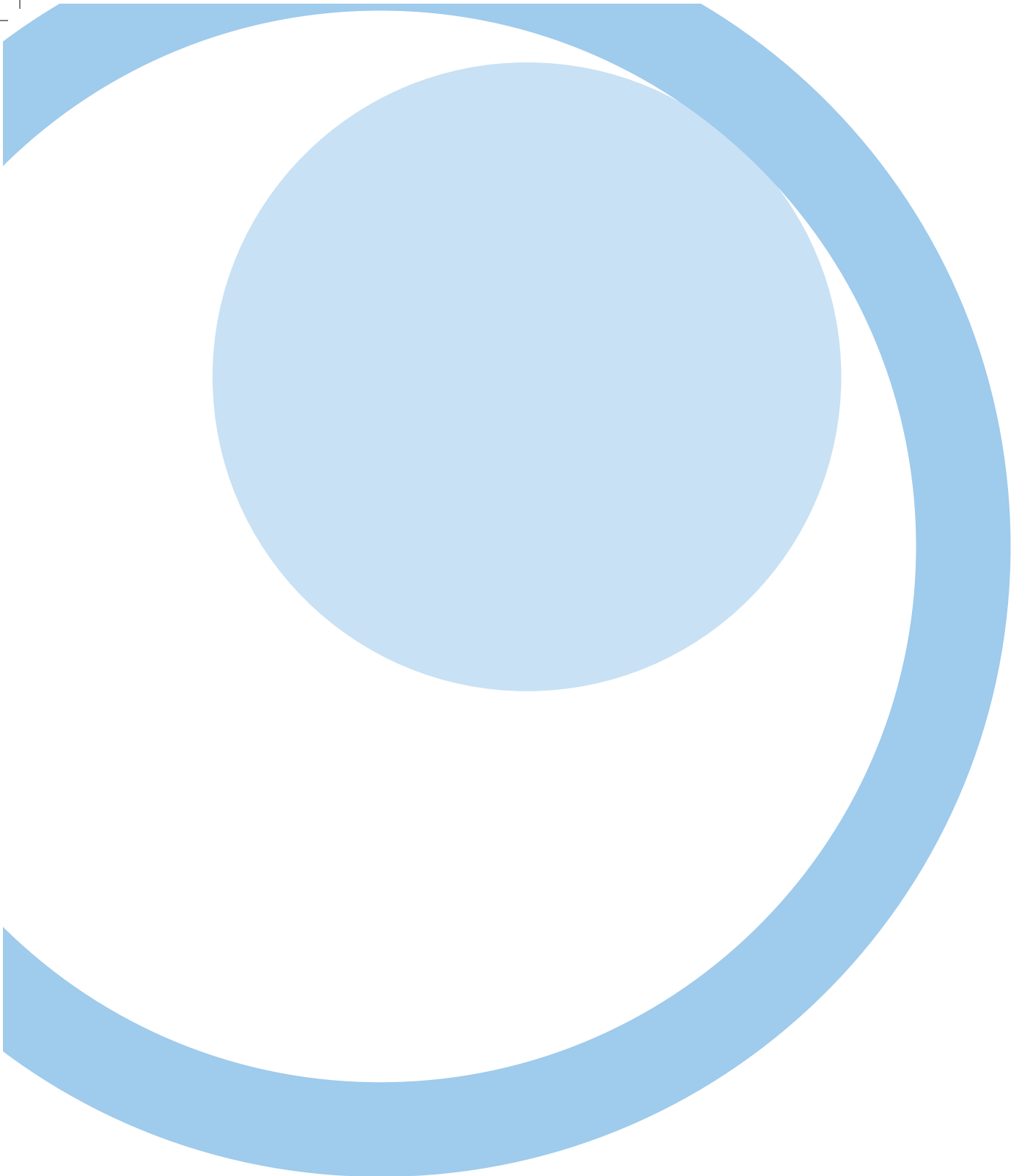




Fibre optic amplifiers





SSF series

M18 photoelectric sensors
for optical fibres



M18 sensors
for optical fibres

features

- Models with sensitivity adjustment by teach-in button
- With range of optical fibres are available
- LED status indicator for all versions
- Complete protection against electrical damages
- Approvals: CE and cULus listed



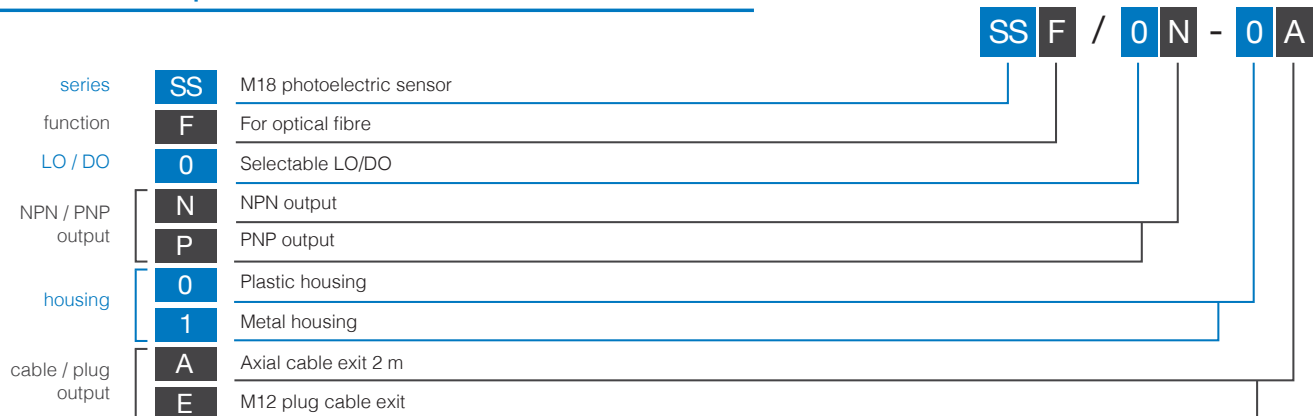
web contents



- Application notes
- Photos
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code description



available models

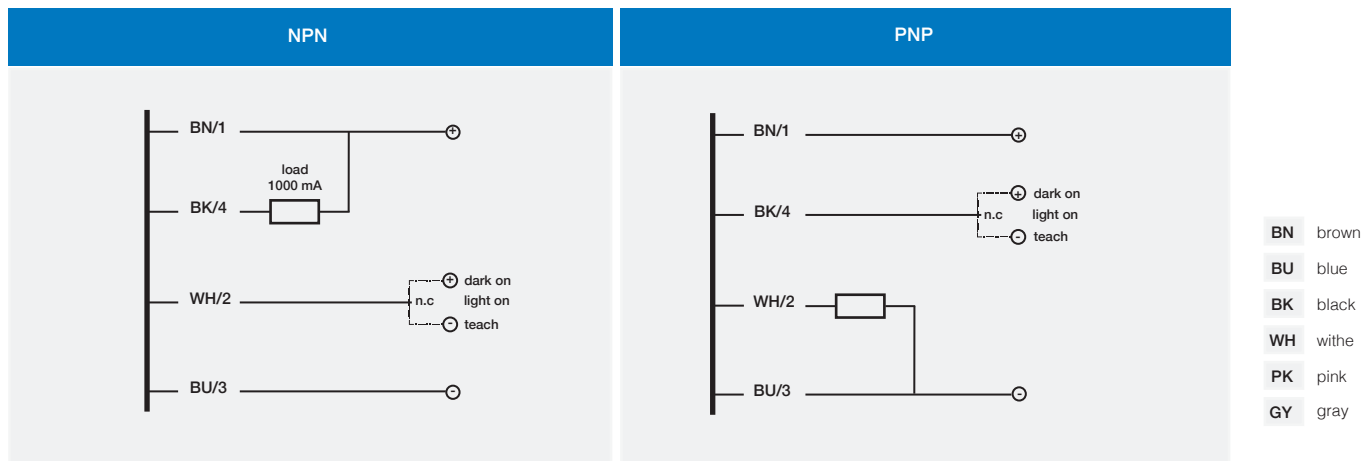
dimensions	housing	adjustment	plug	PNP		NPN	
				NO / NC	NO / NC		
M18	plastic	Teach-In	cable	SSF/0P-0A	SSF/0N-0A		
			M12	SSF/0P-0E	SSF/0N-0E		
	metallic		cable	SSF/0P-1A	SSF/0N-1A		
			M12	SSF/0P-1E	SSF/0N-1E		



SSF/0* - **	
nominal sensing distance	depending on optical fibres
emission	red (660 nm)
tolerance	+ 15 %...- 5 %
differential travel	≤ 10 %
repeat accuracy	5 %
operating voltage	10...30 Vdc
ripple	≤ 10 %
load current	100 mA
no-load current	≤ 20 mA
leakage current	≤ 10 µA
output voltage drop	2 V max
output type	NPN or PNP - LO / DO selectable
switching frequency	800 Hz
power on delay	150 ms
power supply protections	polarity reversal, transient
output electrical protections	short circuit (autoreset)
temperature range	- 25°C...+ 70°C (without freeze)
temperature drift	10 % Sr
external lighth interference	3,000 lux (incandescent lamp) 10,000 lux (sunlight)
protection degree	IP67 (EN60529) ⁽¹⁾
LEDs	yellow
sensitivity adjustment	Teach-In
housing material	PBT (plastic), nickel-plated brass (metal)
optic material	depending on optical fibres
tightening torque	1 Nm (plastic housing), 25 Nm (metallic housing)
weight (approximate)	plastic version: 30 g connector / 100 g cable metallic version: 70 g connector / 130 g cable

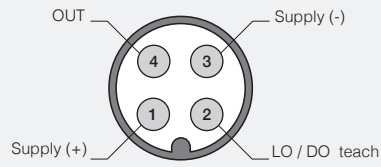
⁽¹⁾ Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections

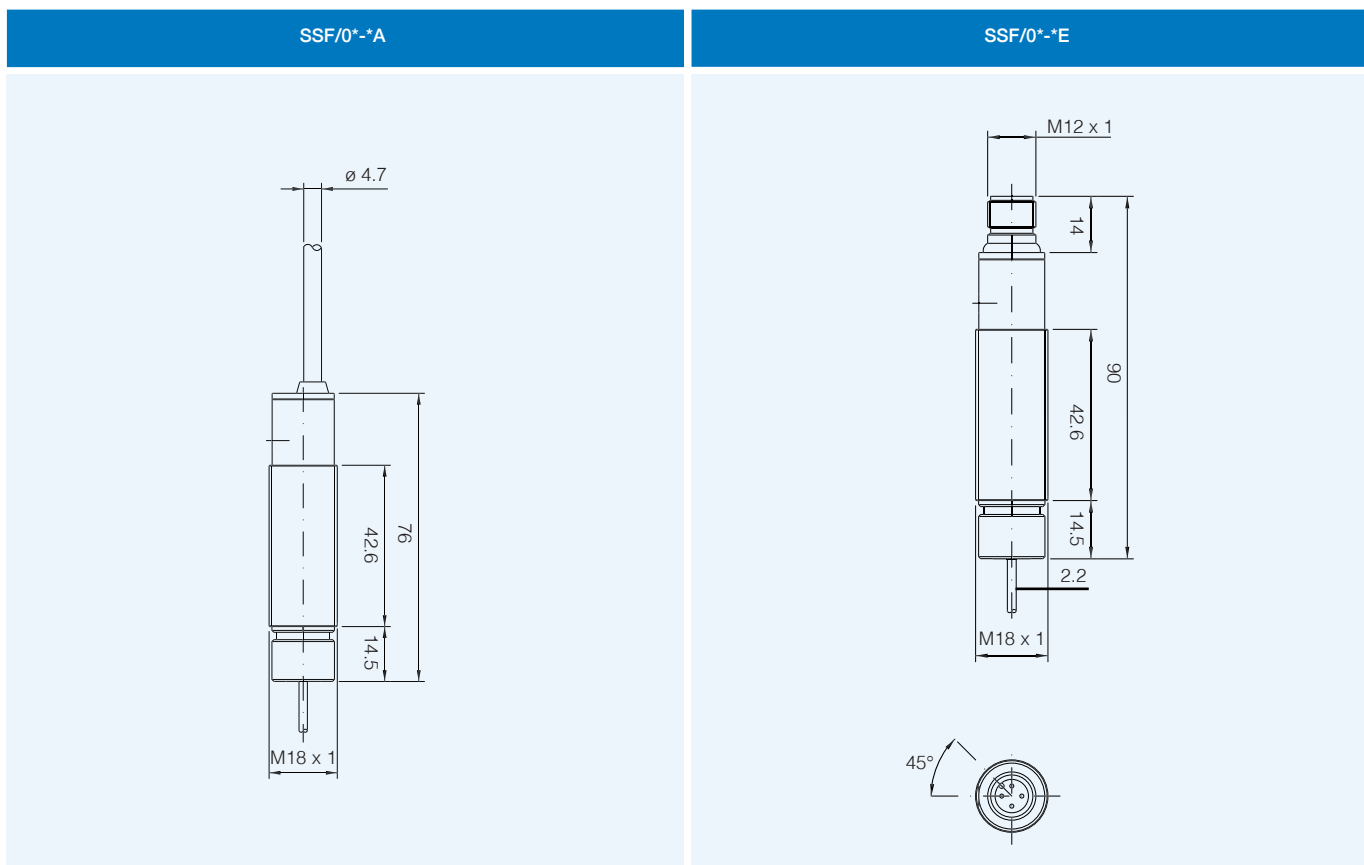


In case both the dark on and remote teach in functions are necessary connect a pull up resistor of 2,2 kΩ between Wh/2 and Bn/1.

M12

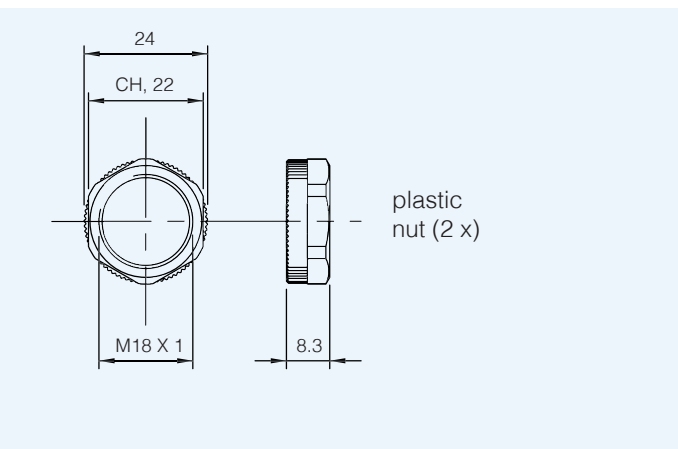


dimensions (mm)



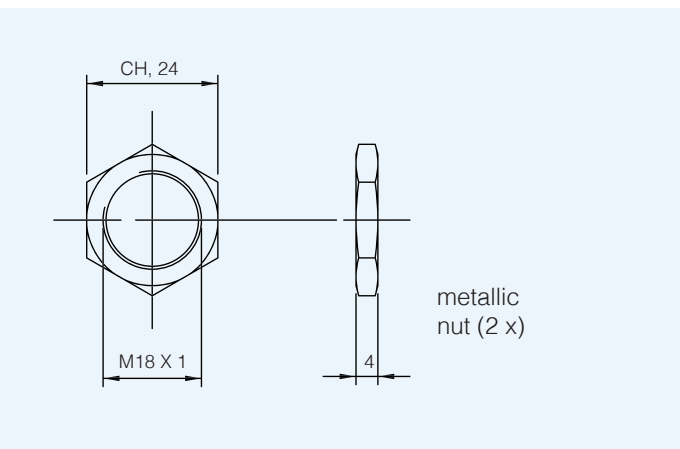
dimensions (mm)

accessories included in all plastic models



dimensions (mm)

accessories included in all metallic models





20 horizontal light blue bars for writing notes.



FS1 series

Cubic amplifier
unit for optical fibres - DC



Cubic amplifier
unit for optical fibres - DC

features

- Extremely reduced dimensions amplifier units (only 49 x 26 x15 mm)
- Right angle cable exit or M12 plug cable for reducing the overall dimensions at minimum
- Trimmer for sensivity adjustment
- NPN or PNP outputs with selectable NO/NC
- Red light beam with visible spot
- Wide range of optical fibres (plastics and glass)
- Complete protection against electrical damage
- Fixing with M4 screws (2xM4, 20 mm step)



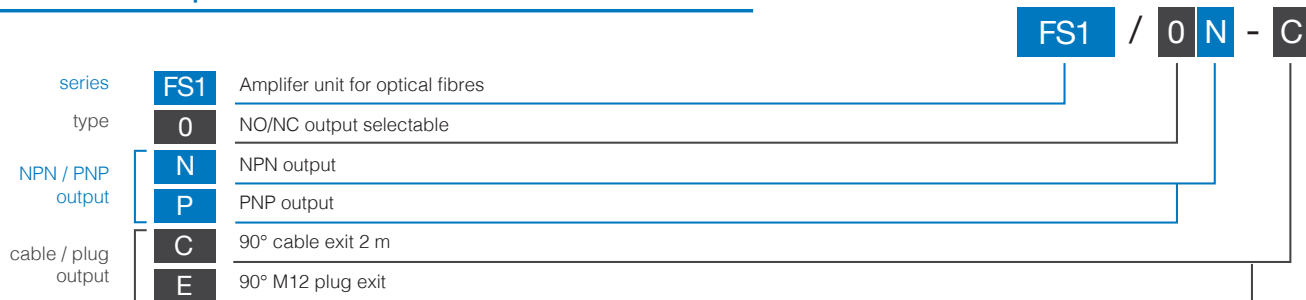
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code description



available models

dimensions (mm)	series	DIN rail	adjustment	exit	PNP	NPN
					NO / NC	NO / NC
15 x 26 x 67	FS1	-	trimmer	cable	FS1/0P-C	FS1/0N-C
				M12	FS1/0P-E	FS1/0N-E



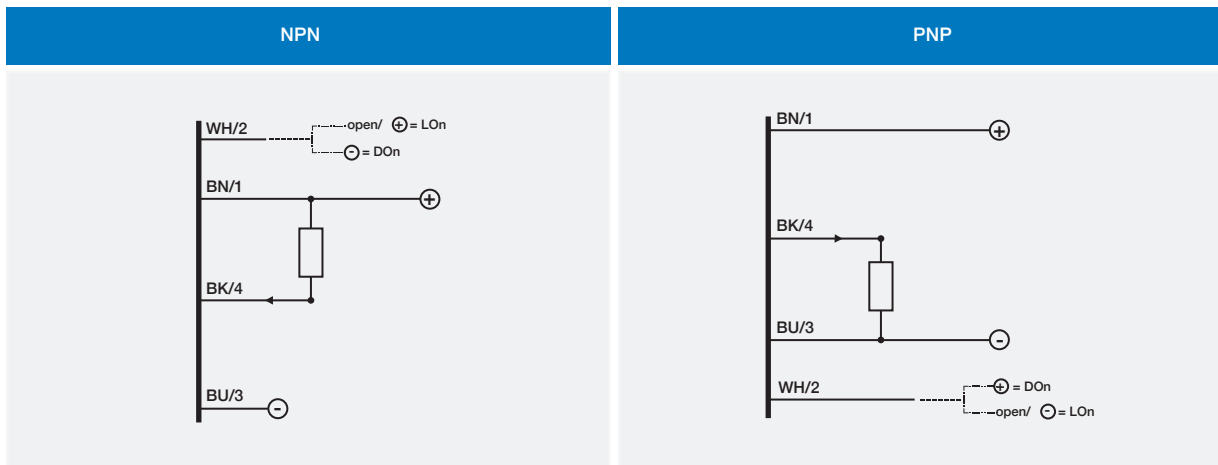
technical specification

Cubic amplifier
unit for optical fibres - DC

	FS1/0*-*
sensing distance	see optical fibres table
emission	red (660 nm)
operating voltage	10...30 Vdc
ripple	≤ 10 %
no-load supply current	100 mA
load current	30 mA
voltage drop	1.2 V max
output type	NPN or PNP - NO / NC selectable
switching frequency	1 kHz
power on delay	200 ms
power supply protections	polarity reversal, transient
output electrical protections	short circuit (autoreset)
sensitivity adjustment	1 turn trimmer
temperature range	- 25°C...+ 70°C (without freeze)
external lighth interference	3,000 lux (incandescent lamp) 10,000 lux (sunlight)
protection degree	IP65 (EN60529) ⁽¹⁾
LEDs	red (output NO energized)
housing material	Polyamide
optic material	depending by optical fibres
weight (approximate)	50 g connector / 120 g cable (20 g mount bracket)

⁽¹⁾ Protection guaranteed only with plug cable well mounted.

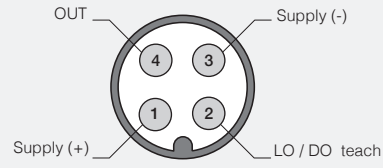
electrical diagrams of the connections



Maximum admissible capacity C=0,2μF, for maximum output voltage and current.
 Indications NO and NC are referred to the diffuse reflection optical fibres (on target absence).
 For retro-reflective and through-beam models the indication NO to be replaced by NC and NC becomes NO.



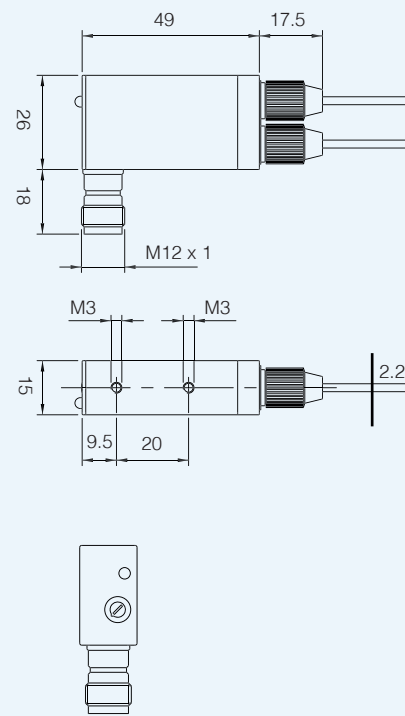
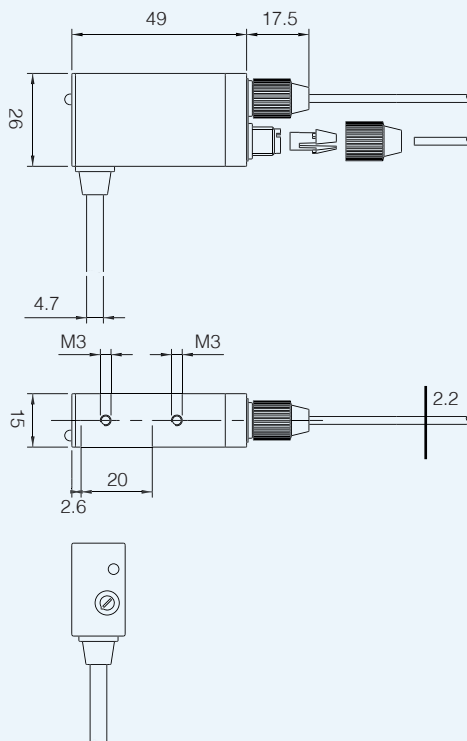
M12



dimensions (mm)

FS1/0*-C

FS1/0*-E





26 horizontal light blue bars for writing notes.



F series

Photoelectric sensors
for DIN-rail mounting



Photoelectric sensors
for DIN-rail mounting

features

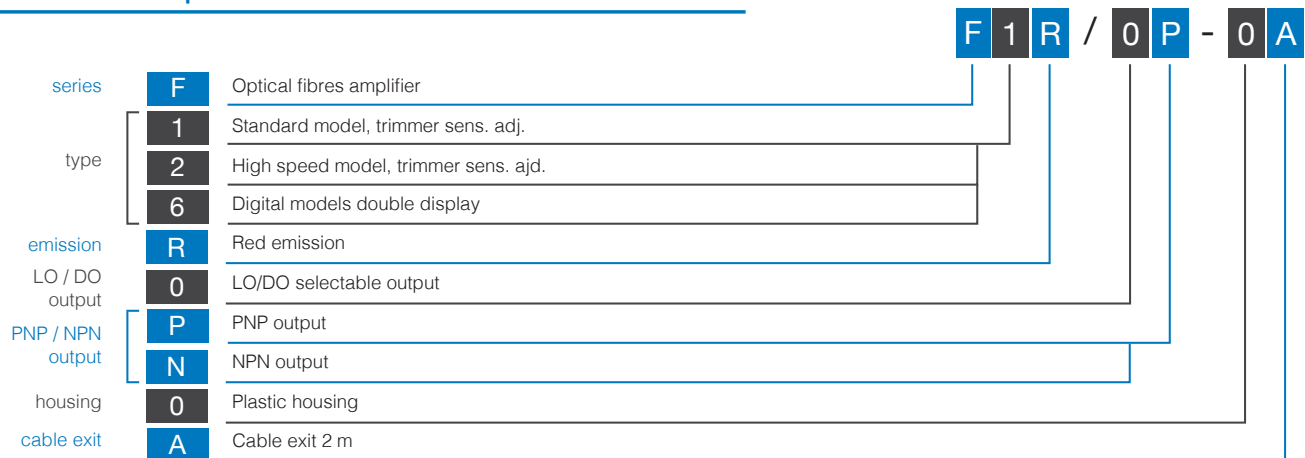
- Models with trimmer sensitivity
- Models with Teach-In
- Double digital display
- High switching frequency
- Approvals: CE

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code description



available models

output	adjustment	switching frequency	PNP output	NPN output
cable	trimmer	standard	F1R/0P-0A	F1R/0N-0A
		high speed	F2R/0P-0A	F2R/0N-0A
	Teach-In	standard	F6R/0P-0A	F6R/0N-0A



technical specification

Photoelectric sensors
for DIN-rail mounting

	standard F1R/0*-0A	high speed F2R/0*-0A	digital F6R/0*-0A
nominal sensing distance	depending on fibre used 36 mm		
emission	red (680 nm)		red (650 nm)
diffential travel	≤15 %		
repeat accuracy	5 %		
operating voltage	12...24 Vdc		
ripple	≤10 %		
no-load supply current	< 35 mA		< 40 mA
load current	50 mA max		
leakage current	< 10 µA		
output voltage drop	1 V max		
output type	NPN or PNP - LO / DO selectable		
responce time	200 µs max	ON: 20 µs OFF: 30 µs	1ms
power on delay	≤ 200 ms		
power supply protections	polarity reversal		
output electrical protections	short circuit		
sensitivity adjustment	trimmer (8 giri)		Teach-In
operative Temperature range	-25...+55° C (without freeze)		
storage temperature	-30...+70° C (without freeze)		
EMC	in conformity with the EMC Directive according to EN 60947-5-2		
interference by external light	10.000 lux (incandescent lamp) 20.000 lux (sunlight)		
protection degree	IP50 (according to: IEC 60529)		
LEDs	orange (output active) green (n.4 - received signal level) red (no received signal)		orange (output active) 8 bits display (n.4 red: incidentsignal; n.4 green: threshold level)
housing material	PBT (housing); PC (cover)		
weight (approximate)	70 g (approx.)		

value tabel

The values shown in the following tables are measured, by using our CF/CB1 optical fibre, set to obtain an hysteresis of about 15% with all type of amplifier.

glass optical fibres CV series (mm)

F1 series		F2 series		F6 series		models
-	-	70	90	-	-	CV-CB1
						CV-CB3
410	500	200	240	800	925	CV-RB4
						CV-RB6



plastic optical fibres of series (mm)

F1 series		F2 series		F6 series		models
ON 90 %	OFF 90 %	ON 90 %	OFF 90 %	ON 90 %	OFF 90 %	
0	0	0	0	0	0	CF/CA1
40	47	15	18	100	115	CF-CA2 CF-CA4
100	130	60	68	300	350	CF-RA4 CF-RA7
150	180	70	90	300	345	CF-CB1 CF-CB3
410	500	200	240	800	925	CF-RB3 CF-RB4 CF-RB6
4,000	4,000	2,400	2,800	> 4,000 EX.G. = 12		CF-RB9 CF-RBA
50	58	20	25	90	115	CF-CC1
350	400	190	220	600	690	CF-RC6
2,200	2,600	1,600	1,900	> 4,000 EG = 12		CF-RC9 CF-RCA

accessories for CF series optical fibres (mm)

series F1	series F2	series F6	model fibres	models
Sn	Sn	Sn	CF-RB3-20	
400	200	800	CF-RB3-20	AF/ER9
1,500	1,000	3,000	CF-RBA-** CF-RCA-20	ST28

modular fibres for any application AF series (mm)

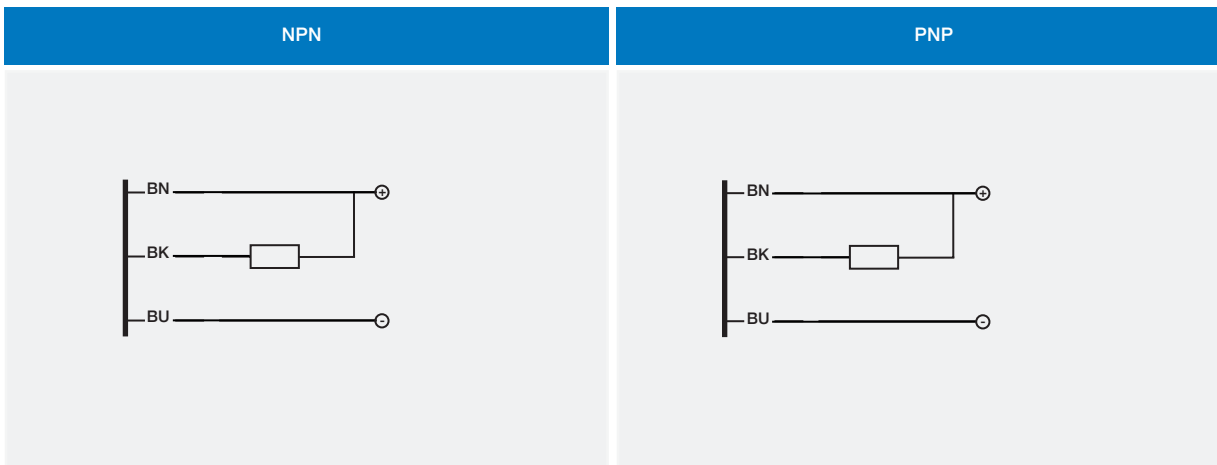
series F1	series F2	series F6	models
Sn	Sn	Sn	
1,500	700	3,000	AF/ER4
2,200	1,000	4,500	AF/ER5
4,500	2,000	6,000	AF/ER6 AF/ER7

accessories for CV series optical fibres (mm)

series F1	series F2	series F6	models
Sn	Sn	Sn	
-	20	-	AF/FC1
-	30	-	AF/FC2
3,000	2,000	6,000	AF/ER1
4,000	3,000	8,000	AF/ER2
10,000	8,000	14,000	AF/ER3

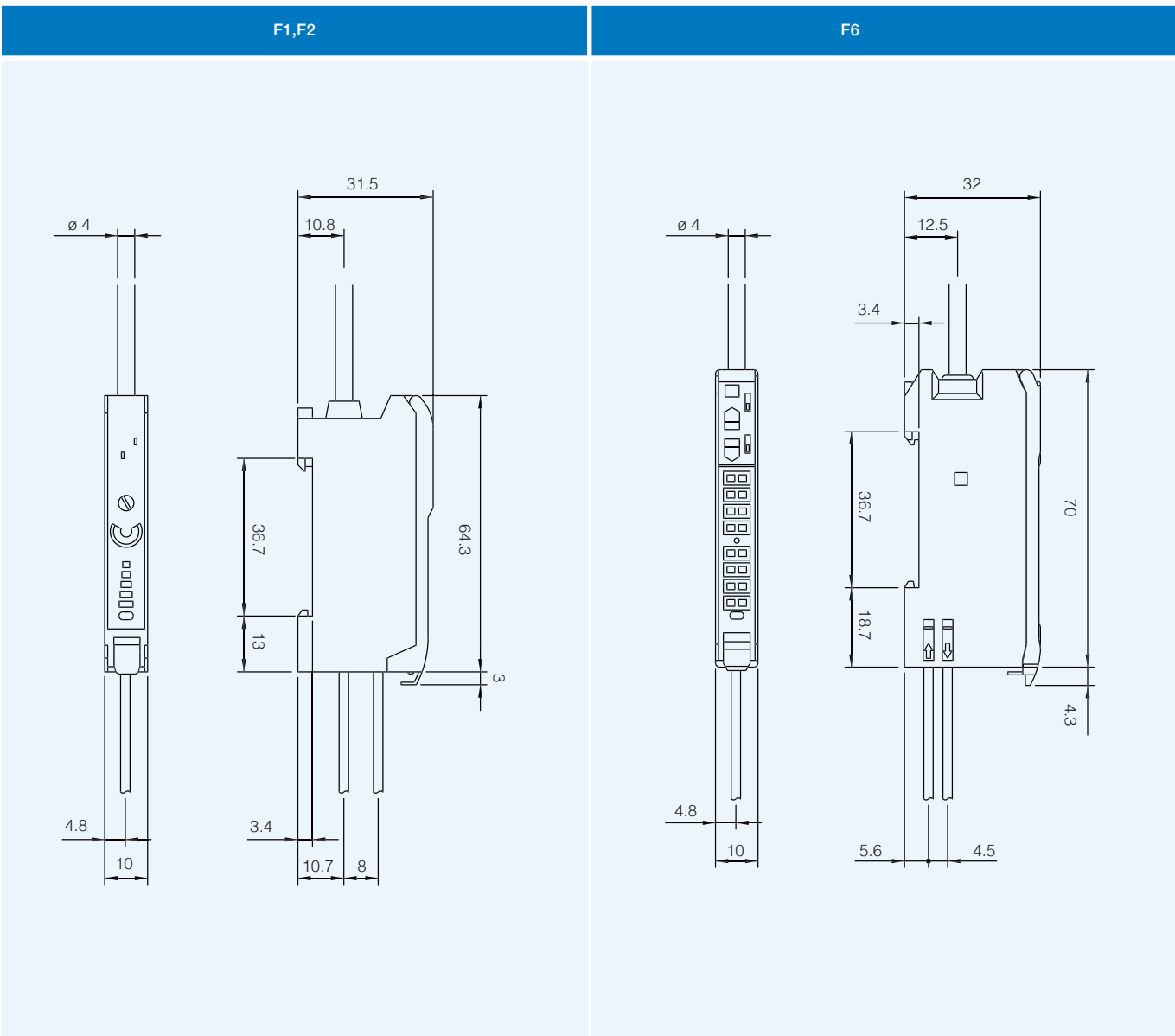


electrical diagrams of the connections



- BN brown
- BU blue
- BK black
- WH white
- PK pink
- GY gray

dimensions (mm)





FX series

Photoelectric sensors
for DIN-rail mounting



Photoelectric sensors
for DIN-rail mounting

features

- Fibre-optic amplifier for DIN-rail mounting (DIN/EN 50022)
- Distance setting by means of teach in with additional manual fine adjustment (FX4)
- Distance setting by means of 12-turn potentiometer with illuminated scale (FX3)
- Adjustable pulse delay and stretching (FX4)
- High switching frequency: 1,5 kHz
- Ideal for stacking, thanks to 10 mm housing width
- Teach 1 (background), Teach 2 (target and background) (FX4)
- Large setting range of 20...200 mm

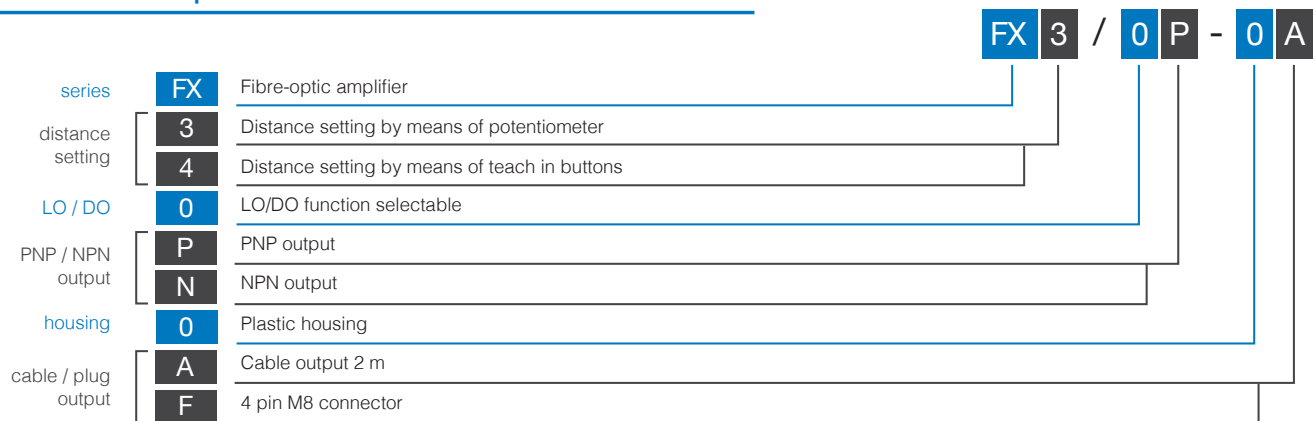
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code description



available models

dimensions (mm)	series	DIN rail	adjustment	exit	PNP		NPN	
					NO / NC		NO / NC	
10 x 31 x 60	FX3	●	trimmer	cable	FX3/0P-0A		FX3/0N-0A	
				M8	FX3/0P-0F		FX3/0N-0F	
	FX4		Teach-In	cable	FX4/0P-0A		FX4/0N-0A	
				M8	FX4/0P-0F		FX4/0N-0F	



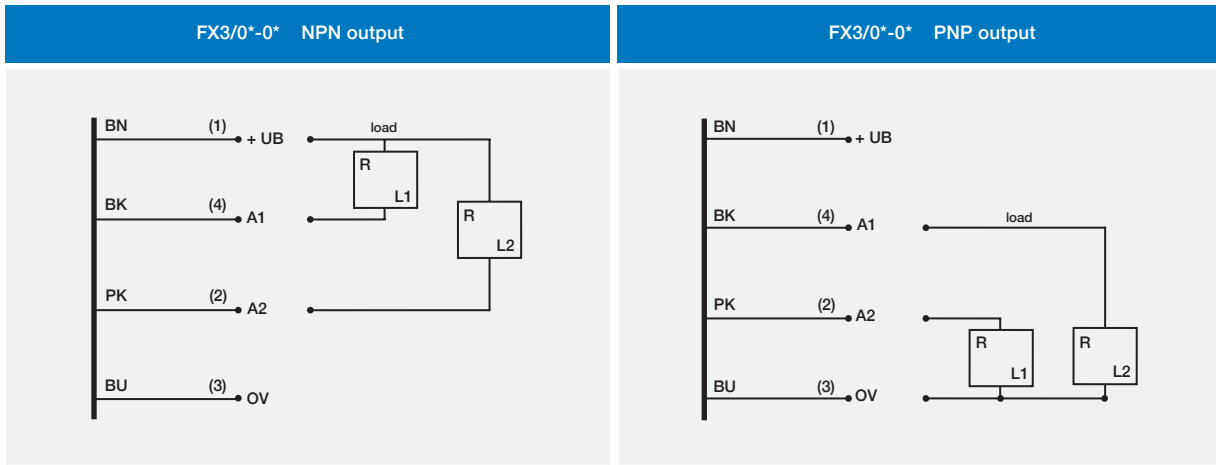
technical specification

Photoelectric sensors
for DIN-rail mounting

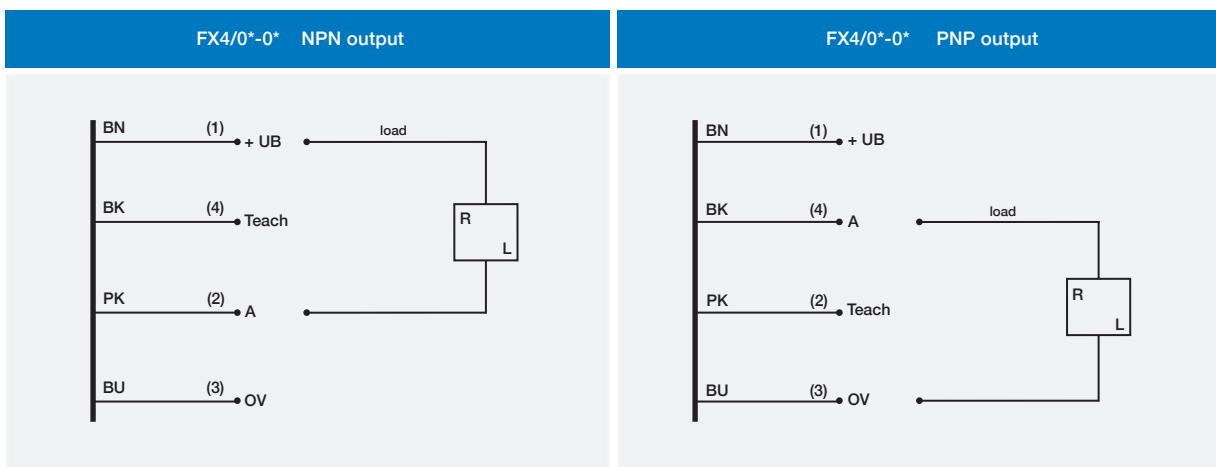
	FX4/0*-0*	FX3/0*-0*
nominal sensing distance	see optical fibres table	
setting range	20...200 mm	
teach increment	≤ 1 mm	-
hysteresis	10 % typ.	
standard target	100 x 100 mm white	
emitter (regulated light power)	red (660 nm)	
output (switchable)	NO / NC	
excess light output	-	light ON
output state indication	LEDs; bar graph	LED yellow
excess light indicator	LED green	
supply voltage range	10 ... 30 Vdc	
max. ripple content	≤ 20% V al / UB	
output current	≤ 200 mA	
output voltage drop	≤ 2.0 V a / at 200 mA	
no-load supply current	μ25 mA typ. a / at UB = 24 V	≤ 15 mA typ. a / at UB = 24 V
leakage current	≤ 0.1 mA	
switching frequency	≤ 1,500 Hz	
switching time	≤ 330 μsec	
modulation frequency	15 kHz	
power on delay	80 ms	300 ms
max. ambient light, halogen	5,000 Lux	
max. ambient light, sun	10,000 Lux	
sensitivity setting	Teach-In	Potentiometer
pulse delay/stretching	10 ... 150 msec	-
ambient temperature range	-25 ... +55 °C	
temperature drift of sn	0.2 % / °C	
voltage reversal protection	built-in	
induction protection	built-in	
short-circuit protection	built-in	
shocks and vibration	IEC 60947-5-2 / 7.4	
cable length	300 m max.	
weight	17 g connector / 68 g cable	18 g connector/ 69 g cable
protection degree	IP64 (EN60529) ⁽¹⁾	
EMC	in conformity with the EMC Directive according to EN 60947-5-2	
optical fibre connection	Ø 2,2 mm	
housing material	PBTP	
connection cable (FX*/0*-0A)	PVC 4 x 0,25 mm ² / 128 x 0,05 mm Ø	
connector type (FX*/0*-0F)	M8 4 wires	

⁽¹⁾ Protection guaranteed only with plug cable well mounted

electrical diagrams of the connections

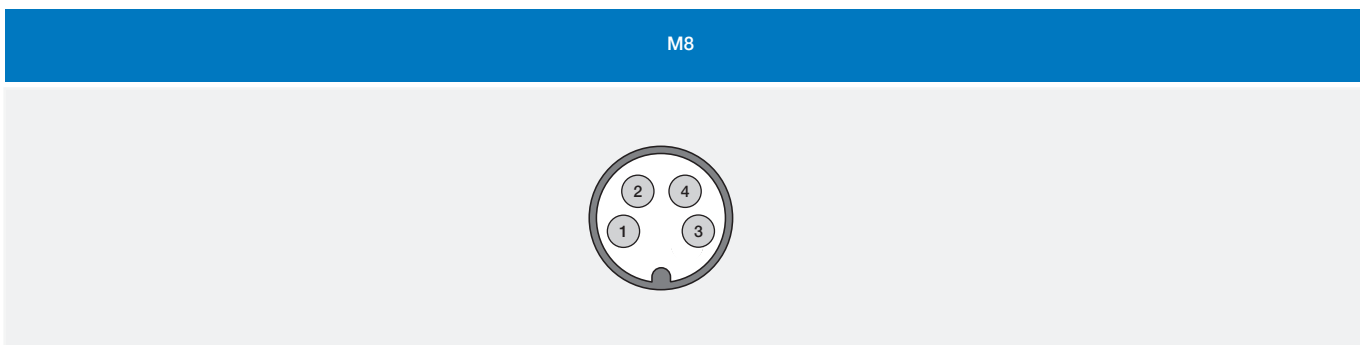


A1 Output (Light-ON/Dark-ON switchable)
A2 Excess light output Light-ON



BN brown
BU blue
BK black
WH white
PK pink
GY gray

plug

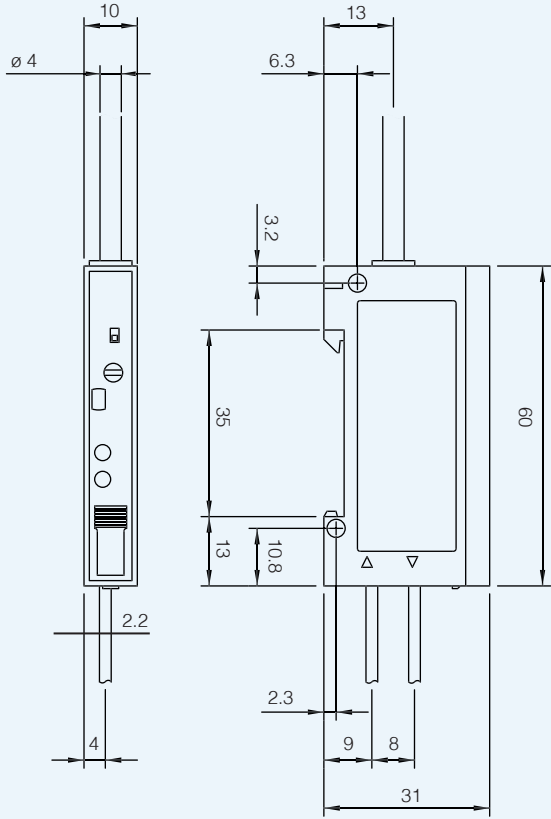




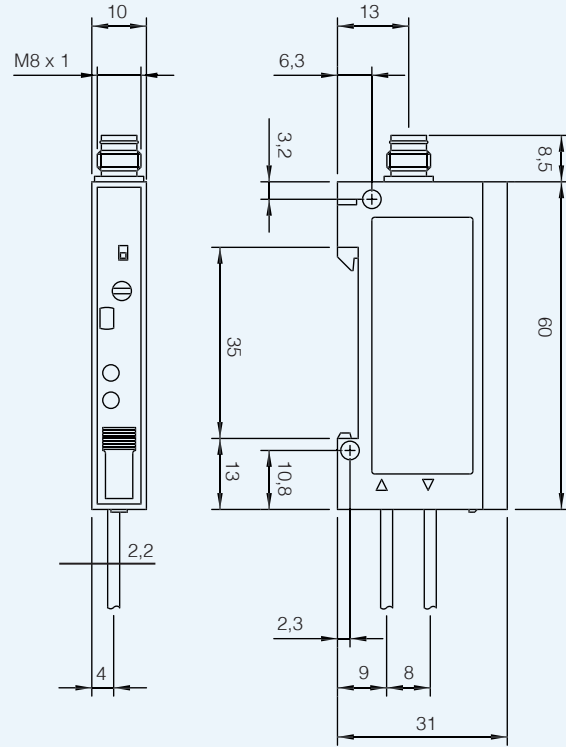
dimensions (mm)

Photoelectric sensors
for DIN-rail mounting

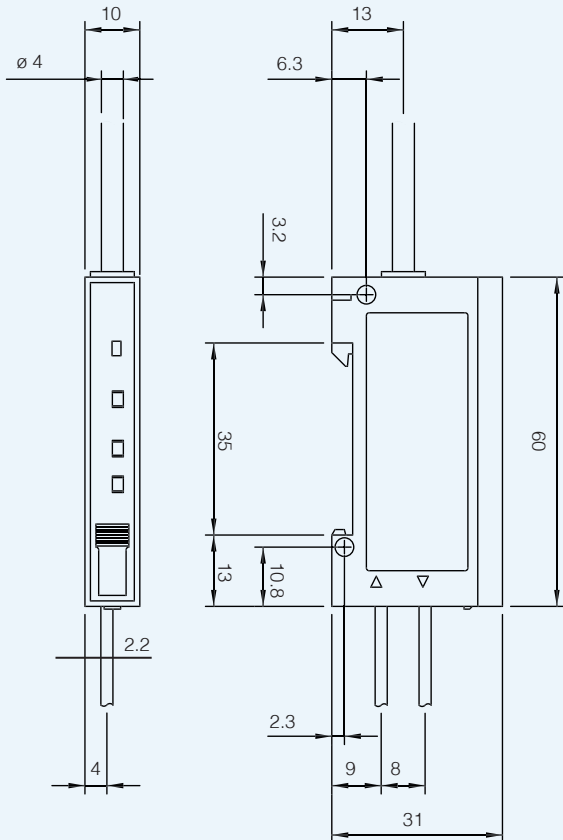
FX3/0*-0A



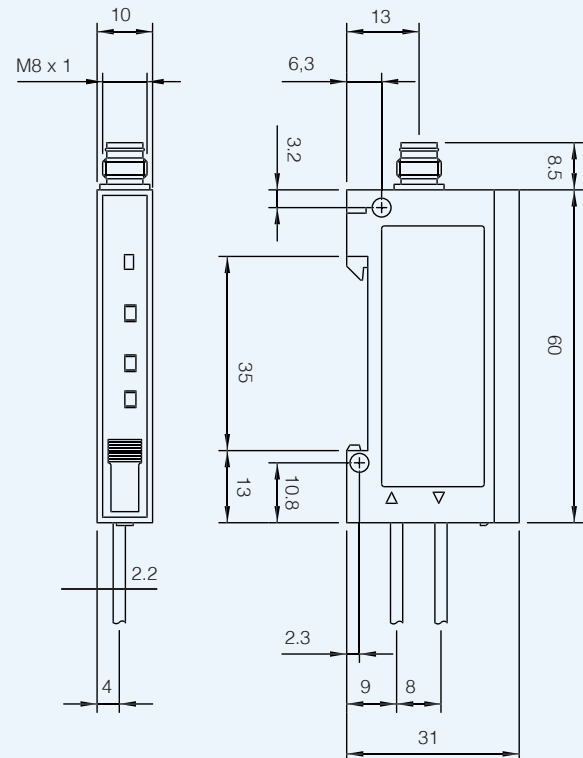
FX3/0*-0F



FX4/0*-0A



FX4/0*-0F



FX