 Hz
Circuit Protection	1. Output Over Current Protection
	2. Reverse-Polarity protected
	3. Interference suppression
Output Type	NPN or PNP open collector
Operation Mode	LIGHT-ON, DARK-ON selectable by control cable(White)
Light-on Operation(NO-Function)	Control cable (White wire) connected to 0V (Blue) O
Dark-on Operation(NC-Function)	Control cable (White wire) connected to V+ (Brown) O
Indicator	Yellow LED on, when Light is received
Ambient Temperature:	Operating Temperature:-25°~55°C
Protection Degree	IP 66
Extraneous Light Immunity	Lamplight:3000Lux;Sunlight:10000Lux Max
Housing Material:Metal Housing	Housing and Nut:BRASS, NI Plated, Lens:PMMA
Adjustable Sensitivity:	YES--By Potentiometer
Cable	Length:2m, Material:PVC, Color:Gray
Weight:	K:116g, Z:96g, S:48g, M46:11g, M51:20g

O For PNP output. In case of NPN output, the connections must be inverted.

Advantages:
1.High performance with low cost
2.Quick delivery
3.Easy to use
4.Variety selection
5.International standard

Available types	FPR18-8-SE-SON-K FPR18-8-SE-SON-Z FPR18-8-SE-SON-S FPR18-8-SE-SOP-K FPR18-8-SE-SOP-Z FPR18-8-SE-SOP-S
Detection range	8M
Supply Voltage	DC10-30V ±20%, ripple(P--P):10% Max
Current Consumption	40 mA Max
Max Output Current	100 mA Max
Response Time; Switching Frequency	Less than 3.0 mS(ON+OFF);333 Hz
Circuit Protection	1. Output Over Current Protection
	2. Reverse-Polarity protected
	3. Interference suppression
Output Type	NPN or PNP open collector
Operation Mode	LIGHT-ON, DARK-ON selectable by control cable(White)
Light-on Operation(NO-Function)	Control cable (White wire) connected to 0V (Blue) ○
Dark-on Operation(NC-Function)	Control cable (White wire) connected to V+ (Brown) ○
Indicator	Yellow LED on, when Light is received
Ambient Temperature:	Operating Temperature:-25°~55°C
Protection Degree	IP 66
Extraneous Light Immunity	Lamplight:3000Lux;Sunlight:10000Lux Max
Housing Material:Plastic Housing	Housing and Nut:ABS resin, Color:Green, Lens:PMMA
Adjustable Sensitivity:	YES--By Potentiometer
Cable	Length:2m, Material:PVC, Color:Gray
Weight:	K:178g, Z:138g, S:42g

○ For PNP output. In case of NPN output, the connections must be inverted.

Available types	FMR18-8-SE-SON-K FMR18-8-SE-SON-Z FMR18-8-SE-SON-S FMR18-8-SE-SOP-K FMR18-8-SE-SOP-Z FMR18-8-SE-SOP-S
Detection range	8M
Supply Voltage	DC10-30V ± 20％, ripple(P--P):10％Max
Current Consumption	40 mA Max
Max Output Current	100 mA Max
Response Time; Switching Frequency	Less than 3.0 mS(ON+OFF);333 Hz
Circuit Protection	1. Output Over Current Protection
	2. Reverse-Polarity protected
	3. Interference suppression
Output Type	NPN or PNP open collector
Operation Mode	LIGHT-ON, DARK-ON selectable by control cable(White)
Light-on Operation(NO-Function)	Control cable (White wire) connected to 0V (Blue) ○
Dark-on Operation(NC-Function)	Control cable (White wire) connected to V+ (Brown) ○
Indicator	Yellow LED on, when Light is received
Ambient Temperature:	Operating Temperature:-25°~55°C
Protection Degree	IP 66
Extraneous Light Immunity	Lamplight:3000Lux;Sunlight:10000Lux Max
Housing Material:Metal Housing	Housing and Nut:BRASS, NI Plated, Lens:PMMA
Adjustable Sensitivity:	YES--By Potentiometer
Cable	Length:2m, Material:PVC, Color:Gray
Weight:	K:232g, Z:192g, S:96g

○ For PNP output. In case of NPN output, the connections must be inverted.

FIBER OPTIC TYPES with plastic case

Technical Data

Advantages:

1. High performance with low cost
2. Quick delivery
3. Easy to use
4. Variety selection
5. International standard

Available types	FPR18-FO-SON-K FPR18-FO-SON-Z FPR18-FO-SON-S FPR18-FO-SOP-K FPR18-FO-SOP-Z FPR18-FO-SOP-S
Detection range	ϕ1.0 Fiber D:4~5cm T:10cm
Supply Voltage	DC10-30V ± 20%, ripple(P--P):10% Max
Current Consumption	30 mA Max
Max Output Current	100 mA Max
Response Time; Switching Frequency	Less than 3.0 mS(ON+OFF);333 Hz
Circuit Protection	1. Output Over Current Protection
	2. Reverse-Polarity protected
	3. Interference suppression
Output Type	NPN or PNP open collector
Operation Mode	LIGHT-ON, DARK-ON selectable by control cable(White)
Light-on Operation(NO-Function)	Control cable (White wire) connected to 0V (Blue) ○
Dark-on Operation(NC-Function)	Control cable (White wire) connected to V+ (Brown) ○
Light Source	Red LED 660nm
Indicator	Yellow LED on, when Light is received
Ambient Temperature:	Operating Temperature:-25°~55°C
Protection Degree	IP 66
Extraneous Light Immunity	Lamplight:3000Lux;Sunlight:10000Lux Max
Housing Material:Plastic Housing	Housing and Nut:ABS resin, Color:Green, Lens:PMMA
Adjustable Sensitivity:	YES--By Potentiometer
Cable	Length:2m, Material:PVC, Color:Gray
Weight:	K:88g, Z:68g, S:20g

○ For PNP output. In case of NPN output, the connections must be inverted.

Advantages:
1. *High performance with low cost*
2. *Quick delivery*
3. *Easy to use*
4. *Variety selection*
5. *International standard*

Available types	FMR18-FO-SON-K FMR18-FO-SON-Z FMR18-FO-SON-S FMR18-FO-SOP-K FMR18-FO-SOP-Z FMR18-FO-SOP-S
Detection range	ϕ1.0 Fiber D:4~5cm T:10cm
Supply Voltage	DC10-30V ± 20%, ripple(P--P):10% Max
Current Consumption	30 mA Max
Max Output Current	100 mA Max
Response Time; Switching Frequency	Less than 3.0 mS(ON+OFF);333 Hz
Circuit Protection	1. Output Over Current Protection
	2. Reverse-Polarity protected
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Output Type	NPN or PNP open collector
Operation Mode	LIGHT-ON, DARK-ON selectable by control cable(White)
Light-on Operation(NO-Function)	Control cable (White wire) connected to 0V (Blue) ○
Dark-on Operation(NC-Function)	Control cable (White wire) connected to V+ (Brown) ○
Light Source	Red LED 660nm
Indicator	Yellow LED on, when Light is received
Ambient Temperature:	Operating Temperature:-25°~55°C
Protection Degree	IP 66
Extraneous Light Immunity	Lamplight:3000Lux;Sunlight:10000Lux Max
Housing Material:Metal Housing	Housing and Nut:BRASS, NI Plated, Lens:PMMA
Adjustable Sensitivity:	YES--By Potentiometer
Cable	Length:2m, Material:PVC, Color:Gray
Weight:	K:115g, Z:95g, S:47g

○ For PNP output. In case of NPN output, the connections must be inverted.

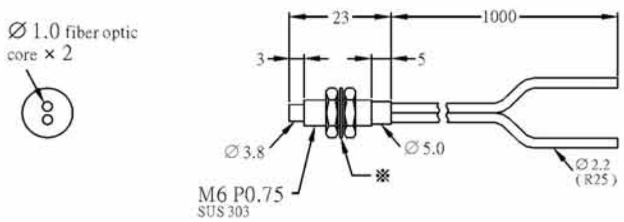
FIBER OPTICS FOR CONNECTING TO FIBER OPTIC PHOTOSENSORS

F R _ - 6 1 0 - _ - _

- Q No Screw thread
- I Sleeve Length 10mm
- M Sleeve Length 40mm
- L Sleeve Length 90mm
- S Sleeve Length 20mm
- □ No Sleeve
- 10 Fiber Length 1000 mm
- 6 Head diameter M6
- 5 Head diameter Ø5
- 4 Head diameter M4, Ø4
- 3 Head diameter M3, Ø3
- X Long sensing range...1.5mm/2.20
- C Coaxial...0.25mmX16/1.0mmX1, 0.25mmX9/0.5mmX1
- Y Flexible R2 fiber...1.0mm/2.20
- H Heat resistant....115℃
- R Plastic fiber reflective type
- T Plastic fiber thrubeam type

FR-610

Free cut



FR-610-M

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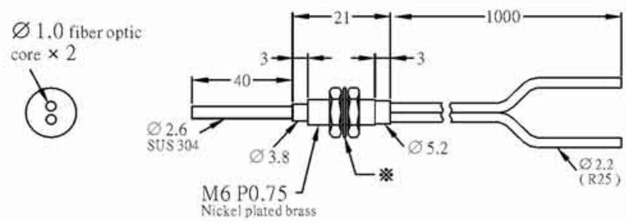

FR-610-I

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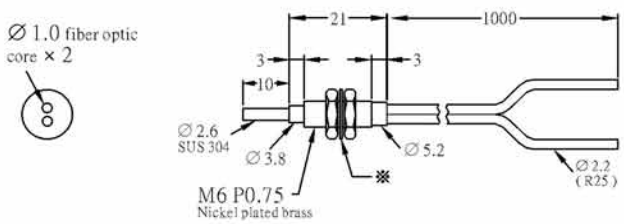

FR-610-L

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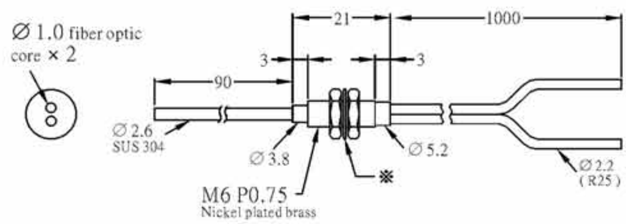

FRC-610

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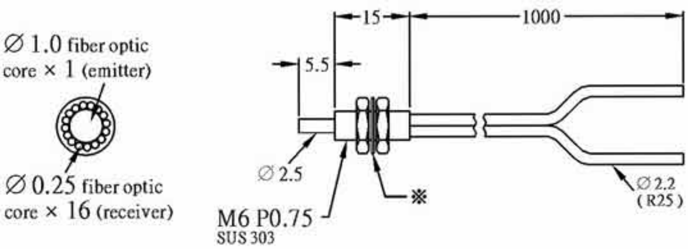

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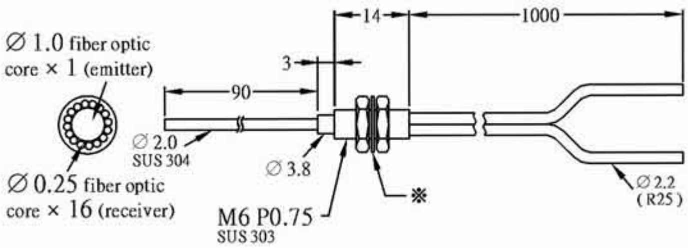

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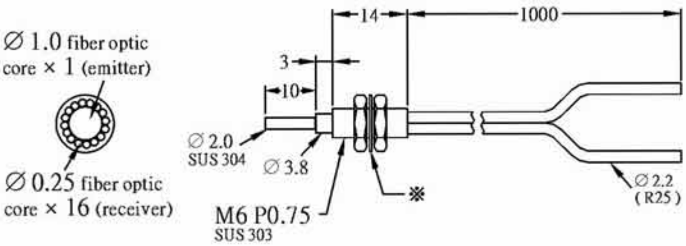
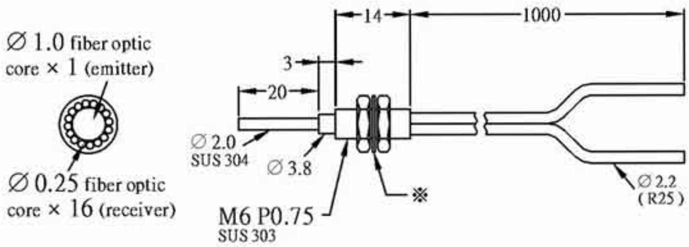


FRC-610-S

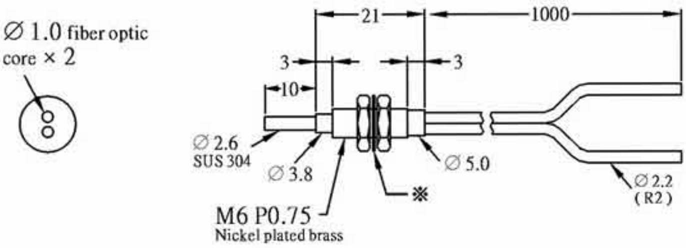
Free cut



FRY-610-I

Minimum bend radius R2

Free cut



FRY-610

Minimum bend radius R2

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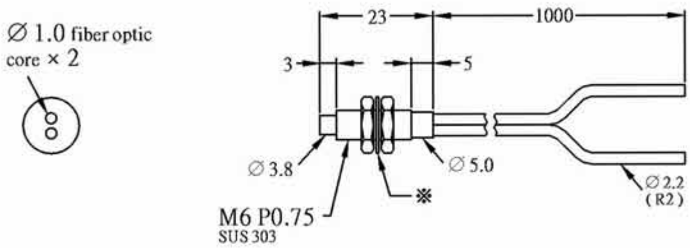
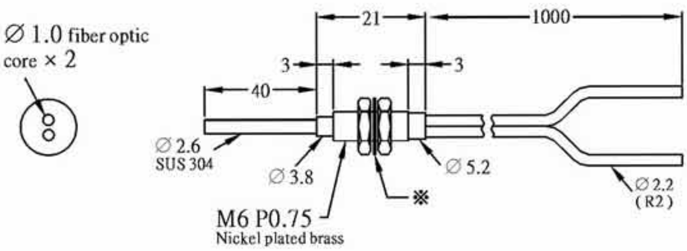


FRY-610-M

Minimum bend radius R2

Free cut



FRY-610-L

Minimum bend radius R2

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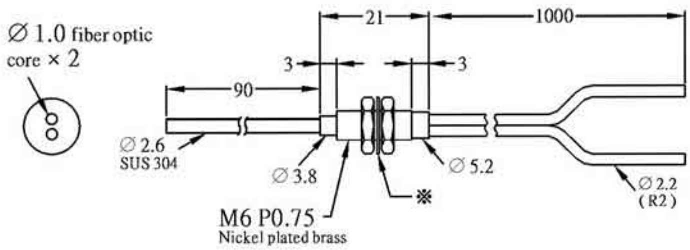

FRC-310

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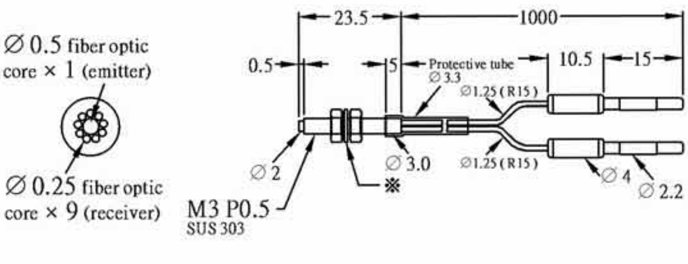

FRC-310-I

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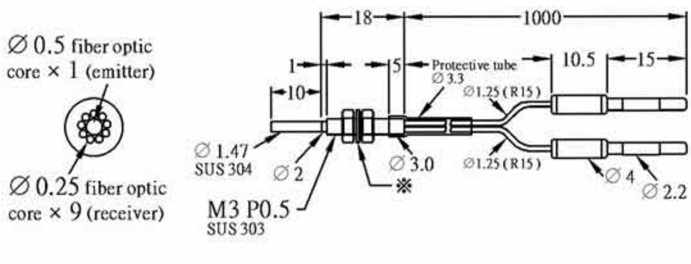

FRC-310-M

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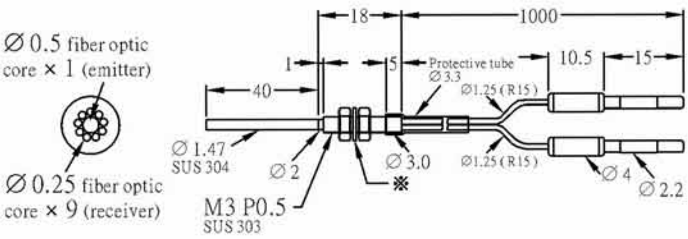

FT-610

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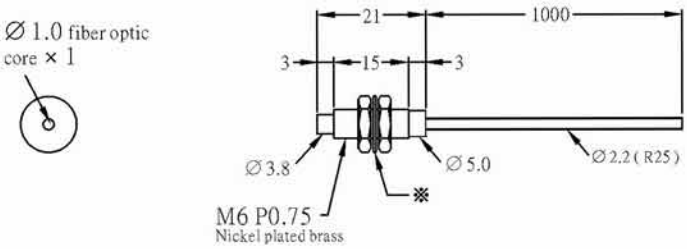

FT-610-I

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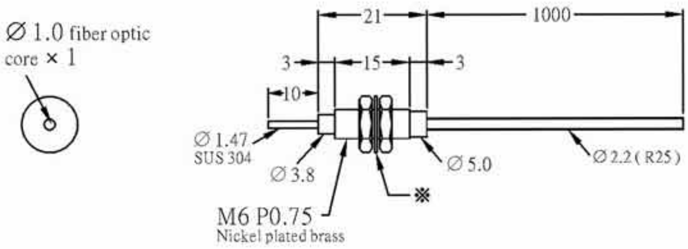

FT-610-L

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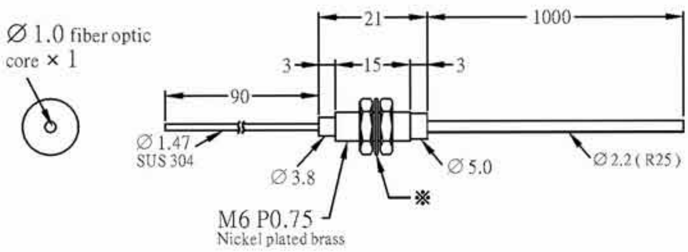

FTX-610

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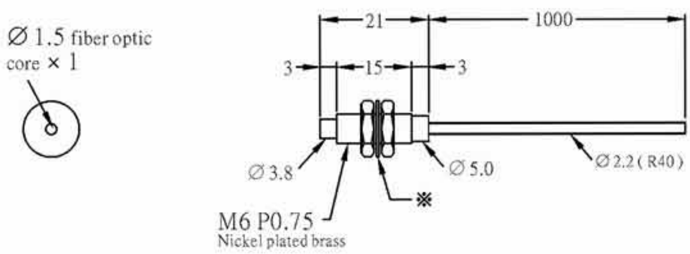

FTX-610-M

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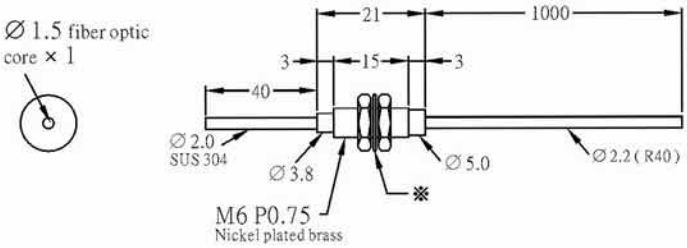
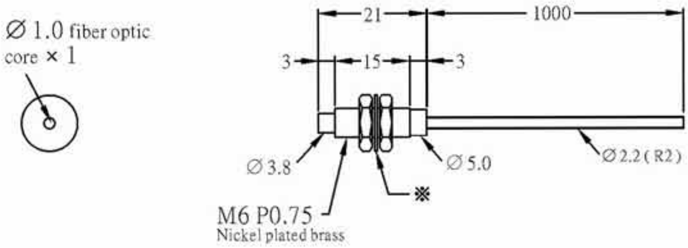


FTY-610

Minimum bend radius R2

Free cut



FT-510

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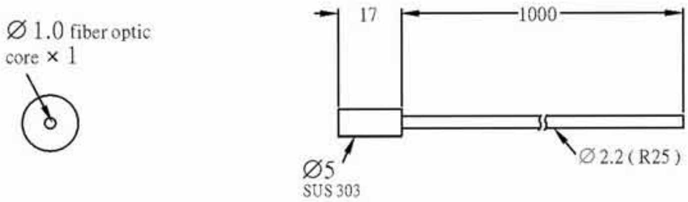

FT-510-I

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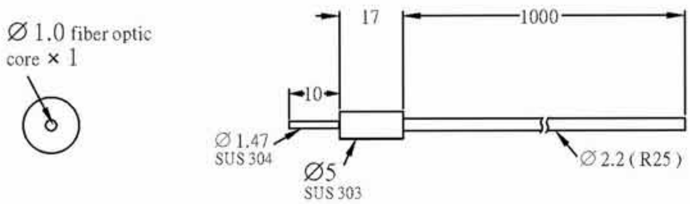

FT-510-S

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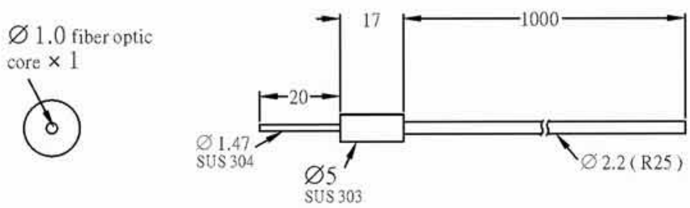

FT-510-M

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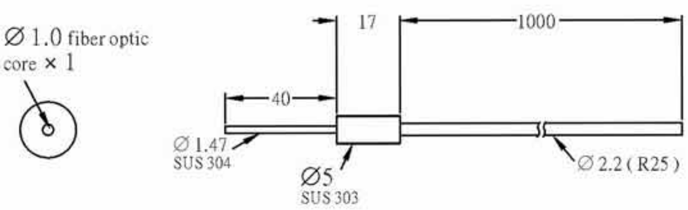

FTX-410-S

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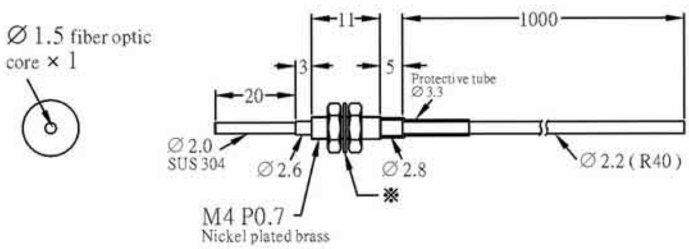

FT-510-L

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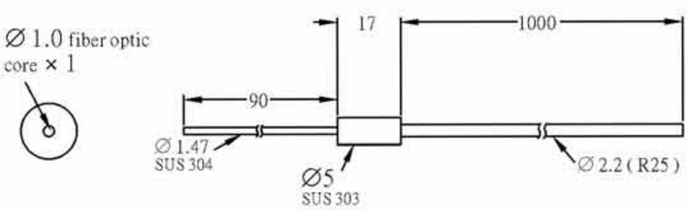

FTX-410-M

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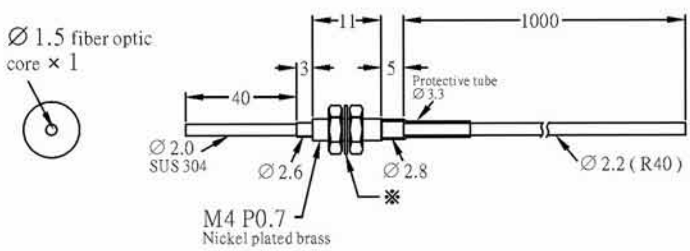

FT-410

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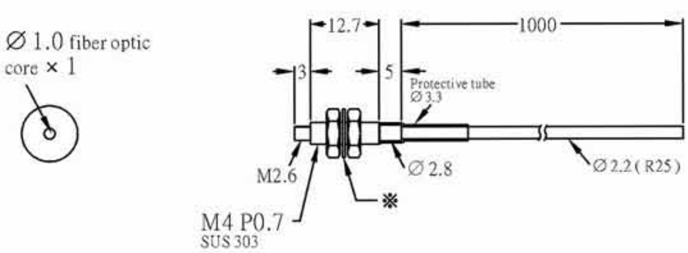

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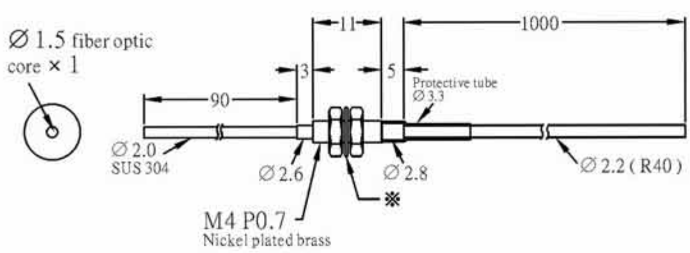

FTX-410

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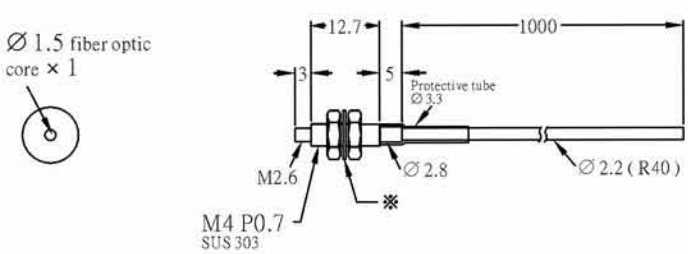
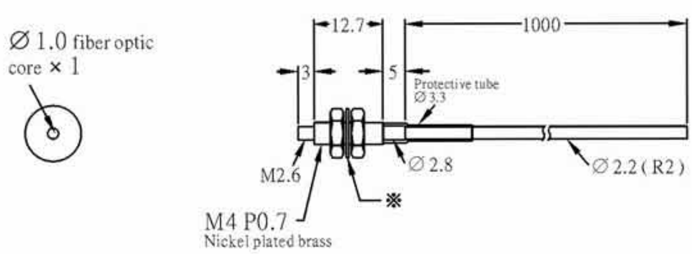


FTY-410

Minimum bend radius R2

Free cut



FTX-410-I

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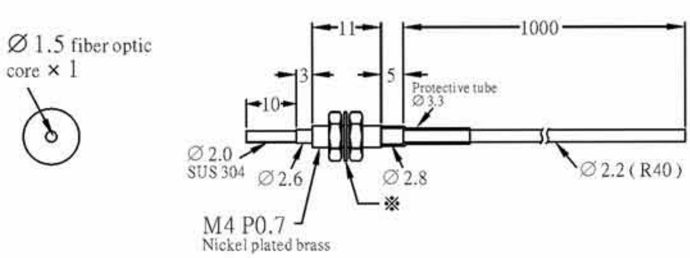
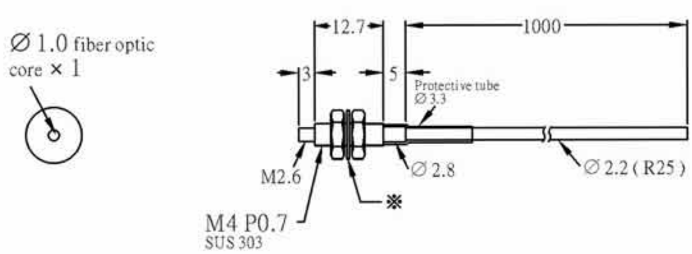


FTH-410

Heat Resistant 115°C

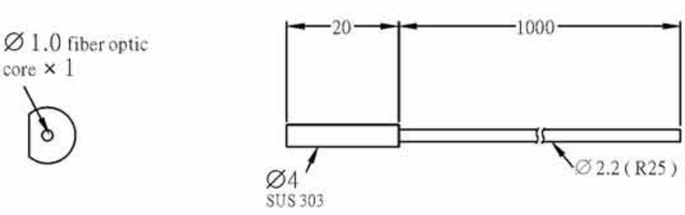
Free cut



FTH-410-Q

Heat Resistant 115°C

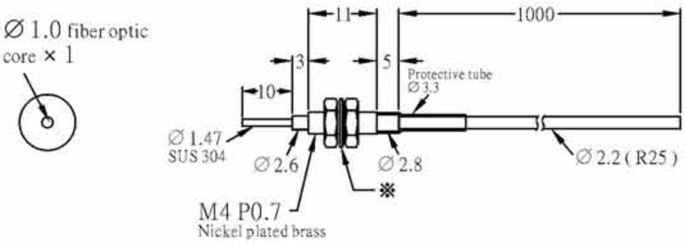
Free cut



FTH-410-I

Heat Resistant 115°C

Free cut



FTH-410-S

Heat Resistant 115°C

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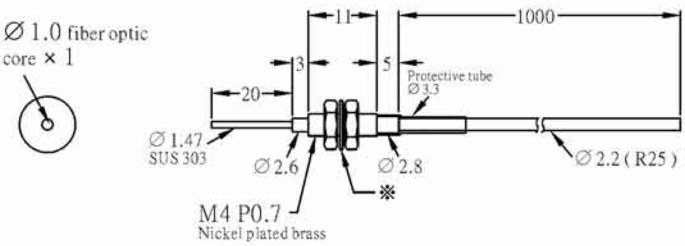

FTH-410-M

Heat Resistant 115°C

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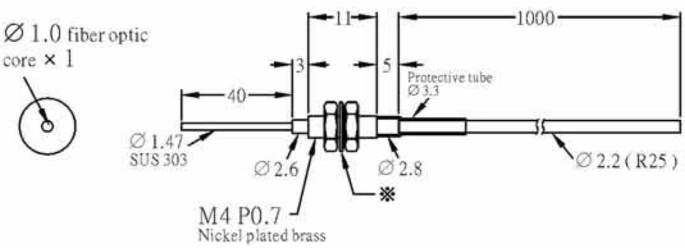

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TYPE 4.8 x 4 CP-2M (2 meter cable)

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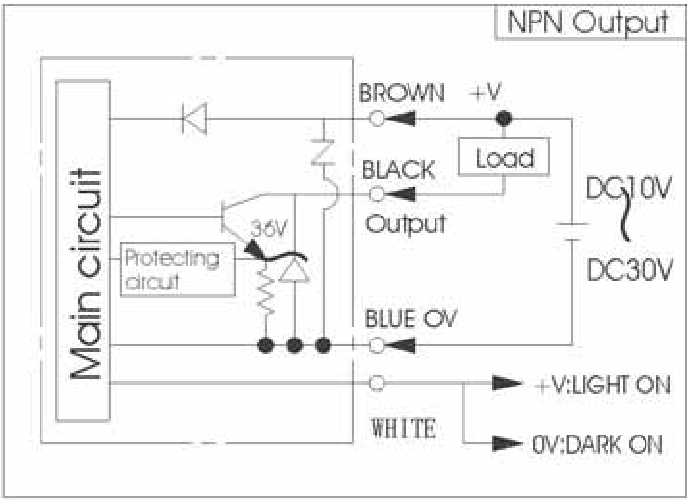
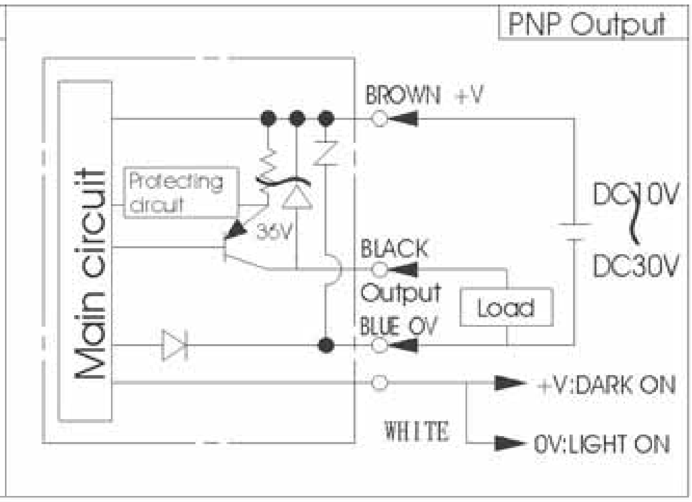
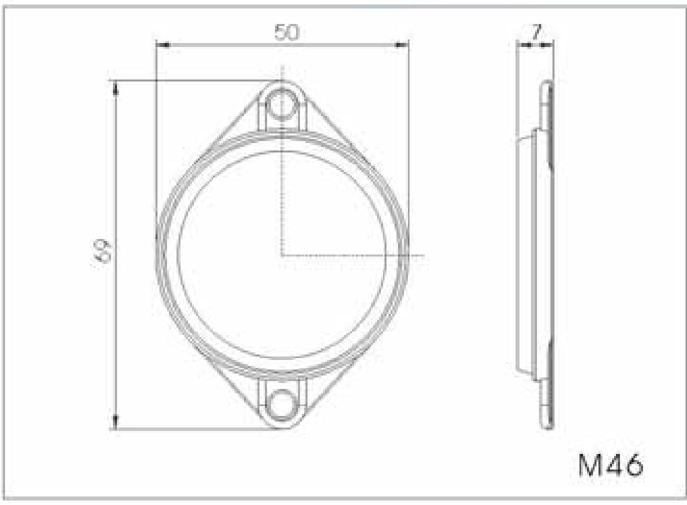
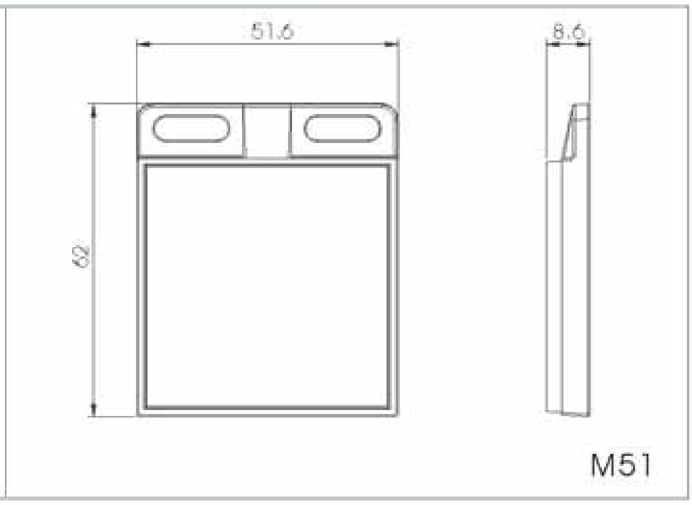
Wiring Diagram



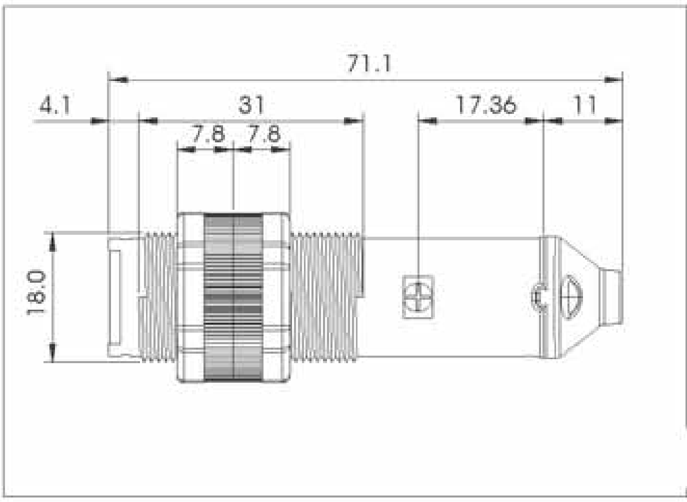


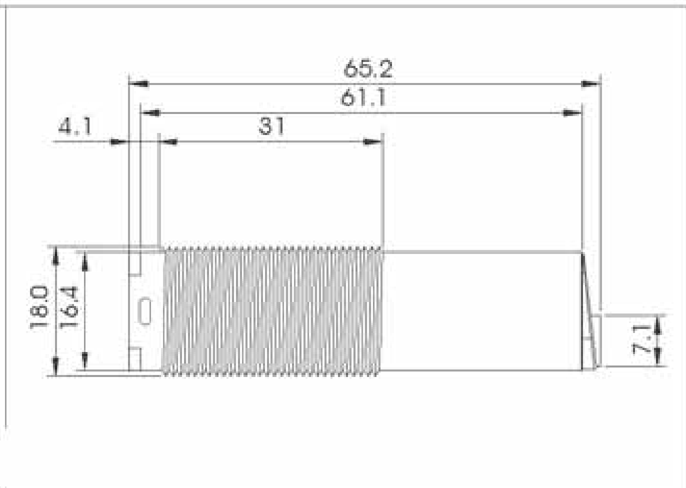
Reflector(Unit in mm)





Dimensions(Unit in mm)





LASER
MEASURING SYSTEMS

La nuova generazione di fotosensori "FP" e "FM" sfrutta tutte le esperienze realizzate in 30 anni di applicazioni nei settori più svariati dell'automazione civile ed industriale.

Grazie all'utilizzo di un nuovo chip ad elevata tecnologia è possibile ottenere gli stessi vantaggi forniti dai sensori molto più costosi: **regolazione della sensibilità (distanza), inversione della funzione NO/NC con un semplice collegamento a massa di un filo, frequenza di commutazione fino a ~350 Hz, possibilità di collegamento a fibre ottiche a tasteggio diretto e a barriera di varie dimensioni e caratteristiche.**

Ogni applicazione richiede comunque la massima attenzione ai parametri fondamentali necessari per una scelta accurata del modello più rispondente alle necessità dell'impianto o della macchina su cui il sensore deve operare.

CAMPO DI INTERVENTO:
DISTANZA IN MILLIMETRI DALL'OGGETTO DA RILEVARE ENTRO LA QUALE IL SENSORE REAGISCE CON UN SEGNALE ADEGUATO

ISTERESI:
DIFFERENZA FRA IL PUNTO D'INTERVENTO (output ON) IN AVVICINAMENTO DEL TARGET E IL PUNTO DI RILASCIO (output OFF) IN ALLONTANAMENTO DEL TARGET RISPETTO ALLA TESTA DEL SENSORE. PER I FOTOSENSORI FM-FP E' ~10% DEL CAMPO DI INTERVENTO

TEMPO DI RISPOSTA:
TEMPO MINIMO NECESSARIO PER RILEVARE LA PRESENZA DELL'OGGETTO

TEMPERATURA AMBIENTE:
MASSIMO VALORE DI TEMPERATURA SOPPORTABILE DAL SENSORE SENZA INFLUENZARE NEGATIVAMENTE LE SUE PRESTAZIONI

TARGET:
OGGETTO DA RILEVARE. I DATI DEL CATALOGO SONO RIFERITI A CARTA KODAK DIMENSIONI 200x200 mm OPPURE AI CATARIFRANGENTI M46 E M51. PER ALTRI MATERIALI LA DISTANZA DI INTERVENTO PUO' VARIARE IN PIU' O IN MENO SECONDO IL POTERE RIFLETTENTE DELLA SUPERFICIE, LE SUE DIMENSIONI E IL GRADO DI ORTOGONALITA' DELLA STESSA. PER LE BARRIERE (EMETTITORE + RICEVITORE) LA DIMENSIONE MINIMA DEL TARGET DA INTERCETTARE DIPENDE DALLA DISTANZA FRA EMETTITORE E RICEVITORE E DALLA REGOLAZIONE DELLA SENSIBILITA' SUL RICEVITORE

The new generation of "FP" and "FM" photosensors takes advantage of the experiences carried out during 30 years of applications in the most various fields of industrial and civil automation.

Thanks to the use of the new high technology chip it is possible to obtain the same advantages given by much more expensive sensors: **sensitivity adjustment (distance), NO/NC function inversion with a simple earth connection of a wire, switching frequency up to ~350 Hz, possibility to connect to reflective and thru beam fiber optics of various dimensions and features**.

Anyway every application calls for the utmost attention to the fundamental parameters needed for an accurate choice of the most suitable model meeting the requirements of the plant or the machine on which the sensor has to work.

OPERATING RANGE:
DISTANCE IN MILLIMETERS FROM THE OBJECT TO DETECT WITHIN WHICH THE SENSOR RESPONDS WITH AN ADEGUATE SIGNAL

HYSTERESIS:
DIFFERENCE BETWEEN THE OPERATING POINT (output ON) NEARING TO THE TARGET AND THE RELEASE POINT (output OFF) GETTING AWAY FROM THE TARGET IN COMPARISON TO THE SENSOR HEAD. FOR THE "FM" AND "FP" PHOTOSENSORS IT IS ~10% OF THE OPERATING RANGE

RESPONSE TIME:
MINIMUM TIME NEEDED TO DETECT THE OBJECT PRESENCE

ROOM TEMPERATURE:
MAXIMUM TEMPERATURE VALUE WHICH THE SENSOR CAN BEAR WITHOUT NEGATIVELY INFLUENCING ITS PERFOMANCES

TARGET:
OBJECT TO DETECT. THE CATALOGUE DATA REFER TO 200X200 mm KODAK PAPER OR TO M46 AND M51 REFLECTORS. FOR OTHER MATERIALS THE OPERATING DISTANCE CAN VARY MORE OR LESS ACCORDING TO THE REFLECTING POWER OF THE SURFACE, ITS DIMENSIONS AND THE ORTHOGONALITY LEVEL OF THE SAME. FOR THE THRU BEAM (EMITTER + RECEIVER) TYPES THE MINIMUM DIMENSION OF THE TARGET TO DETECT DEPENDS ON THE DISTANCE BETWEEN EMITTER AND RECEIVER AND ON THE SENSITIVITY ADJUSTMENT ON THE RECEIVER