



Baumer
Passion for Sensors

Inductive Sensors.

Compact, reliable and highly precise –
Indispensable in all machines.





Indispensable in all machines

Non-contacting, inductive proximity sensors play a major role in automation technology all over the world. For several decades millions of them have been used for monitoring the presence, movement and position of metal machine parts, valves, and gears.

Baumer offers a unique, high-performance portfolio of switching and measuring inductive sensors which work reliably even in the toughest industrial environments.

Inductive sensors from Baumer distinguish themselves through:

- Guaranteed reliability thanks to patented design and comprehensive final inspection of all sensors at the factory.
- Minimal temperature drift and excellent electromagnetic compatibility (EMC) for maximum process reliability
- Simple mounting thanks to compensation of the installation tolerances by means of teach
- Large measuring ranges and linear characteristic curves for precise measurement results



Learn more.
Downloadable data sheets as well as further information
about our products is available at:
www.baumer.com/inductive



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Inductive distance sensors *AlphaProx*®

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Quick reference list

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Standard solutions for factory automation – cylindrical designs

product family	IFRM 03	IFRM 03	IFRM 04	IFRM 04	IFRM 04	IFRM 05	IFRM 05
							
feature							
dimension	ø 3 mm	ø 3 mm	M4	ø 4 mm	ø 4 mm	M5	M5
nominal sensing distance Sn	0,8 mm	1 mm	0,8 mm	1 mm	1,6 mm	1 mm	1,6 mm
mounting type	flush	flush	flush	flush	flush	flush	flush
switching frequency max.	3 kHz	4 kHz	3 kHz	5 kHz	3 kHz	5 kHz	3 kHz
output current max.	100 mA	100 mA	100 mA	100 mA	100 mA	100 mA	100 mA
operating temperature	-25 ... +75 °C	-10 ... +70 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
housing length	12 ... 22 mm	12 ... 16 mm	22 mm	15 ... 45 mm	20 ... 45 mm	15 ... 45 mm	20 ... 45 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	cable flylead connector wires ext. electronic	cable wires	flylead connector wires	connector M5 connector M8 cable flylead connector wires	connector M5 connector M8 cable flylead connector	connector M5 connector M8 cable flylead connector wires	connector M5 connector M8 cable
page	30 ... 31	32	33	34 ... 37	38 ... 40	41 ... 44	45 ... 47

product family	IR12.P10S	IFRM 18	IFRM 18	IR18.P08S	IR18.P12S	IR18.P15S	IFRM 30
							
feature	<i>GammaProx</i>				<i>GammaProx</i>		
dimension	M12	M18	M18	M18	M18	M18	M30
nominal sensing distance Sn	10 mm	8 mm	12 mm	8 mm	12 mm	15 mm	10 mm
mounting type	non flush	quasi-flush	non flush	flush	flush	non flush	flush
switching frequency max.	1,5 kHz	500 Hz	500 Hz	500 Hz	400 Hz	400 Hz	500 Hz
output current max.	100 mA	200 mA	200 mA	200 mA	100 mA	100 mA	200 mA
operating temperature	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	0 ... +65 °C	-25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	brass-nickel	brass-nickel	brass-nickel	brass-nickel	brass-nickel	brass-nickel	brass-nickel
housing length	40 ... 60 mm	35 ... 75 mm	39 ... 53 mm	50 ... 60 mm	35 ... 60 mm	35 ... 60 mm	60 ... 65 mm
output circuit	PNP NPN	PNP NPN	PNP	PNP	PNP NPN	PNP NPN	PNP
output function	break (NC) make (NO)	break (NC) make (NO)	make (NO)	complemen- tary	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M12 cable	connector M8 connector M12 cable	connector M12 cable	connector M12 cable	connector M12 cable	connector M12 cable	connector M12 cable
page	69 ... 70	71 ... 74	75	76	77 ... 78	79 ... 80	81

IFRM 06	IR06.P03S	IR06.P06S	IFRM 08	IR08.P03S	IR08.P06S	IFRM 12	IR12.P04S	IR12.P06S
								
	GammaProx	GammaProx		GammaProx	GammaProx			GammaProx
ø 6,5 mm	ø 6,5 mm	ø 6,5 mm	M8	M8	M8	M12	M12	M12
2 mm	3 mm	6 mm	2 mm	3 mm	6 mm	4 mm	4 mm	6 mm
flush	flush	non flush	flush	flush	non flush	flush	flush	flush
5 kHz	2 kHz	400 Hz	5 kHz	2 kHz	400 Hz	2 kHz	2 kHz	1 kHz
200 mA	100 mA	100 mA	200 mA	100 mA	100 mA	200 mA	200 mA	100 mA
-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	brass-nickel	brass-nickel	brass-nickel
22 ... 56 mm	40 ... 46 mm	40 ... 46 mm	22 ... 56 mm	40 ... 46 mm	40 ... 46 mm	30 ... 60 mm	50 ... 85 mm	40 ... 60 mm
PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP	PNP NPN
break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	complemen- tary	break (NC) make (NO)
connector M8 cable flylead connector	connector M8 cable	connector M8 cable	connector M8 connector M12 cable flylead connector	connector M8 cable	connector M8 cable	connector M8 connector M12 cable	connector M12	connector M12 cable
48 ... 51	52	53	54 ... 58	59	60	61 ... 64	65 ... 66	67 ... 68

IFRM 30	IR30.P18S	IR30.P24S
		
	GammaProx	GammaProx
M30	M30	M30
15 mm	18 mm	24 mm
non flush	flush	non flush
500 Hz	500 Hz	500 Hz
200 mA	200 mA	200 mA
-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C
IP 67	IP 67	IP 67
brass-nickel	brass-nickel	brass-nickel
70 ... 75 mm	35 ... 60 mm	35 ... 60 mm
PNP	PNP NPN	PNP NPN
break (NC) make (NO)	complemen- tary	complemen- tary
connector M12 cable	connector M12 cable	connector M12 cable
82	83 ... 84	85 ... 86

Standard solutions for factory automation – cylindrical designs

product family	IFFM 04	IFFM 06	IFFM 08	IFFM 08	IFFM 08	IFFM 12	IFFM 20
							
dimension	4 x 4 mm	6 x 6 mm	8 x 4,7 mm	8 x 8 mm	8 x 8 mm	12 x 8 mm	20 x 10 mm
nominal sensing distance Sn	0,8 mm	1 mm	2 mm	2 mm	2 mm	4 mm	5 mm
switching frequency max.	3 kHz	5 kHz	5 kHz	5 kHz	5 kHz	2 kHz	1 kHz
output current max.	100 mA	100 mA	100 mA	200 mA	200 mA	200 mA	200 mA
operating temperature	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	brass-nickel	die-cast zinc	brass-nickel die-cast zinc	brass-nickel	brass-nickel	brass-nickel
housing length	22 mm	20 ... 30 mm	16 mm	20 ... 60 mm	49 mm	24 mm	32 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	cable	connector M5 cable	cable flylead connector	connector M8 cable	connector M8	connector M5	connector M8
page	87	88 ... 89	90	91 ... 93	94 ... 95	96	97

Factor 1 sensors

product family	IR06.P02F	IR08.P02F	IR12.P04F	IR18.P06F	IR18.P08F
					
dimension	ø 6,5 mm	M8	M12	M18	M18
nominal sensing distance Sn	2 mm	2 mm	4 mm	6 mm	8 mm
mounting type	flush	flush	flush	flush	quasi-flush
switching frequency max.	3 kHz	3 kHz	2 kHz	500 Hz	500 Hz
output current max.	200 mA	200 mA	200 mA	200 mA	200 mA
operating temperature	-25 ... +75 °C	-25 ... +75 °C	-10 ... +70 °C	-25 ... +75 °C	-25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	brass-nickel	brass-nickel	brass-nickel
housing length	40 ... 46 mm	40 ... 46 mm	40 ... 50 mm	50 ... 60 mm	50 ... 60 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M8 cable	connector M8 cable	connector M12 cable	connector M12 cable	connector M12 cable
page	100	101	102	103	104

IFFM 20

20 x 10 mm

8 mm

500 Hz

200 mA

-25 ... +75 °C

IP 67

brass-nickel

32 mm

PNP
NPNbreak (NC)
make (NO)

connector M8

98

Hygienic design

product family	IFBR 06	IFBR 11	IFBR 11	IFBR 17	IFBR 17
					
dimension	ø 6,5 mm	ø 11 mm	ø 11 mm	ø 17 mm	ø 17 mm
nominal sensing distance Sn	3 mm	4 mm	6 mm	8 mm	12 mm
mounting type	non flush	flush	non flush	quasi-flush	non flush
switching frequency max.	3 kHz	1 kHz	1 kHz	500 Hz	500 Hz
output current max.	200 mA	200 mA	200 mA	200 mA	200 mA
operating temperature	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C
protection class	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+
housing material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
housing length	55 mm	54 ... 60 mm	54 ... 60 mm	55 ... 60 mm	55 ... 60 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M12	connector M12 cable	connector M12 cable	connector M12 cable	connector M12 cable
approvals / certificates	FDA conform EHEDG Ecolab	FDA conform EHEDG Ecolab	FDA conform EHEDG Ecolab	FDA conform EHEDG Ecolab	FDA conform EHEDG Ecolab
page	105	106	107	108	109

Outdoor design

product family	IFRR 08	IR12.P04S	IFRR 12	IFRR 12	IFRM 12	IFRR 18	IFRM 18
							
dimension	M8	M12	M12	M12	M12	M18	M18
nominal sensing distance Sn	3 mm	4 mm	4 mm	6 mm	6 mm	8 mm	10 mm
mounting type	non flush	flush	flush	non flush	non flush	quasi-flush	flush
switching frequency max.	3 kHz	1 kHz	1 kHz	1 kHz	2 kHz	500 Hz	400 Hz
output current max.	200 mA	100 mA	200 mA	200 mA	200 mA	200 mA	200 mA
operating temperature	-40 ... +80 °C	-40 ... +75 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C
protection class	IP 68/69K & proTect+	IP 67	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 67	IP 68/69K & proTect+	IP 67
housing material	stainless steel	stainless steel	stainless steel	stainless steel	brass-nickel	stainless steel	brass-nickel
housing length	55 mm	50 mm	54 ... 60 mm	54 ... 60 mm	50 ... 60 mm	55 ... 60 mm	50 ... 60 mm
output circuit	PNP NPN	PNP	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M12	connector M12	connector M12 cable	connector M12 cable	connector M12	connector M12 cable	connector M12 cable
approvals / certificates		DNVGL					
page	115	116	117	118 ... 119	120	121	122

Washdown design

product family	IFRR 08	IFRR 12	IFRR 12	IFRR 18	IFRR 18
					
dimension	M8	M12	M12	M18	M18
nominal sensing distance Sn	3 mm	4 mm	6 mm	8 mm	12 mm
mounting type	non flush	flush	non flush	quasi-flush	non flush
switching frequency max.	3 kHz	1 kHz	1 kHz	500 Hz	500 Hz
output current max.	200 mA	200 mA	200 mA	200 mA	200 mA
operating temperature	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C
protection class	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+	IP 68/69K & proTect+
housing material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
housing length	55 mm	54 ... 60 mm	54 ... 60 mm	55 ... 60 mm	55 ... 60 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M12	connector M12 cable	connector M12 cable	connector M12 cable	connector M12 cable
approvals / certificates	Ecolab	Ecolab	Ecolab	Ecolab	Ecolab
page	110	111	112	113	114

IR18.P10S	IFRR 18	IFRM 18
		
M18	M18	M18
10 mm	12 mm	12 mm
flush	non flush	non flush
800 Hz	500 Hz	500 Hz
200 mA	200 mA	200 mA
-40 ... +75 °C	-40 ... +80 °C	-40 ... +80 °C
IP 67	IP 68/69K & proTect+	IP 67
brass-nickel	stainless steel	brass-nickel
60 mm	55 ... 60 mm	50 ... 60 mm
PNP	PNP NPN	PNP NPN
make (NO)	break (NC) make (NO)	break (NC) make (NO)
connector M12	connector M12 cable	connector M12 cable
DNVGL		
123	124 ... 125	126

Full metal housings *DuroProx*

product family	IFRD 06	IFRD 08	IFRD 12	IFRD 18
				
dimension	ø 6,5 mm	M8	M12	M18
nominal sensing distance Sn	2 mm	2 mm	4 mm	6 mm
mounting type	qausi-flush	qausi-flush	qausi-flush	qausi-flush
switching frequency max.	150 Hz	150 Hz	100 Hz	100 Hz
operating temperature	-25 ... +100 °C	-25 ... +100 °C	-25 ... +100 °C	-25 ... +100 °C
protection class	IP 67/68 IP 69K	IP 67/68 IP 69K	IP 67/68 IP 69K	IP 67/68 IP 69K
housing material	stainless steel	stainless steel	stainless steel	stainless steel
housing length	46 mm	46 mm	50 mm	60 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP NPN
output function	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	connector M8	connector M8	connector M12	connector M12
page	127	128	129	130

Immunity to welding and magnetic fields

product family	IFRW 12	IFRW 18
		
features	welding noise	welding noise
dimension	M12	M18
nominal sensing distance Sn	2 mm	5 mm
mounting type	flush	flush
switching frequency max.	1 kHz	500 Hz
Ausgangsstrom max.	250 mA	250 mA
operating temperature	-25 ... +75 °C	-25 ... +75 °C
protection class	IP 67	IP 67
housing material	brass	brass
housing length	50 mm	60 mm
output circuit	PNP	PNP
output function	break (NC)	break (NC)
connection types	connector M12	connector M12
page	137	137

High temperature

product family	IFRM 06	IFRM 08	IFRM 12	IFRH 08	IFRH 12	IFRH 18
						
dimension	ø 6,5 mm	M8	M12	M8	M12	M18
nominal sensing distance Sn	2 mm	2 mm	4 mm	1,5 mm	2 mm	5 mm
mounting type	flush	flush	flush	flush	flush	flush
switching frequency max.	5 kHz	5 kHz	2 kHz	2 kHz	2 kHz	1 kHz
output current max.	100 mA	100 mA	100 mA	200 mA	200 mA	200 mA
operating temperature	-25 ... +100 °C	-25 ... +100 °C	-25 ... +100 °C	-25 ... +180 °C	-25 ... +180 °C	-25 ... +180 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel	stainless steel
housing length	30 mm	30 mm	40 mm	30 mm	30 mm	71 mm
output circuit	PNP NPN	PNP NPN	PNP NPN	PNP	PNP	PNP
output function	break (NC)	break (NC) make (NO)	break (NC)	break (NC) make (NO)	break (NC) make (NO)	break (NC) make (NO)
connection types	cable	cable	cable	cable	cable	cable
features				inline amplifier	inline amplifier	inline amplifier
page	132	133 ... 134	134	135	136	136

High pressure

product family	IFRP 12	IFRP 16	IFRP 18
			
features	high pressure	high pressure	high pressure
dimension	M12	M16	M18
nominal sensing distance Sn	2 mm	2 mm	2 mm
mounting type	flush	flush	flush
switching frequency max.	5 kHz	3 kHz	3 kHz
Ausgangsstrom max.	200 mA	200 mA	200 mA
operating temperature	-25 ... +80 °C	-25 ... +80 °C	-25 ... +80 °C
protection class	IP 68	IP 68	IP 68
housing material	stainless steel	stainless steel	stainless steel
housing length	50 ... 70 mm	60 mm	60 mm
output circuit	PNP	PNP	PNP
output function	break (NC)	break (NC)	break (NC)
connection types	connector M12	connector M12	connector M12
page	138	139	139

ATEX / NAMUR

product family	IFR 04	IFR 05	IFRM 06X	IFRM 08X	IFRM 08X	IFRM 12X	IFRM 12X
							
dimension	ø 4 mm	M5	ø 6,5 mm	M8	M8	M12	M12
nominal sensing distance Sn	0,8 mm	0,8 mm	1,5 mm	1,5 mm	2 mm	2 mm	4 mm
mounting type	flush	flush	flush	flush	non flush	flush	non flush
switching frequency max.	5 kHz	5 kHz	5 kHz	5 kHz	5 kHz	2 kHz	2 kHz
operating temperature	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	brass	stainless steel	brass	brass	brass
housing length	25 mm	25 mm	25 mm	27 mm	27 mm	30 mm	40 mm
output circuit	NAMUR	NAMUR	NAMUR	NAMUR	NAMUR	NAMUR	NAMUR PNP NPN
connection types	cable	cable	cable	connector M8 cable	cable	cable	cable
features			ATEX 1G	ATEX 1G	ATEX 1G	ATEX 1G	ATEX 1G ATEX 3D
page	140	140	141	142	142	143	143 ... 145

IFRM 18X	IFRM 18X	IFF 08	IFFK 10E	IFR 10	IFR 10
					
M18	M18	8 x 8 mm	10 x 16 mm	Ø 10 mm	Ø 10 mm
5 mm	8 mm	1,5 mm	2 mm	2 mm	4 mm
flush	non flush	flush	non flush	flush	non flush
1 kHz	1 kHz	5 kHz	5 kHz	2 kHz	2 kHz
-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
brass	brass	brass	PBT	PBT	PBT
30 mm	38 mm	25 mm	27,8 mm	6,6 mm	6,6 mm
NAMUR	NAMUR	NAMUR	NAMUR	NAMUR	NAMUR
cable	cable	cable	cable	pins	pins
ATEX 1G	ATEX 1G			ATEX 3G	
146	146	147	148	149	150



Sn = 0,8 mm

- smallest sensor housing size
- fully contained electronics
- 16 mm long version with individual strands

general data

mounting type	flush
nominal sensing distance Sn	0,8 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	POM
housing material	stainless steel
dimension	3 mm

cable, 2 m

housing length	22 mm
----------------	-------

flylead connector M8

housing length	22 mm
----------------	-------

wires, 0,5 m

housing length	16 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

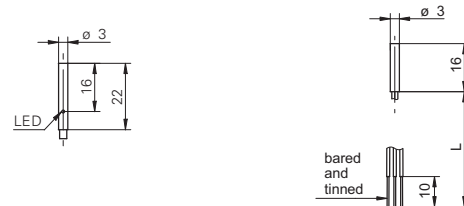
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

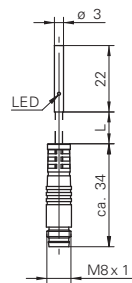
10137021	Clamping nut for sensors Ø 3 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings

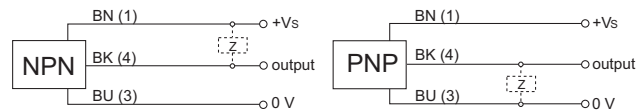


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

order reference	connection types	output circuit	output indicator
IFRM 03N1501/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 03N1501/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 03N1503/Q	wires, 0,5 m	NPN make function (NO)	-
IFRM 03N3501/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 03N3501/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 03N3503/Q	wires, 0,5 m	NPN break function (NC)	-
IFRM 03P1501/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 03P1501/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 03P1503/Q	wires, 0,5 m	PNP make function (NO)	-
IFRM 03P3501/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 03P3501/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 03P3503/Q	wires, 0,5 m	PNP break function (NC)	-



Sn = 0,8 mm

- sensing probe 12 mm long
- remote cable amplifier
- M8 x 1 quick disconnect



general data

mounting type	flush
nominal sensing distance Sn	0,8 mm
hysteresis	2 ... 20 % of Sr
output indicator	3 port LED red

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	POM
housing material	stainless steel
dimension	3 mm
housing length	12 mm
connection types	connector M8

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

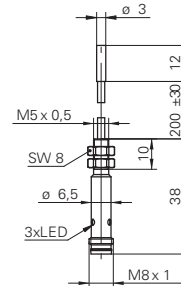
connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

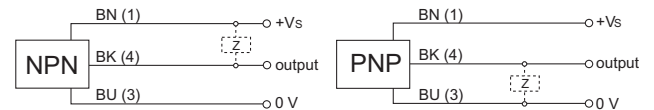
Accessories

10137021	Clamping nut for sensors Ø 3 mm
for details: see accessories section	

dimension drawing



connection diagrams



order reference

output circuit

IFRM 03N1505/CS35L	NPN make function (NO)
IFRM 03N3505/CS35L	NPN break function (NC)
IFRM 03P1505/CS35L	PNP make function (NO)
IFRM 03P3505/CS35L	PNP break function (NC)



Sn = 1 mm

- smallest sensor housing size
- fully contained electronics
- 12 mm long version with individual strands

general data

mounting type	flush
nominal sensing distance Sn	1 mm
temperature drift	- 5 % / + 10 % (+10 ... +60 °C) - 5 % / + 15 % (-10 ... +70 °C)
hysteresis	2 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 4 kHz
voltage supply range +Vs	6 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	POM
housing material	stainless steel
dimension	3 mm

cable, 2 m

housing length	16 mm
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wires, 0,5 m

housing length	12 mm
----------------	-------

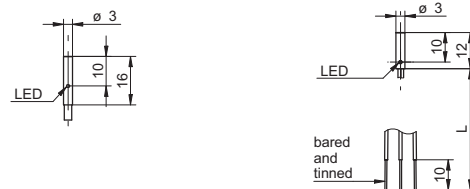
ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

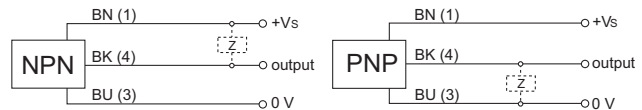
Accessories

10137021	Clamping nut for sensors Ø 3 mm
for details: see accessories section	

dimension drawings



connection diagrams



remarks

PUR cable

order reference	connection types	output circuit
IFRM 03N1713/L	cable, 2 m	NPN make function (NO)
IFRM 03N1713/QL	wires, 0,5 m	NPN make function (NO)
IFRM 03N3713/L	cable, 2 m	NPN break function (NC)
IFRM 03N3713/QL	wires, 0,5 m	NPN break function (NC)
IFRM 03P1713/L	cable, 2 m	PNP make function (NO)
IFRM 03P1713/QL	wires, 0,5 m	PNP make function (NO)
IFRM 03P3713/L	cable, 2 m	PNP break function (NC)
IFRM 03P3713/QL	wires, 0,5 m	PNP break function (NC)



Sn = 0,8 mm

- smallest diameter threaded housing sensor M4 x 0,5



general data

mounting type	flush
nominal sensing distance Sn	0,8 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	POM
housing material	stainless steel
dimension	4 mm
housing length	22 mm

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

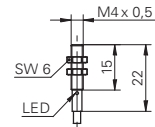
connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

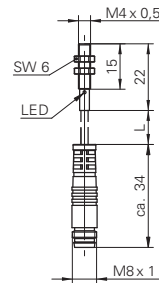
Accessories

11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawing

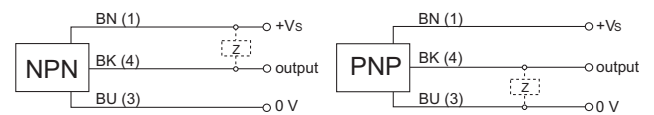


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

order reference	connection types	output circuit
IFRM 04N15B1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 04N15B1/L	cable, 2 m	NPN make function (NO)
IFRM 04N35B1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 04N35B1/L	cable, 2 m	NPN break function (NC)
IFRM 04P15B1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 04P15B1/L	cable, 2 m	PNP make function (NO)
IFRM 04P35B1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 04P35B1/L	cable, 2 m	PNP break function (NC)



Sn = 1 mm

- fully contained electronics
- 3 individual strands
- 15 mm housing length



general data

mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm
housing length	15 mm
connection types	wires, 0,5 m

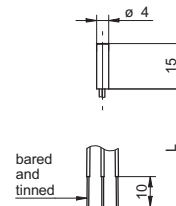
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

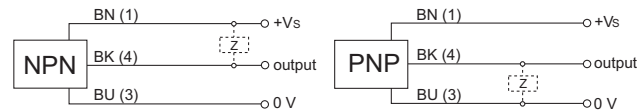
Accessories

10119345	Clamping nut for sensors Ø 4 mm
for details: see accessories section	

dimension drawing



connection diagrams



order reference

order reference	output circuit
IFRM 04N15A5/Q	NPN make function (NO)
IFRM 04N35A5/Q	NPN break function (NC)
IFRM 04P15A5/Q	PNP make function (NO)
IFRM 04P35A5/Q	PNP break function (NC)



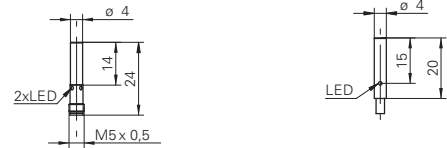
Sn = 1 mm

- fully contained electronics
- miniature connector M5 x 0,5
- high switching frequency

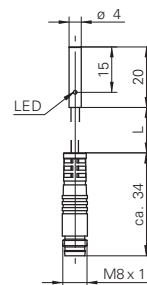
general data	
mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm
cable, 2 m	
housing length	20 mm
flylead connector M8	
housing length	20 mm
connector M5	
housing length	24 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

order reference	connection types	output circuit	output indicator
IFRM 04N15A3/KS35PL	flylead connector M8	NPN make function (NO)	LED red
IFRM 04N15A3/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 04N15A3/S05L	connector M5	NPN make function (NO)	2 port LED red
IFRM 04N35A3/KS35PL	flylead connector M8	NPN break function (NC)	LED red
IFRM 04N35A3/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 04N35A3/S05L	connector M5	NPN break function (NC)	2 port LED red
IFRM 04P15A3/KS35PL	flylead connector M8	PNP make function (NO)	LED red
IFRM 04P15A3/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 04P15A3/S05L	connector M5	PNP make function (NO)	2 port LED red
IFRM 04P35A3/KS35PL	flylead connector M8	PNP break function (NC)	LED red
IFRM 04P35A3/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 04P35A3/S05L	connector M5	PNP break function (NC)	2 port LED red

dimension drawings

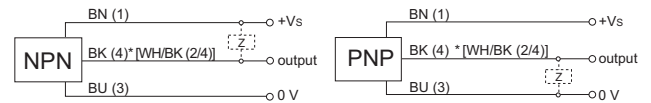


flylead connector version



standard cable length 200 mm (L)

connection diagrams



* .../S05L pin 2 & 4 electrically connected

remarks

PUR cable



Sn = 1 mm

- fully contained electronics
- standard cable version
- high switching frequency

general data

mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm
housing length	25 mm

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

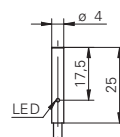
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

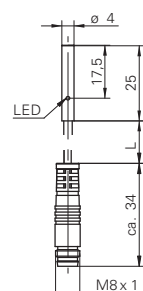
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawing

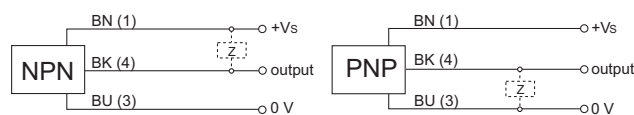


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

order reference	connection types	output circuit
IFRM 04N15A1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 04N15A1/L	cable, 2 m	NPN make function (NO)
IFRM 04N35A1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 04N35A1/L	cable, 2 m	NPN break function (NC)
IFRM 04P15A1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 04P15A1/L	cable, 2 m	PNP make function (NO)
IFRM 04P35A1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 04P35A1/L	cable, 2 m	PNP break function (NC)



Sn = 1 mm

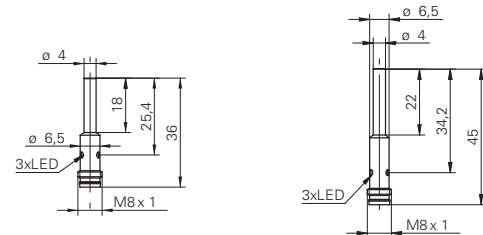
- robust steel housing
- M8 x 1 quick disconnect
- high switching frequency

general data	
mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	3 port LED red
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm
connection types	connector M8
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

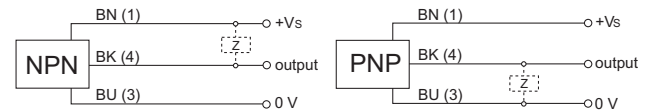
connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

order reference	output circuit	housing length
IFRM 04N15A3/S35L	NPN make function (NO)	36 mm
IFRM 04N35A3/S35L	NPN break function (NC)	36 mm
IFRM 04P15A1/S35L	PNP make function (NO)	45 mm
IFRM 04P15A3/S35L	PNP make function (NO)	36 mm
IFRM 04P35A1/S35L	PNP break function (NC)	45 mm
IFRM 04P35A3/S35L	PNP break function (NC)	36 mm

dimension drawings



connection diagrams




Sn = 1,6 mm

- fully contained electronics
- miniature connector M5 x 0,5
- increased sensing distance

general data

mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm

cable, 2 m

housing length	20 mm
----------------	-------

flylead connector M8

housing length	20 mm
----------------	-------

connector M5

housing length	24 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m

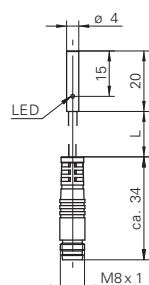
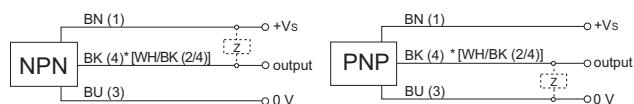
additional cable connectors and field wireable connectors: see accessories

Accessories

10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings

flylead connector version

connection diagrams


* .../S05L pin 2 & 4 electrically connected

remarks

PUR cable

order reference	connection types	output circuit	output indicator
IFRM 04N17A3/KS35PL	flylead connector M8	NPN make function (NO)	LED red
IFRM 04N17A3/PL	cable, 2 m	NPN make function (NO)	LED red
IFRM 04N17A3/S05L	connector M5	NPN make function (NO)	2 port LED red
IFRM 04N37A3/KS35PL	flylead connector M8	NPN break function (NC)	LED red
IFRM 04N37A3/PL	cable, 2 m	NPN break function (NC)	LED red
IFRM 04N37A3/S05L	connector M5	NPN break function (NC)	2 port LED red
IFRM 04P17A3/KS35PL	flylead connector M8	PNP make function (NO)	LED red
IFRM 04P17A3/PL	cable, 2 m	PNP make function (NO)	LED red
IFRM 04P17A3/S05L	connector M5	PNP make function (NO)	2 port LED red
IFRM 04P37A3/KS35PL	flylead connector M8	PNP break function (NC)	LED red
IFRM 04P37A3/PL	cable, 2 m	PNP break function (NC)	LED red
IFRM 04P37A3/S05L	connector M5	PNP break function (NC)	2 port LED red



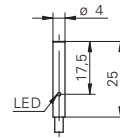
Sn = 1,6 mm

- fully contained electronics
- standard cable version
- increased sensing distance

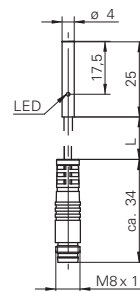
general data	
mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red
electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm
housing length	25 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors	
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	
Accessories	
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawing

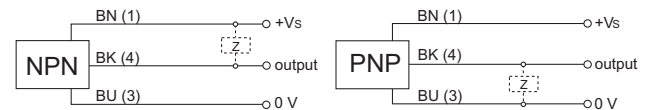


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

order reference	connection types	output circuit
IFRM 04N17A1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 04N17A1/PL	cable, 2 m	NPN make function (NO)
IFRM 04N37A1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 04N37A1/PL	cable, 2 m	NPN break function (NC)
IFRM 04P17A1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 04P17A1/PL	cable, 2 m	PNP make function (NO)
IFRM 04P37A1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 04P37A1/PL	cable, 2 m	PNP break function (NC)



Sn = 1,6 mm

- robust steel housing
- M8 x 1 quick disconnect
- increased sensing distance

general data

mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr
output indicator	3 port LED red

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel
dimension	4 mm
connection types	connector M8

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

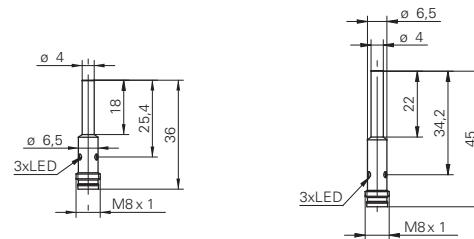
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

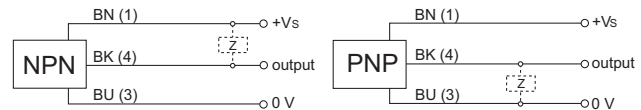
10119345	Clamping nut for sensors Ø 4 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings



connection diagrams



order reference	output circuit	housing length
IFRM 04N17A1/S35L	NPN make function (NO)	45 mm
IFRM 04N17A3/S35L	NPN make function (NO)	36 mm
IFRM 04N37A1/S35L	NPN break function (NC)	45 mm
IFRM 04N37A3/S35L	NPN break function (NC)	36 mm
IFRM 04P17A1/S35L	PNP make function (NO)	45 mm
IFRM 04P17A3/S35L	PNP make function (NO)	36 mm
IFRM 04P37A1/S35L	PNP break function (NC)	45 mm
IFRM 04P37A3/S35L	PNP break function (NC)	36 mm



Sn = 1 mm

- fully contained electronics
- 3 individual strands
- 15 mm housing length

general data

mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm
housing length	15 mm
connection types	wires, 0,5 m

ambient conditions

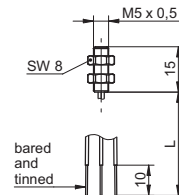
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference

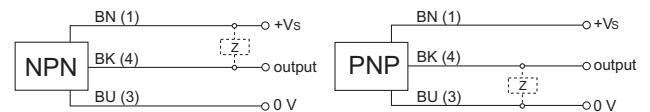
output circuit

IFRM 05N15A5/Q	NPN make function (NO)
IFRM 05N35A5/Q	NPN break function (NC)
IFRM 05P15A5/Q	PNP make function (NO)
IFRM 05P35A5/Q	PNP break function (NC)

dimension drawing



connection diagrams





Sn = 1 mm

- fully contained electronics
- miniature connector M5 x 0,5
- integrated LED-status display

general data

mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm

cable, 2 m

housing length	20 mm
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flylead connector M8

housing length	20 mm
----------------	-------

connector M5

housing length	24 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m

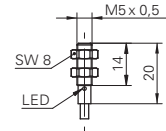
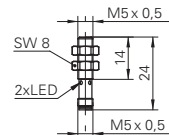
additional cable connectors and field wireable connectors: see accessories

Accessories

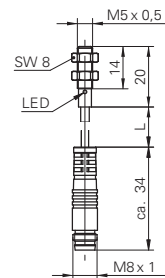
11163236	Adapter for pulse stretching M8
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for details: see accessories section

dimension drawings

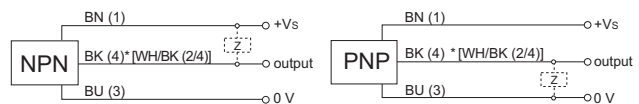


flylead connector version



standard cable length 200 mm (L)

connection diagrams



* .../S05L pin 2 & 4 electrically connected

remarks

PUR cable

order reference	connection types	output circuit	output indicator
IFRM 05N15A3/KS35PL	flylead connector M8	NPN make function (NO)	LED red
IFRM 05N15A3/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 05N15A3/S05L	connector M5	NPN make function (NO)	2 port LED red
IFRM 05N35A3/KS35PL	flylead connector M8	NPN break function (NC)	LED red
IFRM 05N35A3/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 05N35A3/S05L	connector M5	NPN break function (NC)	2 port LED red
IFRM 05P15A3/KS35PL	flylead connector M8	PNP make function (NO)	LED red
IFRM 05P15A3/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 05P15A3/S05L	connector M5	PNP make function (NO)	2 port LED red
IFRM 05P35A3/KS35PL	flylead connector M8	PNP break function (NC)	LED red
IFRM 05P35A3/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 05P35A3/S05L	connector M5	PNP break function (NC)	2 port LED red



Sn = 1 mm

- fully contained electronics
- standard cable version
- integrated LED-status display

general data

mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm
housing length	25 mm

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

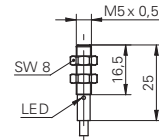
connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

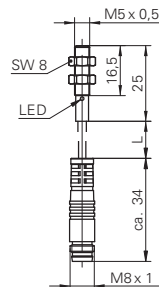
Accessories

11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawing

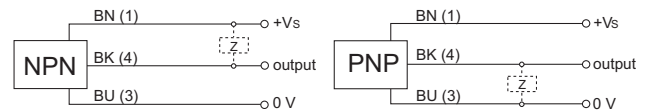


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable

order reference	connection types	output circuit
IFRM 05N15A1/KS35PL	flylead connector M8	NPN make function (NO)
IFRM 05N15A1/L	cable, 2 m	NPN make function (NO)
IFRM 05N35A1/KS35PL	flylead connector M8	NPN break function (NC)
IFRM 05N35A1/L	cable, 2 m	NPN break function (NC)
IFRM 05P15A1/KS35PL	flylead connector M8	PNP make function (NO)
IFRM 05P15A1/L	cable, 2 m	PNP make function (NO)
IFRM 05P35A1/KS35PL	flylead connector M8	PNP break function (NC)
IFRM 05P35A1/L	cable, 2 m	PNP break function (NC)


Sn = 1 mm

- robust steel housing
- M8 x 1 quick disconnect
- 3 port LED

general data

mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	3 port LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm
connection types	connector M8

ambient conditions

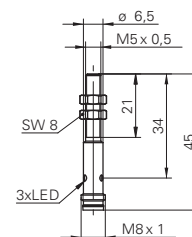
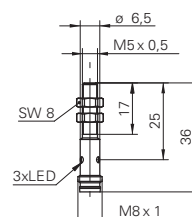
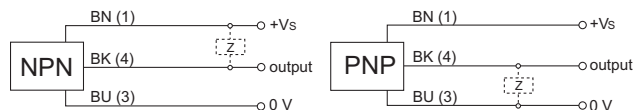
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings

connection diagrams


order reference	output circuit	housing length
IFRM 05N15A3/S35L	NPN make function (NO)	36 mm
IFRM 05N35A3/S35L	NPN break function (NC)	36 mm
IFRM 05P15A1/S35L	PNP make function (NO)	45 mm
IFRM 05P15A3/S35L	PNP make function (NO)	36 mm
IFRM 05P35A1/S35L	PNP break function (NC)	45 mm
IFRM 05P35A3/S35L	PNP break function (NC)	36 mm



Sn = 1,6 mm

- fully contained electronics
- miniature connector M5 x 0,5
- increased sensing distance

general data

mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm

cable, 2 m

housing length	20 mm
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connector M5

housing length	24 mm
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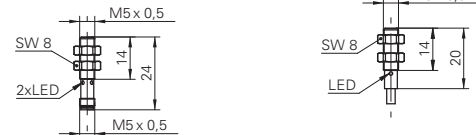
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

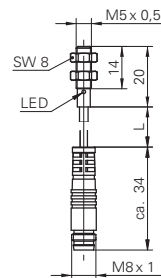
connectors and mating connectors

ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

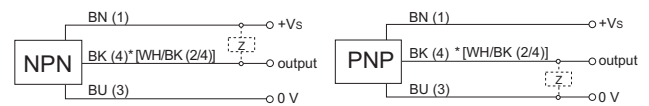
dimension drawings



flylead connector version



connection diagrams



* .../S05L pin 2 & 4 electrically connected

remarks

PUR cable

order reference	connection types	output circuit	output indicator
IFRM 05N17A3/PL	cable, 2 m	NPN make function (NO)	LED red
IFRM 05N17A3/S05L	connector M5	NPN make function (NO)	2 port LED red
IFRM 05N37A3/PL	cable, 2 m	NPN break function (NC)	LED red
IFRM 05N37A3/S05L	connector M5	NPN break function (NC)	2 port LED red
IFRM 05P17A3/PL	cable, 2 m	PNP make function (NO)	LED red
IFRM 05P17A3/S05L	connector M5	PNP make function (NO)	2 port LED red
IFRM 05P37A3/PL	cable, 2 m	PNP break function (NC)	LED red
IFRM 05P37A3/S05L	connector M5	PNP break function (NC)	2 port LED red



Sn = 1,6 mm

- fully contained electronics
- standard cable version
- increased sensing distance

general data

mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm
housing length	25 mm
connection types	cable, 2 m

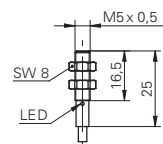
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

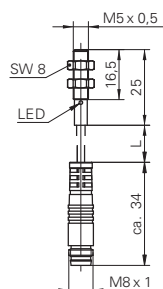
order reference

order reference	output circuit
IFRM 05N17A1/PL	NPN make function (NO)
IFRM 05N37A1/PL	NPN break function (NC)
IFRM 05P17A1/PL	PNP make function (NO)
IFRM 05P37A1/PL	PNP break function (NC)

dimension drawing

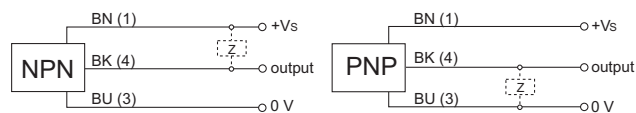


flylead connector version



standard cable length 200 mm (L)

connection diagrams



remarks

PUR cable



Sn = 1,6 mm

- robust steel housing
- M8 x 1 quick disconnect
- increased sensing distance

general data

mounting type	flush
nominal sensing distance Sn	1,6 mm
hysteresis	2 ... 20 % of Sr
output indicator	3 port LED red

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	5 mm
connection types	connector M8

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

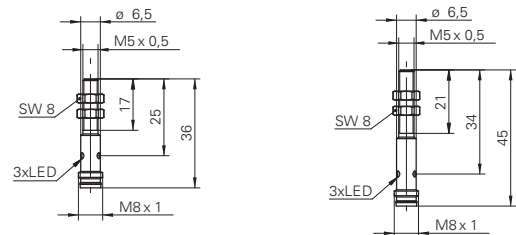
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

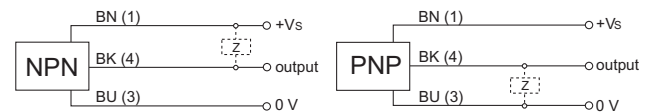
11163236	Adapter for pulse stretching M8
for details: see accessories section	

order reference	output circuit	housing length
IFRM 05N17A1/S35L	NPN make function (NO)	45 mm
IFRM 05N17A3/S35L	NPN make function (NO)	36 mm
IFRM 05N37A1/S35L	NPN break function (NC)	45 mm
IFRM 05N37A3/S35L	NPN break function (NC)	36 mm
IFRM 05P17A1/S35L	PNP make function (NO)	45 mm
IFRM 05P17A3/S35L	PNP make function (NO)	36 mm
IFRM 05P37A1/S35L	PNP break function (NC)	45 mm
IFRM 05P37A3/S35L	PNP break function (NC)	36 mm

dimension drawings



connection diagrams




Sn = 2 mm

- robust steel housing
- shortest version with M8 x 1 connector
- high switching frequency

general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm

cable, 2 m

housing length	22 mm
----------------	-------

flylead connector M8

housing length	22 mm
----------------	-------

connector M8

housing length	28 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

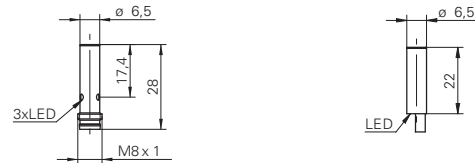
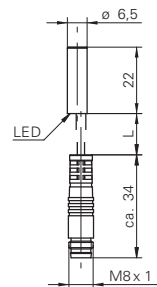
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

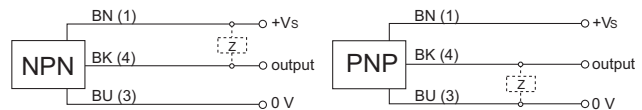
Accessories

10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings

flylead connector version


standard cable length 200 mm (L)

connection diagrams


order reference	connection types	output circuit	output indicator
IFRM 06N1713/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 06N1713/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 06N17A5/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N3713/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 06N3713/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 06N37A5/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P1713/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 06P1713/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 06P17A5/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 06P3713/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 06P3713/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 06P37A5/S35L	connector M8	PNP break function (NC)	3 port LED red

**Sn = 2 mm**

- robust steel housing
- high switching frequency
- mounting with special support

general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm

cable, 2 m

housing length	30 mm
----------------	-------

flylead connector M8

housing length	30 mm
----------------	-------

connector M8

housing length	36 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

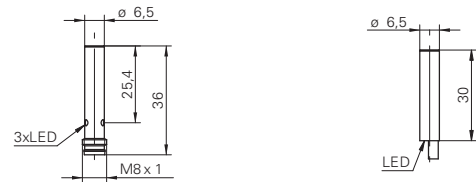
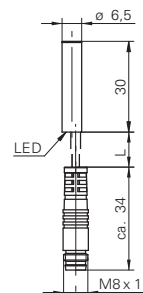
connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

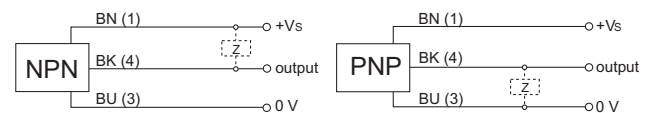
Accessories

10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings**flylead connector version**

standard cable length 200 mm (L)

connection diagrams

order reference	connection types	output circuit	output indicator
IFRM 06N1701/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 06N1701/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 06N17A3/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N3701/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 06N3701/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 06N37A3/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P1701/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 06P1701/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 06P17A3/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 06P3701/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 06P3701/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 06P37A3/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

- robust steel housing
- high switching frequency
- mounting with special support

general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm

cable, 2 m

housing length	40 mm
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flylead connector M8

housing length	40 mm
----------------	-------

connector M8

housing length	46 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m

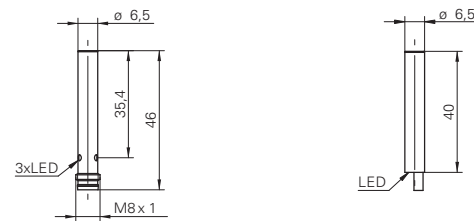
additional cable connectors and field wireable connectors: see accessories

Accessories

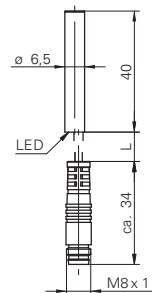
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings

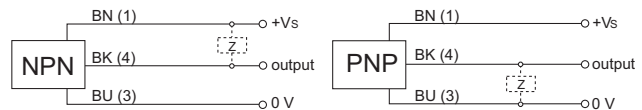


flylead connector version



standard cable length 200 mm (L)

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 06N17A1/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 06N17A1/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 06N17A1/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N37A1/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 06N37A1/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 06N37A1/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P17A1/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 06P17A1/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 06P17A1/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 06P37A1/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 06P37A1/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 06P37A1/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

- long, robust steel housings
- cable and connector versions
- mounting with special support

general data	
mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
electrical data	
switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm
cable, 2 m	
housing length	50 mm
flylead connector M8	
housing length	50 mm
connector M8	
housing length	56 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

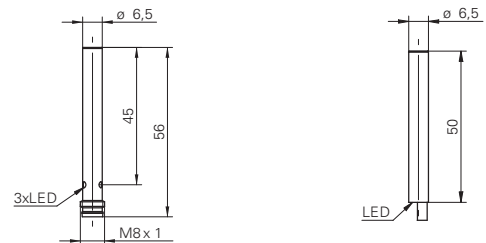
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

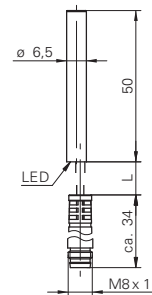
10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings

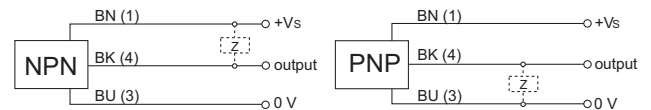


flylead connector version



standard cable length 200 mm (L)

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 06N17A4/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 06N17A4/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 06N37A4/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 06N37A4/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 06P17A4/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 06P17A4/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 06P17A4/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 06P37A4/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 06P37A4/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 06P37A4/S35L	connector M8	PNP break function (NC)	3 port LED red


Sn = 3 mm

- version with extended Sn *GammaProx*
- shielded mounting
- robust steel housing

general data

mounting type	flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	3 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 65 %, aluminum 30 %

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm

cable, 2 m

housing length	40 mm
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connector M8

housing length	46 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

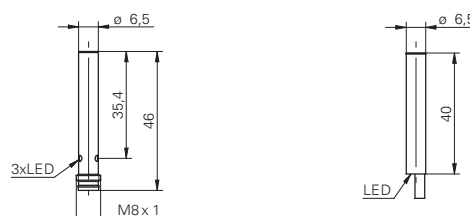
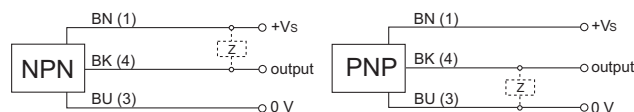
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings

connection diagrams

correction factors for different mounting situations (approx.)





Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminium	100 %

Mounting material	Correction factor
Mild steel	85 %
Stainless steel	65 %
Aluminium	55 %

Mounting material	Correction factor
Mild steel	90 %
Stainless steel	60 %
Aluminium	45 %

remarks

for correct installation refer to "mounting instructions"

order reference	connection types	output circuit	output indicator
IR06.P03S-11148708	cable, 2 m	NPN break function (NC)	LED red
IR06.P03S-11148685	cable, 2 m	NPN make function (NO)	LED red
IR06.P03S-11148739	cable, 2 m	PNP break function (NC)	LED red
IR06.P03S-11148719	cable, 2 m	PNP make function (NO)	LED red
IR06.P03S-11148711	connector M8	NPN break function (NC)	3 port LED red
IR06.P03S-11148689	connector M8	NPN make function (NO)	3 port LED red
IR06.P03S-11148740	connector M8	PNP break function (NC)	3 port LED red
IR06.P03S-11148736	connector M8	PNP make function (NO)	3 port LED red

**Sn = 6 mm**

- version with extended Sn *GammaProx*
- non shielded mounting
- robust steel housing

general data

mounting type	non-flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	6 mm
temperature drift	± 10 % (0 ... +60 °C) ± 15 % (-25 ... +75 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 80 %, aluminum 50 %

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm

cable, 2 m

housing length	40 mm
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connector M8

housing length	46 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 32SH0200 Connector M8, 3 pin, straight, 2 m

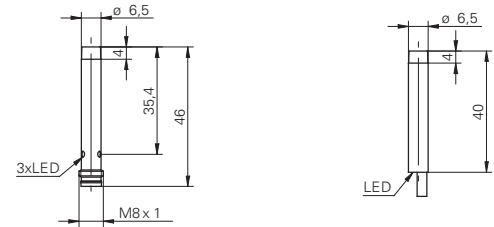
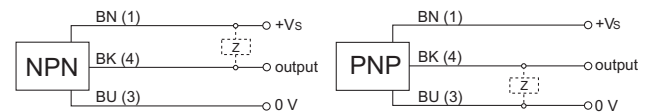
ESW 31SH0200 Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings**connection diagrams****correction factors for different mounting situations (approx.)**

Mounting material	Correction factor	Mounting material	Correction factor	Mounting material	Correction factor
Mild steel	100 %	Mild steel	110 %	Mild steel	not possible
Stainless steel	100 %	Stainless steel	95 %	Stainless steel	95 %
Aluminum	100 %	Aluminum	90 %	Aluminum	80 %

order reference	connection types	output circuit	output indicator
IR06.P06S-11148702	cable, 2 m	NPN break function (NC)	LED red
IR06.P06S-11148683	cable, 2 m	NPN make function (NO)	LED red
IR06.P06S-11148737	cable, 2 m	PNP break function (NC)	LED red
IR06.P06S-11148714	cable, 2 m	PNP make function (NO)	LED red
IR06.P06S-11148705	connector M8	NPN break function (NC)	3 port LED red
IR06.P06S-11148684	connector M8	NPN make function (NO)	3 port LED red
IR06.P06S-11148738	connector M8	PNP break function (NC)	3 port LED red
IR06.P06S-11148717	connector M8	PNP make function (NO)	3 port LED red


Sn = 2 mm

- shortest version with M8 x 1 connector
- high switching frequency
- robust steel housing

general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm

cable, 2 m

housing length	22 mm
----------------	-------

flylead connector M8

housing length	22 mm
----------------	-------

connector M8

housing length	28 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

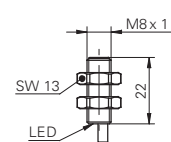
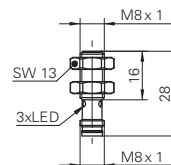
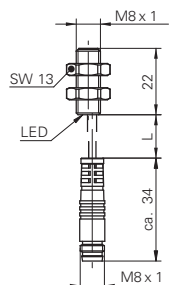
connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

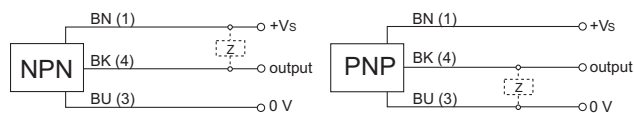
Accessories

10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings

flylead connector version


standard cable length 200 mm (L)

connection diagrams


order reference	connection types	output circuit	output indicator
IFRM 08N1713/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 08N1713/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 08N17A5/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 08N3713/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 08N3713/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 08N37A5/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 08P1713/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 08P1713/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 08P17A5/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 08P3713/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 08P3713/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 08P37A5/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

- robust steel housing
- high switching frequency



general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm

cable, 2 m

housing length	30 mm
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flylead connector M8

housing length	30 mm
----------------	-------

connector M8

housing length	36 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

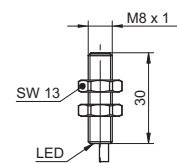
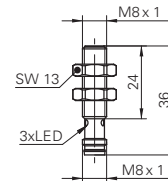
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

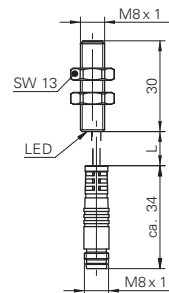
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings

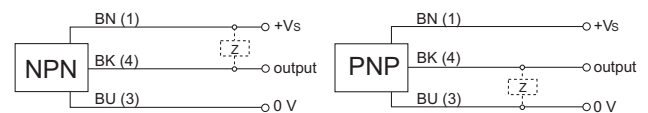


flylead connector version



standard cable length 200 mm (L)

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 08N1701/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 08N1701/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 08N17A3/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 08N3701/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 08N3701/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 08N37A3/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 08P1701/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 08P1701/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 08P17A3/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 08P3701/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 08P3701/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 08P37A3/S35L	connector M8	PNP break function (NC)	3 port LED red


Sn = 2 mm

- robust steel housing
- high switching frequency

general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm

cable, 2 m

housing length	40 mm
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flylead connector M8

housing length	40 mm
----------------	-------

connector M8

housing length	46 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

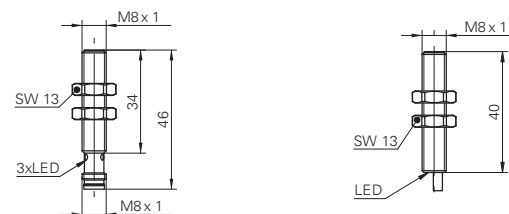
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

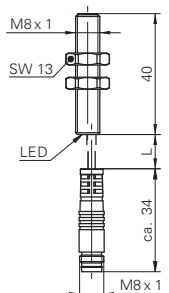
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings

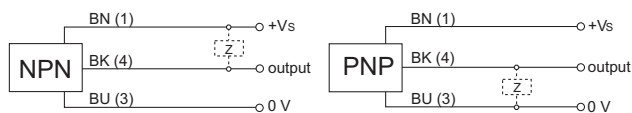


flylead connector version



standard cable length 200 mm (L)

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 08N17A1/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 08N17A1/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 08N17A1/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 08N37A1/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 08N37A1/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 08N37A1/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 08P17A1/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 08P17A1/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 08P17A1/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 08P37A1/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 08P37A1/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 08P37A1/S35L	connector M8	PNP break function (NC)	3 port LED red



Sn = 2 mm

- robust steel housing
- high switching frequency

general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm

cable, 2 m

housing length	50 mm
----------------	-------

flylead connector M8

housing length	50 mm
----------------	-------

connector M8

housing length	56 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

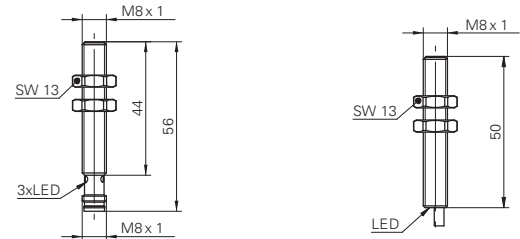
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

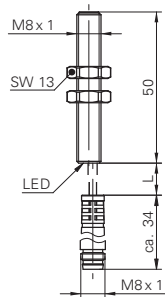
10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings

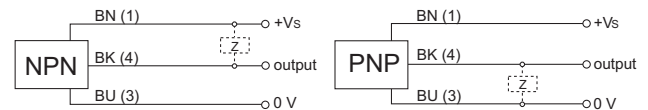


flylead connector version



standard cable length 200 mm (L)

connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 08N17A4/KS35L	flylead connector M8	NPN make function (NO)	LED red
IFRM 08N17A4/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 08N17A4/S35L	connector M8	NPN make function (NO)	3 port LED red
IFRM 08N37A4/KS35L	flylead connector M8	NPN break function (NC)	LED red
IFRM 08N37A4/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 08N37A4/S35L	connector M8	NPN break function (NC)	3 port LED red
IFRM 08P17A4/KS35L	flylead connector M8	PNP make function (NO)	LED red
IFRM 08P17A4/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 08P17A4/S35L	connector M8	PNP make function (NO)	3 port LED red
IFRM 08P37A4/KS35L	flylead connector M8	PNP break function (NC)	LED red
IFRM 08P37A4/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 08P37A4/S35L	connector M8	PNP break function (NC)	3 port LED red

**Sn = 2 mm**

- robust steel housing
- high switching frequency
- M12 x 1 quick disconnect

**general data**

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
output indicator	3 port LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
housing length	50 mm
connection types	connector M12

ambient conditions

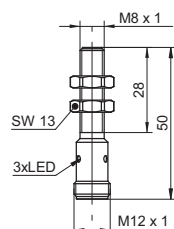
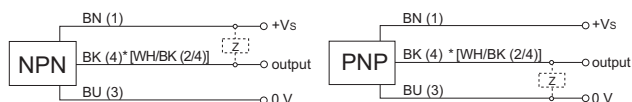
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

10151719	Sensofix series 08 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

dimension drawing**connection diagrams**

* .../S14L pin 2 & 4 electrically connected

order reference**output circuit**

IFRM 08N1703/S14L	NPN make function (NO)
IFRM 08N3703/S14L	NPN break function (NC)
IFRM 08P1703/S14L	PNP make function (NO)
IFRM 08P3703/S14L	PNP break function (NC)

**Sn = 3 mm**

- version with extended Sn *GammaProx*
- shielded mounting
- robust steel housing

general data

mounting type	flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	3 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 65 %, aluminum 30 %

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
tightening torque max.	10 Nm (A: 7 Nm)

cable, 2 m

housing length	40 mm
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connector M8

housing length	46 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

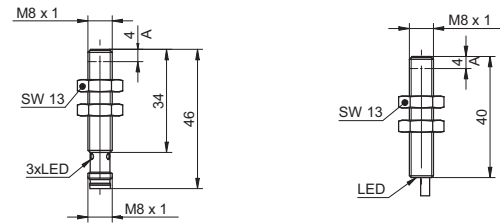
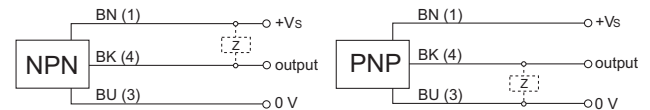
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings**connection diagrams****correction factors for different mounting situations (approx.)**

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	90 %
Aluminum	85 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	80 %
Aluminum	70 %

remarks

for correct installation refer to "mounting instructions"

order reference	connection types	output circuit	output indicator
IR08.P03S-11148764	cable, 2 m	NPN break function (NC)	LED red
IR08.P03S-11148749	cable, 2 m	NPN make function (NO)	LED red
IR08.P03S-11148790	cable, 2 m	PNP break function (NC)	LED red
IR08.P03S-11148775	cable, 2 m	PNP make function (NO)	LED red
IR08.P03S-11148766	connector M8	NPN break function (NC)	3 port LED red
IR08.P03S-11148760	connector M8	NPN make function (NO)	3 port LED red
IR08.P03S-11148791	connector M8	PNP break function (NC)	3 port LED red
IR08.P03S-11148757	connector M8	PNP make function (NO)	3 port LED red

**Sn = 6 mm**

- version with extended Sn *GammaProx*
- shielded mounting
- robust steel housing

general data

mounting type	non-flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	6 mm
temperature drift	± 10 % (0 ... +60 °C) ± 15 % (-25 ... +75 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 80 %, aluminum 50 %

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
tightening torque max.	10 Nm (A: 7 Nm)

cable, 2 m

housing length	40 mm
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connector M8

housing length	46 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

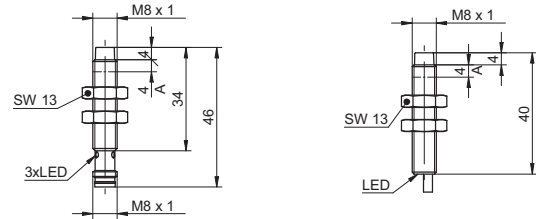
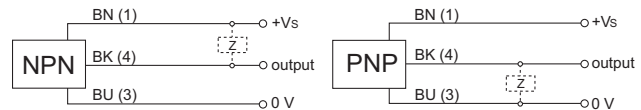
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawings**connection diagrams****correction factors for different mounting situations (approx.)**

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	110 %
Stainless steel	95 %
Aluminum	90 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	95 %
Aluminum	80 %

order reference	connection types	output circuit	output indicator
IR08.P06S-11148761	cable, 2 m	NPN break function (NC)	LED red
IR08.P06S-11148741	cable, 2 m	NPN make function (NO)	LED red
IR08.P06S-11148758	cable, 2 m	PNP break function (NC)	LED red
IR08.P06S-11148768	cable, 2 m	PNP make function (NO)	LED red
IR08.P06S-11148763	connector M8	NPN break function (NC)	3 port LED red
IR08.P06S-11148744	connector M8	NPN make function (NO)	3 port LED red
IR08.P06S-11148759	connector M8	PNP break function (NC)	3 port LED red
IR08.P06S-11148770	connector M8	PNP make function (NO)	3 port LED red



Sn = 4 mm

- shortest version with M12 x 1 connector
- high stability across entire temperature range



general data

mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm

cable, 2 m

housing length	30,4 mm
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connector M12

housing length	40,4 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

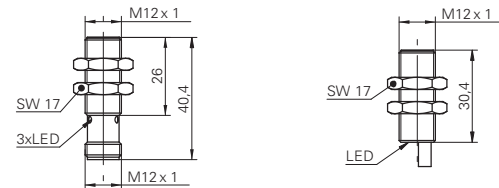
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

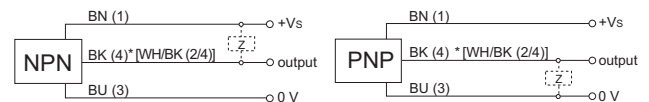
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFRM 12N1701/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 12N1703/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N3701/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 12N3703/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12P1701/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 12P1703/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P3701/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 12P3703/S14L	connector M12	PNP break function (NC)	3 port LED red


Sn = 4 mm

- high stability across entire temperature range



general data

mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm

cable, 2 m

housing length	40 mm
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connector M12

housing length	50 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

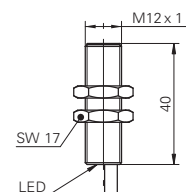
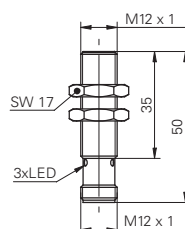
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

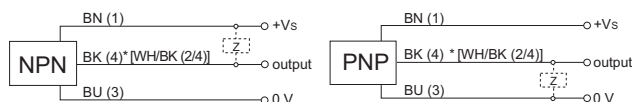
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

order reference	connection types	output circuit	output indicator
IFRM 12N1701/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N1702/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 12N3701/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12N3702/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 12P1701/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P1702/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 12P3701/S14L	connector M12	PNP break function (NC)	3 port LED red
IFRM 12P3702/L	cable, 2 m	PNP break function (NC)	LED red



Sn = 4 mm

- extra long housings
- high stability across entire temperature range



general data

mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm

cable, 2 m

housing length	50 mm
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connector M12

housing length	60 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

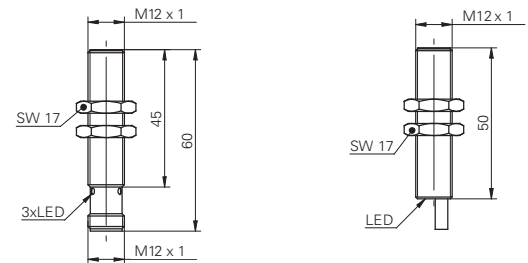
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

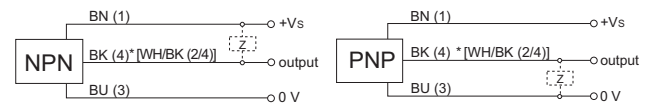
10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings



connection diagrams



order reference	connection types	output circuit	output indicator
IFRM 12N1704/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 12N1704/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 12N3704/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 12N3704/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 12P1704/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 12P1704/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 12P3704/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 12P3704/S14L	connector M12	PNP break function (NC)	3 port LED red



Sn = 4 mm

- M8 x 1 quick disconnect
- high stability across entire temperature range



general data

mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 25 % of Sr
output indicator	3 port LED red

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	18 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
housing length	50 mm
connection types	connector M8

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

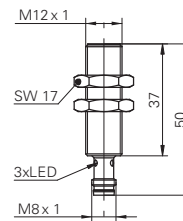
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

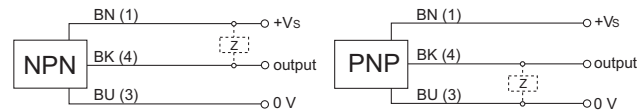
10151720	Sensofix series 12 round
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawing



connection diagrams



order reference

IFRM 12N1701/S35L	NPN make function (NO)
IFRM 12N3701/S35L	NPN break function (NC)
IFRM 12P1701/S35L	PNP make function (NO)
IFRM 12P3701/S35L	PNP break function (NC)

output circuit

**Sn = 4 mm**

- antivalent output
- short housing (50 mm length)

general data

mounting type	flush
nominal sensing distance Sn	4 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
output indicator	3 port LED red
correction factor typ.	mild steel 100 %, stainless steel 80 %, aluminum 50 %

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	PNP complementary (NO / NC)
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
housing length	50 mm
connection types	connector M12
tightening torque max.	15 Nm (A: 10 Nm)

ambient conditions

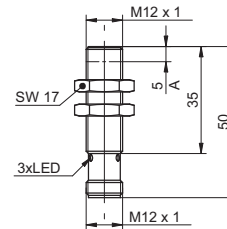
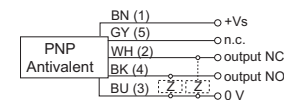
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

10151720	Sensofix series 12 round
for details: see accessories section	

order reference**IR12.P04S-11159797****dimension drawing****connection diagram****correction factors for different mounting situations (approx.)**

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	115 %
Stainless steel	110 %
Aluminum	105 %

remarks

for correct installation refer to "mounting instructions"



Sn = 4 mm

- antivalent output
- long housing (85 mm length)

general data

mounting type	flush
nominal sensing distance Sn	4 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
output indicator	3 port LED red
correction factor typ.	mild steel 100 %, stainless steel 80 %, aluminum 50 %

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	PNP complementary (NO / NC)
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
housing length	85 mm
connection types	connector M12
tightening torque max.	15 Nm (A: 10 Nm)

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

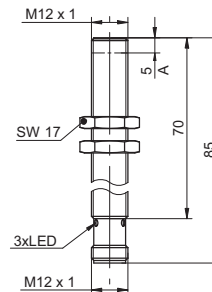
10151720	Sensofix series 12 round
for details: see accessories section	

order reference

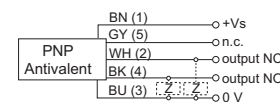
IR12.P04S-11159790



dimension drawing



connection diagram



correction factors for different mounting situations (approx.)

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	115 %
Stainless steel	110 %
Aluminum	105 %

remarks

for correct installation refer to "mounting instructions"

**Sn = 6 mm**

- version with extended Sn *GammaProx*
- quasi shielded mounting

general data

mounting type	flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	6 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 75 %, aluminum 45 %

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)

cable, 2 m

housing length	40 mm
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connector M12

housing length	50 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

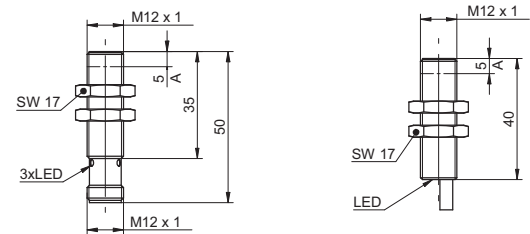
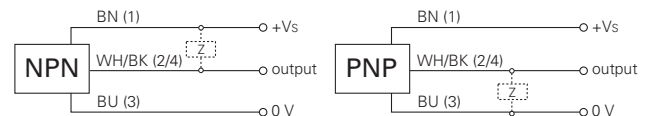
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings**connection diagrams****correction factors for different mounting situations (approx.)**

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	95 %
Aluminum	80 %

remarks

for correct installation refer to "mounting instructions"

order reference	connection types	output circuit	output indicator
IR12.P06S-11148447	cable, 2 m	NPN break function (NC)	LED red
IR12.P06S-11148363	cable, 2 m	NPN make function (NO)	LED red
IR12.P06S-11148657	cable, 2 m	PNP break function (NC)	LED red
IR12.P06S-11148580	cable, 2 m	PNP make function (NO)	LED red
IR12.P06S-11148466	connector M12	NPN break function (NC)	3 port LED red
IR12.P06S-11148364	connector M12	NPN make function (NO)	3 port LED red
IR12.P06S-11148659	connector M12	PNP break function (NC)	3 port LED red
IR12.P06S-11148587	connector M12	PNP make function (NO)	3 port LED red

**Sn = 6 mm**

- version with extended Sn *GammaProx*
- shielded mounting

general data

mounting type	flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	6 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 75 %, aluminum 45 %

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)

cable, 2 m

housing length	50 mm
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connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

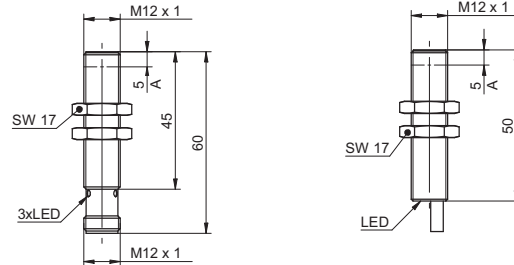
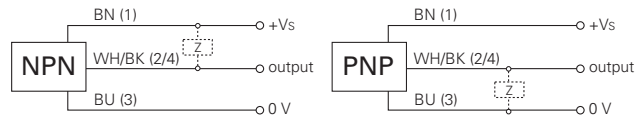
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings**connection diagrams****correction factors for different mounting situations (approx.)**

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	95 %
Aluminum	80 %

remarks

for correct installation refer to "mounting instructions"

order reference	connection types	output circuit	output indicator
IR12.P06S-11148441	cable, 2 m	NPN break function (NC)	LED red
IR12.P06S-11148360	cable, 2 m	NPN make function (NO)	LED red
IR12.P06S-11148655	cable, 2 m	PNP break function (NC)	LED red
IR12.P06S-11148575	cable, 2 m	PNP make function (NO)	LED red
IR12.P06S-11148446	connector M12	NPN break function (NC)	3 port LED red
IR12.P06S-11148362	connector M12	NPN make function (NO)	3 port LED red
IR12.P06S-11148656	connector M12	PNP break function (NC)	3 port LED red
IR12.P06S-11148578	connector M12	PNP make function (NO)	3 port LED red

**Sn = 10 mm**

- version with extended Sn *GammaProx*
- non shielded mounting

general data

mounting type	non-flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	10 mm
temperature drift	± 10 % (0 ... +60 °C) ± 15 % (-25 ... +75 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 75 %, aluminum 50 %

electrical data

switching frequency	< 1,5 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)

cable, 2 m

housing length	40 mm
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connector M12

housing length	50 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

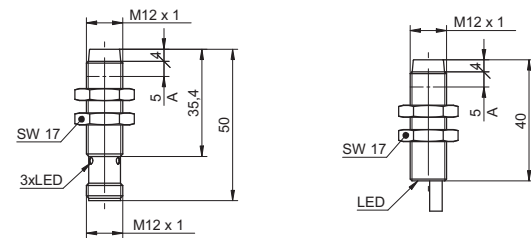
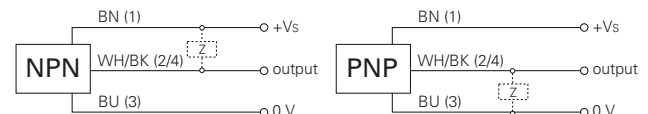
connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings**connection diagrams****correction factors for different mounting situations (approx.)**

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	not possible
Aluminum	90 %

order reference	connection types	output circuit	output indicator
IR12.P10S-11148436	cable, 2 m	NPN break function (NC)	LED red
IR12.P10S-11148327	cable, 2 m	NPN make function (NO)	LED red
IR12.P10S-11148590	cable, 2 m	PNP break function (NC)	LED red
IR12.P10S-11148573	cable, 2 m	PNP make function (NO)	LED red
IR12.P10S-11148439	connector M12	NPN break function (NC)	3 port LED red
IR12.P10S-11148328	connector M12	NPN make function (NO)	3 port LED red
IR12.P10S-11148654	connector M12	PNP break function (NC)	3 port LED red
IR12.P10S-11148574	connector M12	PNP make function (NO)	3 port LED red


Sn = 10 mm

- version with extended Sn *GammaProx*
- non shielded mounting

general data

mounting type	non-flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	10 mm
temperature drift	± 10 % (0 ... +60 °C) ± 15 % (-25 ... +75 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 75 %, aluminum 50 %

electrical data

switching frequency	< 1,5 kHz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)

cable, 2 m

housing length	50 mm
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connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

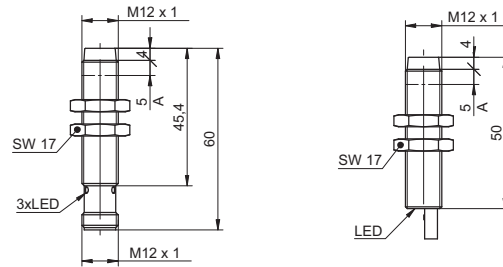
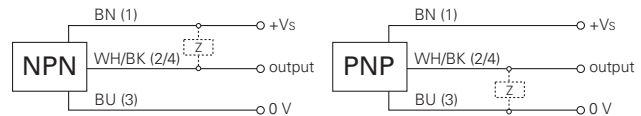
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings

connection diagrams

correction factors for different mounting situations (approx.)

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	not possible
Aluminum	90 %

order reference	connection types	output circuit	output indicator
IR12.P10S-11148366	cable, 2 m	NPN break function (NC)	LED red
IR12.P10S-11148324	cable, 2 m	NPN make function (NO)	LED red
IR12.P10S-11148588	cable, 2 m	PNP break function (NC)	LED red
IR12.P10S-11148566	cable, 2 m	PNP make function (NO)	LED red
IR12.P10S-11148367	connector M12	NPN break function (NC)	3 port LED red
IR12.P10S-11148325	connector M12	NPN make function (NO)	3 port LED red
IR12.P10S-11148589	connector M12	PNP break function (NC)	3 port LED red
IR12.P10S-11148572	connector M12	PNP make function (NO)	3 port LED red



Sn = 8 mm

- quasi shielded mounting
- improved EMC compatibility

general data

mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

cable, 2 m

housing length	35 mm
----------------	-------

connector M12

housing length	45 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

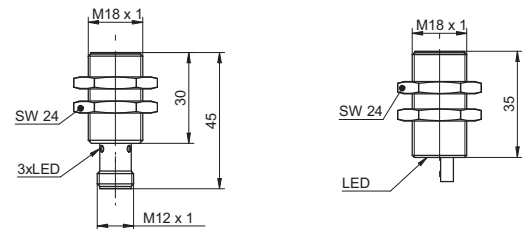
Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

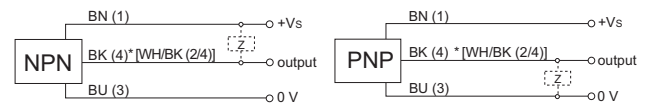
for details: see accessories section

order reference	connection types	output circuit
IFRM 18N17A5/L	cable, 2 m	NPN make function (NO)
IFRM 18N17A5/S14L	connector M12	NPN make function (NO)
IFRM 18N37A5/L	cable, 2 m	NPN break function (NC)
IFRM 18N37A5/S14L	connector M12	NPN break function (NC)
IFRM 18P17A5/L	cable, 2 m	PNP make function (NO)
IFRM 18P17A5/S14L	connector M12	PNP make function (NO)
IFRM 18P37A5/L	cable, 2 m	PNP break function (NC)
IFRM 18P37A5/S14L	connector M12	PNP break function (NC)

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

remarks

for correct installation refer to "mounting instructions"


Sn = 8 mm

- quasi shielded mounting
- improved EMC compatibility



general data

mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

cable, 2 m

housing length	50 mm
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connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

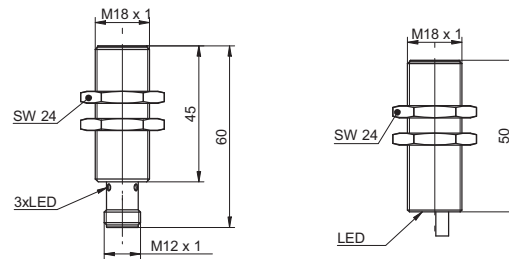
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

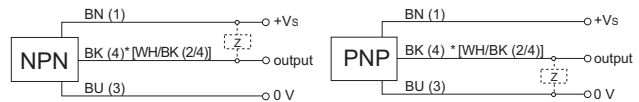
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

remarks

for correct installation refer to "mounting instructions"

order reference	connection types	output circuit	output indicator
IFRM 18N17A3/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 18N17A3/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 18N37A3/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 18N37A3/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 18P17A3/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 18P17A3/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 18P37A3/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 18P37A3/S14L	connector M12	PNP break function (NC)	3 port LED red



Sn = 8 mm

- quasi shielded mounting
- improved EMC compatibility

general data

mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

cable, 2 m

housing length	65 mm
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connector M12

housing length	75 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

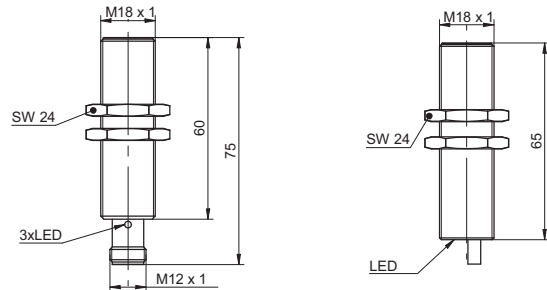
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

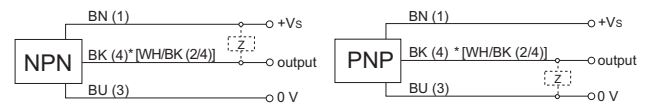
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	



dimension drawings



connection diagrams



remarks

for correct installation refer to "mounting instructions"

order reference	connection types	output circuit	output indicator
IFRM 18N17A4/L	cable, 2 m	NPN make function (NO)	LED red
IFRM 18N17A4/S14L	connector M12	NPN make function (NO)	3 port LED red
IFRM 18N37A4/L	cable, 2 m	NPN break function (NC)	LED red
IFRM 18N37A4/S14L	connector M12	NPN break function (NC)	3 port LED red
IFRM 18P17A4/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 18P17A4/S14L	connector M12	PNP make function (NO)	3 port LED red
IFRM 18P37A4/L	cable, 2 m	PNP break function (NC)	LED red
IFRM 18P37A4/S14L	connector M12	PNP break function (NC)	3 port LED red


Sn = 8 mm

- voltage supply range +Vs 10 ... 50 VDC
- quasi shielded mounting
- M8 x 1 quick disconnect


general data

mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	3 ... 25 % of Sr
output indicator	4 port LED red

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
housing length	50 mm
connection types	connector M8

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

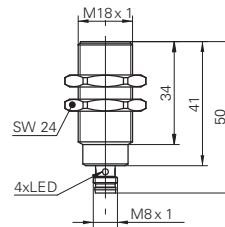
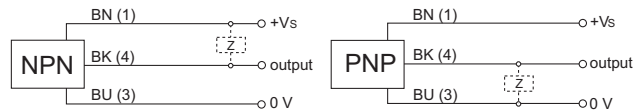
connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawing

connection diagrams

remarks

for correct installation refer to "mounting instructions"

order reference
output circuit

IFRM 18N1701/S35L	NPN make function (NO)
IFRM 18N3701/S35L	NPN break function (NC)
IFRM 18P1701/S35L	PNP make function (NO)
IFRM 18P3701/S35L	PNP break function (NC)



Sn = 12 mm

- non shielded mounting

general data	
mounting type	non-flush
nominal sensing distance Sn	12 mm
hysteresis	3 ... 25 % of Sr
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	15 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
cable, 2 m	
housing length	39 mm
connector M12	
housing length	52,5 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

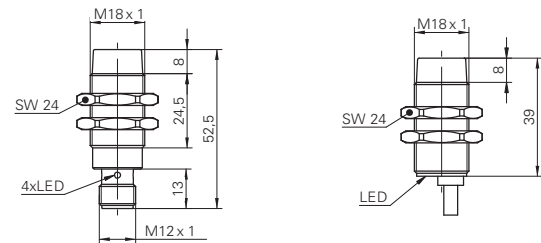
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

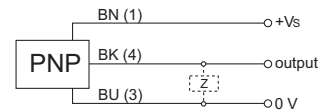
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	connection types	output indicator
IFRM 18P1301/L	cable, 2 m	LED red
IFRM 18P1301/S14L	connector M12	4 port LED red

dimension drawings



connection diagram





Sn = 8 mm

- shielded mounting
- antivalent output

general data

mounting type	flush
nominal sensing distance Sn	8 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 40 %

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	PNP complementary (NO / NC)
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

cable, 2 m

housing length	50 mm
----------------	-------

connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

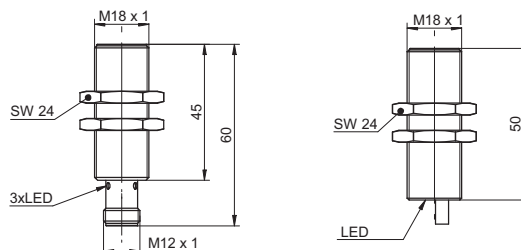
Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)

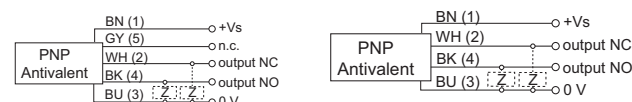
for details: see accessories section

order reference	connection types	output indicator
IR18.P08S-11184279	cable, 2 m	LED red
IR18.P08S-11184278	connector M12	3 port LED red

dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)

Mounting material	Correction factor	Mounting material	Correction factor	Mounting material	Correction factor
Mild steel	100 %	Mild steel	105 %	Mild steel	not possible
Stainless steel	100 %	Stainless steel	100 %	Stainless steel	100 %
Aluminium	100 %	Aluminium	95 %	Aluminium	80 %



Sn = 12 mm

- version with extended Sn *GammaProx*
- quasi shielded mounting

general data

mounting type	flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	12 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 40 %

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

cable, 2 m

housing length	35 mm
----------------	-------

connector M12

housing length	45 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

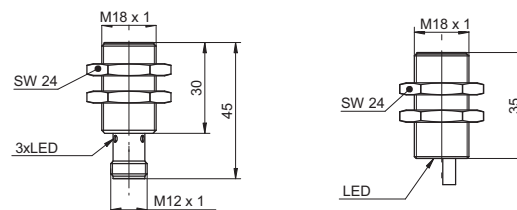
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

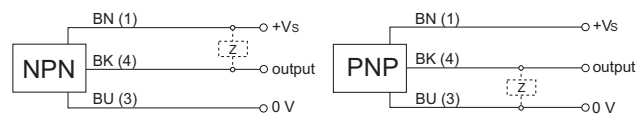
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	110 %
Aluminum	65 %

order reference	connection types	output circuit	output indicator
IR18.P12S-11149099	cable, 2 m	NPN break function (NC)	LED red
IR18.P12S-11148846	cable, 2 m	NPN make function (NO)	LED red
IR18.P12S-11149168	cable, 2 m	PNP break function (NC)	LED red
IR18.P12S-11149146	cable, 2 m	PNP make function (NO)	LED red
IR18.P12S-11149112	connector M12	NPN break function (NC)	3 port LED red
IR18.P12S-11148847	connector M12	NPN make function (NO)	3 port LED red
IR18.P12S-11149169	connector M12	PNP break function (NC)	3 port LED red
IR18.P12S-11149149	connector M12	PNP make function (NO)	3 port LED red


Sn = 12 mm

- version with extended Sn *GammaProx*
- shielded mounting


general data

mounting type	flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	12 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 40 %

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

cable, 2 m

housing length	50 mm
----------------	-------

connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
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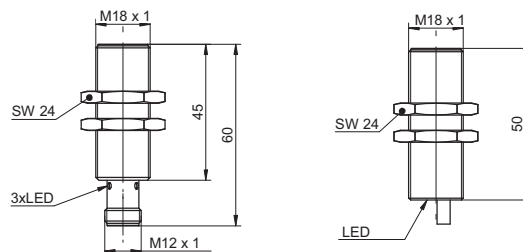
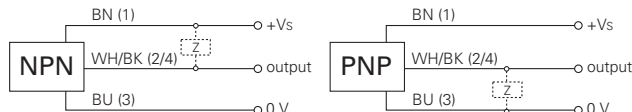
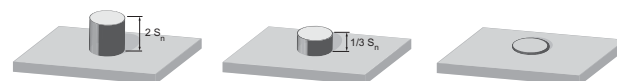
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
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additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings

connection diagrams

correction factors for different mounting situations (approx.)


Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	110 %
Aluminum	65 %

order reference	connection types	output circuit	output indicator
IR18.P12S-11148902	cable, 2 m	NPN break function (NC)	LED red
IR18.P12S-11148844	cable, 2 m	NPN make function (NO)	LED red
IR18.P12S-11149166	cable, 2 m	PNP break function (NC)	LED red
IR18.P12S-11149142	cable, 2 m	PNP make function (NO)	LED red
IR18.P12S-11149098	connector M12	NPN break function (NC)	3 port LED red
IR18.P12S-11148845	connector M12	NPN make function (NO)	3 port LED red
IR18.P12S-11149167	connector M12	PNP break function (NC)	3 port LED red
IR18.P12S-11148329	connector M12	PNP make function (NO)	3 port LED red



Sn = 15 mm

- version with extended Sn *GammaProx*
- non shielded mounting



general data

mounting type	non-flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	15 mm
temperature drift	- 5 % / + 10 % (+10 ... +60 °C) - 5 % / + 15 % (0 ... +65 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 85 %, aluminum 55 %

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

cable, 2 m

housing length	35 mm
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connector M12

housing length	45 mm
----------------	-------

ambient conditions

operating temperature	0 ... +65 °C
protection class	IP 67

connectors and mating connectors

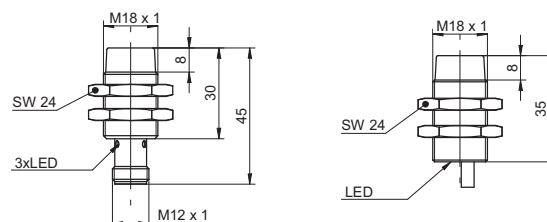
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

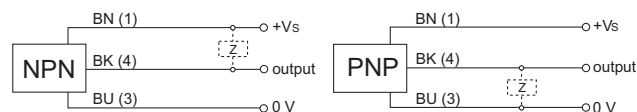
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	115 %
Aluminum	95 %

order reference	connection types	output circuit	output indicator
IR18.P15S-11148900	cable, 2 m	NPN break function (NC)	LED red
IR18.P15S-11148809	cable, 2 m	NPN make function (NO)	LED red
IR18.P15S-11149164	cable, 2 m	PNP break function (NC)	LED red
IR18.P15S-11149138	cable, 2 m	PNP make function (NO)	LED red
IR18.P15S-11148901	connector M12	NPN break function (NC)	3 port LED red
IR18.P15S-11148820	connector M12	NPN make function (NO)	3 port LED red
IR18.P15S-11149165	connector M12	PNP break function (NC)	3 port LED red
IR18.P15S-11149140	connector M12	PNP make function (NO)	3 port LED red



Sn = 15 mm

- version with extended Sn *GammaProx*
- non shielded mounting



general data

mounting type	non-flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	15 mm
temperature drift	- 5 % / + 10 % (+10 ... +60 °C) - 5 % / + 15 % (0 ... +65 °C)
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 85 %, aluminum 55 %

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

cable, 2 m

housing length	50 mm
----------------	-------

connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	0 ... +65 °C
protection class	IP 67

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m

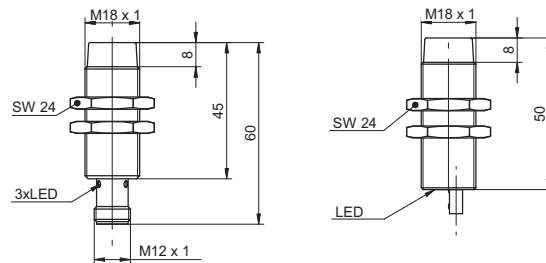
additional cable connectors and field wireable connectors: see accessories

Accessories

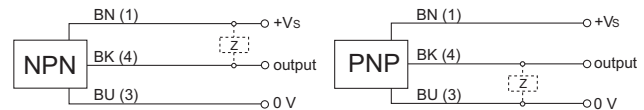
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	115 %
Aluminum	95 %

order reference	connection types	output circuit	output indicator
IR18.P15S-11148848	cable, 2 m	NPN break function (NC)	LED red
IR18.P15S-11148796	cable, 2 m	NPN make function (NO)	LED red
IR18.P15S-11149161	cable, 2 m	PNP break function (NC)	LED red
IR18.P15S-11149115	cable, 2 m	PNP make function (NO)	LED red
IR18.P15S-11148849	connector M12	NPN break function (NC)	3 port LED red
IR18.P15S-11148813	connector M12	NPN make function (NO)	3 port LED red
IR18.P15S-11149163	connector M12	PNP break function (NC)	3 port LED red
IR18.P15S-11149133	connector M12	PNP make function (NO)	3 port LED red



Sn = 10 mm

- voltage supply range +Vs 10 ... 50 VDC
- shielded mounting
- M12 x 1 quick disconnect



general data

mounting type	flush
nominal sensing distance Sn	10 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	30 mm

cable, 2 m

housing length	60 mm
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connector M12

housing length	65 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

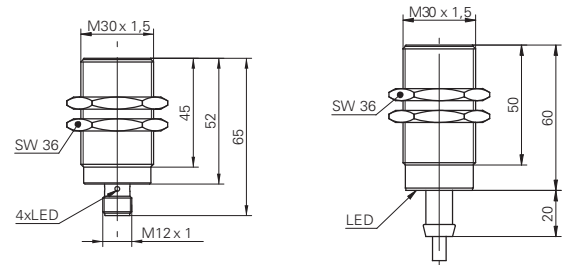
connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

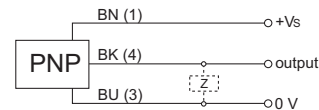
Accessories

11163237	Adapter for pulse stretching M12
for details: see accessories section	

dimension drawings



connection diagram



order reference	connection types	output circuit	output indicator
IFRM 30P1501/S14L	connector M12	PNP make function (NO)	4 port LED red
IFRM 30P1601/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 30P3501/S14L	connector M12	PNP break function (NC)	4 port LED red
IFRM 30P3601/L	cable, 2 m	PNP break function (NC)	LED red



Sn = 15 mm

- voltage supply range +Vs 10 ... 50 VDC
- non shielded mounting
- M12 x 1 quick disconnect

general data

mounting type	non-flush
nominal sensing distance Sn	15 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 50 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	30 mm

cable, 2 m

housing length	69,5 mm
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connector M12

housing length	74,4 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

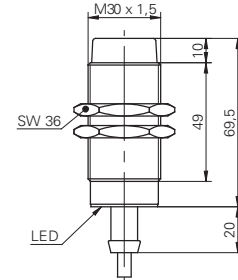
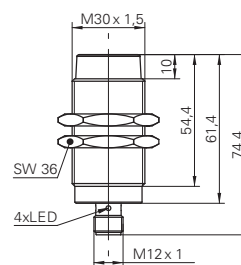
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

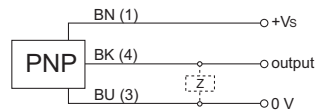
11163237	Adapter for pulse stretching M12
for details: see accessories section	



dimension drawings



connection diagram



order reference	connection types	output circuit	output indicator
IFRM 30P1101/S14L	connector M12	PNP make function (NO)	4 port LED red
IFRM 30P1201/L	cable, 2 m	PNP make function (NO)	LED red
IFRM 30P3101/S14L	connector M12	PNP break function (NC)	4 port LED red
IFRM 30P3201/L	cable, 2 m	PNP break function (NC)	LED red



Sn = 18 mm

- version with extended Sn *GammaProx*
- shielded mounting

general data

mounting type	flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	18 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 40 %

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	30 mm
tightening torque max.	140 Nm

cable, 2 m

housing length	35 mm
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connector M12

housing length	45 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

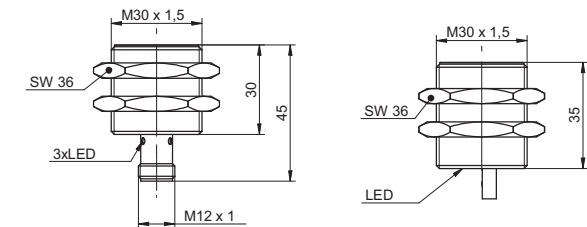
connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

11163237	Adapter for pulse stretching M12
for details: see accessories section	

dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	100 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	105 %
Stainless steel	105 %
Aluminum	100 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	not possible
Aluminum	75 %

order reference	connection types	output circuit	output indicator
IR30.P18S-11174004	cable, 2 m	NPN complementary (NO / NC)	LED red
IR30.P18S-11174005	cable, 2 m	PNP complementary (NO / NC)	LED red
IR30.P18S-11174008	connector M12	NPN complementary (NO / NC)	3 port LED red
IR30.P18S-11174009	connector M12	PNP complementary (NO / NC)	3 port LED red


Sn = 18 mm

- version with extended Sn *GammaProx*
- shielded mounting

general data

mounting type	flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	18 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 40 %

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	30 mm
tightening torque max.	140 Nm

cable, 2 m

housing length	50 mm
----------------	-------

connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m

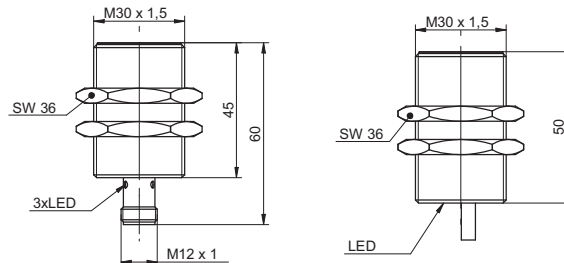
additional cable connectors and field wireable connectors: see accessories

Accessories

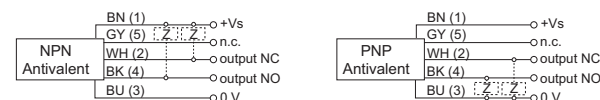
11163237	Adapter for pulse stretching M12
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for details: see accessories section

dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)

Mounting material	Correction factor	Mounting material	Correction factor	Mounting material	Correction factor
Mild steel	100 %	Mild steel	105 %	Mild steel	not possible
Stainless steel	100 %	Stainless steel	105 %	Stainless steel	not possible
Aluminum	100 %	Aluminum	100 %	Aluminum	75 %

order reference	connection types	output circuit	output indicator
IR30.P18S-11174003	cable, 2 m	NPN complementary (NO / NC)	LED red
IR30.P18S-11171575	cable, 2 m	PNP complementary (NO / NC)	LED red
IR30.P18S-11174006	connector M12	NPN complementary (NO / NC)	3 port LED red
IR30.P18S-11174007	connector M12	PNP complementary (NO / NC)	3 port LED red



Sn = 24 mm

- version with extended Sn *GammaProx*
- non shielded mounting

general data

mounting type	non-flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	24 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 50 %

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	30 mm
tightening torque max.	140 Nm

cable, 2 m

housing length	35 mm
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connector M12

housing length	45 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m

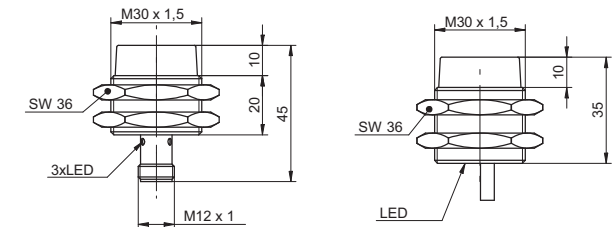
additional cable connectors and field wireable connectors: see accessories

Accessories

11163237	Adapter for pulse stretching M12
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for details: see accessories section

dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	115 %
Aluminum	90 %

order reference	connection types	output circuit	output indicator
IR30.P24S-11174032	cable, 2 m	NPN complementary (NO / NC)	LED red
IR30.P24S-11174033	cable, 2 m	PNP complementary (NO / NC)	LED red
IR30.P24S-11174036	connector M12	NPN complementary (NO / NC)	3 port LED red
IR30.P24S-11174037	connector M12	PNP complementary (NO / NC)	3 port LED red



Sn = 24 mm

- version with extended Sn *GammaProx*
- non shielded mounting



general data

mounting type	non-flush
special type	enhanced distance (<i>GammaProx</i>)
nominal sensing distance Sn	24 mm
temperature drift	± 10 %
hysteresis	3 ... 20 % of Sr
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 50 %

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	30 mm
tightening torque max.	140 Nm

cable, 2 m

housing length	50 mm
----------------	-------

connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m

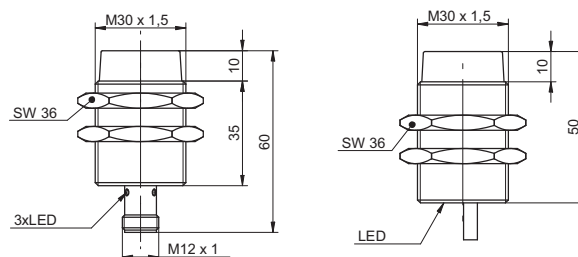
additional cable connectors and field wireable connectors: see accessories

Accessories

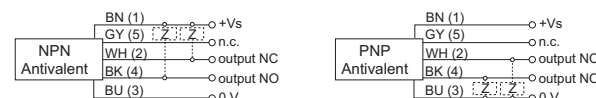
11163237	Adapter for pulse stretching M12
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for details: see accessories section

dimension drawings



connection diagrams



correction factors for different mounting situations (approx.)

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	100 %
Stainless steel	95 %
Aluminum	95 %

Mounting material	Correction factor
Mild steel	not possible
Stainless steel	115 %
Aluminum	90 %

order reference	connection types	output circuit	output indicator
IR30.P24S-11174030	cable, 2 m	NPN complementary (NO / NC)	LED red
IR30.P24S-11174031	cable, 2 m	PNP complementary (NO / NC)	LED red
IR30.P24S-11174034	connector M12	NPN complementary (NO / NC)	3 port LED red
IR30.P24S-11174035	connector M12	PNP complementary (NO / NC)	3 port LED red



Sn = 0,8 mm

- smallest rectangular housing
- stainless steel housing



general data

mounting type	flush
nominal sensing distance Sn	0,8 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red (backside)

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

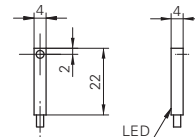
mechanical data

type	rectangular
material (sensing face)	EP
housing material	stainless steel
dimension	4 mm
housing length	22 mm
connection types	cable, 2 m

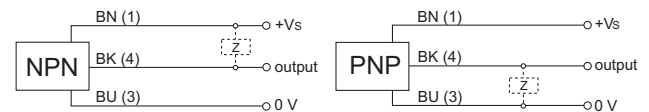
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagrams



order reference

output circuit

IFFM 04N1501/O1L	NPN make function (NO)
IFFM 04N3501/O1L	NPN break function (NC)
IFFM 04P1501/O1L	PNP make function (NO)
IFFM 04P3501/O1L	PNP break function (NC)


Sn = 1 mm

- miniature connector M5 x 0,5
- smallest rectangular housing with connector



general data

mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	LCP
housing material	brass nickel plated
dimension	6 mm

cable, 2 m

housing length	20 mm
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connector M5

housing length	24 mm
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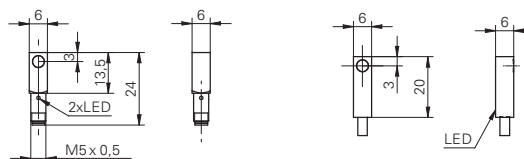
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

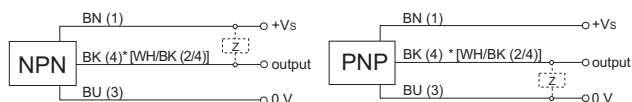
connectors and mating connectors

ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

dimension drawings



connection diagrams



order reference	connection types	output circuit	output indicator
IFFM 06N15A3/O1L	cable, 2 m	NPN make function (NO)	LED red (backside)
IFFM 06N15A3/O1S05L	connector M5	NPN make function (NO)	2 port LED red
IFFM 06N35A3/O1L	cable, 2 m	NPN break function (NC)	LED red (backside)
IFFM 06N35A3/O1S05L	connector M5	NPN break function (NC)	2 port LED red
IFFM 06P15A3/O1L	cable, 2 m	PNP make function (NO)	LED red (backside)
IFFM 06P15A3/O1S05L	connector M5	PNP make function (NO)	2 port LED red
IFFM 06P35A3/O1L	cable, 2 m	PNP break function (NC)	LED red (backside)
IFFM 06P35A3/O1S05L	connector M5	PNP break function (NC)	2 port LED red



Sn = 1 mm

- standard cable version
- high switching frequency



general data

mounting type	flush
nominal sensing distance Sn	1 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red (backside)

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

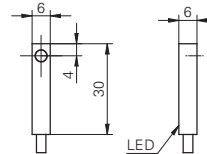
mechanical data

type	rectangular
material (sensing face)	LCP
housing material	brass nickel plated
dimension	6 mm
housing length	30 mm
connection types	cable, 2 m

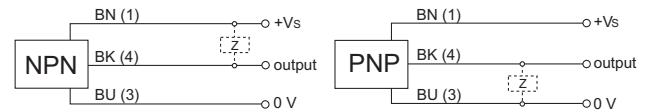
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagrams



order reference

output circuit

IFFM 06N15A1/O1L	NPN make function (NO)
IFFM 06N35A1/O1L	NPN break function (NC)
IFFM 06P15A1/O1L	PNP make function (NO)
IFFM 06P35A1/O1L	PNP break function (NC)



Sn = 2 mm

- extra flat version
- through bore for M3 screw
- robust metal housing



general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	die-cast zinc nickel plated
dimension	8 mm
housing length	16 mm

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

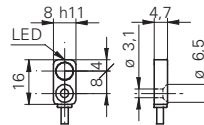
connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

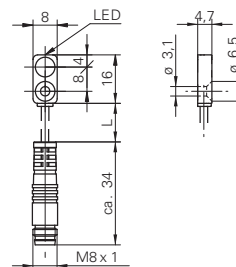
Accessories

11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawing

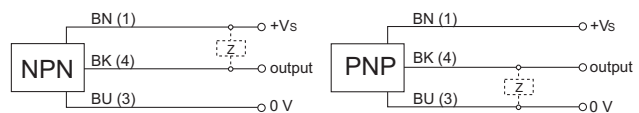


flylead connector version



standard cable length 200 mm (L)

connection diagrams



order reference	connection types	output circuit
IFFM 08N17A6/KS35L	flylead connector M8	NPN make function (NO)
IFFM 08N17A6/L	cable, 2 m	NPN make function (NO)
IFFM 08N37A6/KS35L	flylead connector M8	NPN break function (NC)
IFFM 08N37A6/L	cable, 2 m	NPN break function (NC)
IFFM 08P17A6/KS35L	flylead connector M8	PNP make function (NO)
IFFM 08P17A6/L	cable, 2 m	PNP make function (NO)
IFFM 08P37A6/KS35L	flylead connector M8	PNP break function (NC)
IFFM 08P37A6/L	cable, 2 m	PNP break function (NC)


Sn = 2 mm

- shortest rectangular design with M8 x 1 connector
- cable and connector versions
- high switching frequency

general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	die-cast zinc nickel plated
dimension	8 mm

cable, 2 m

housing length	20 mm
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connector M8

housing length	27,4 mm
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ambient conditions

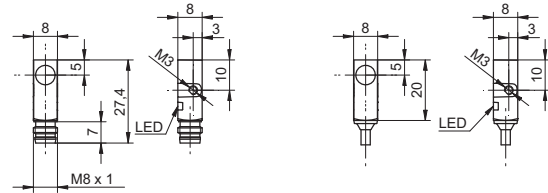
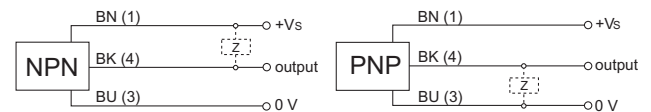
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings

connection diagrams


order reference	connection types	output circuit
IFFM 08N1703/O1L	cable, 2 m	NPN make function (NO)
IFFM 08N17A5/O1S35L	connector M8	NPN make function (NO)
IFFM 08N3703/O1L	cable, 2 m	NPN break function (NC)
IFFM 08N37A5/O1S35L	connector M8	NPN break function (NC)
IFFM 08P1703/O1L	cable, 2 m	PNP make function (NO)
IFFM 08P17A5/O1S35L	connector M8	PNP make function (NO)
IFFM 08P3703/O1L	cable, 2 m	PNP break function (NC)
IFFM 08P37A5/O1S35L	connector M8	PNP break function (NC)


Sn = 2 mm

- high switching frequency
- cable and connector versions


general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	8 mm

cable, 2 m

housing length	28,5 mm
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connector M8

housing length	35,5 mm
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ambient conditions

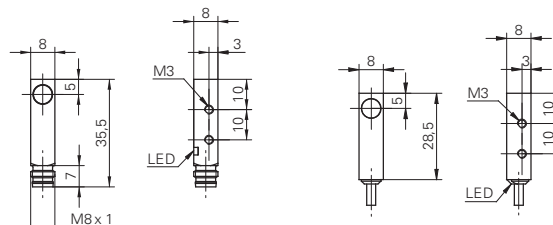
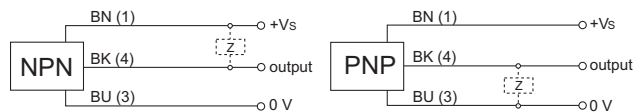
operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings

connection diagrams


* .../S05L pin 2 & 4 electrically connected

order reference	connection types	output circuit
IFFM 08N1702/O1L	cable, 2 m	NPN make function (NO)
IFFM 08N17A3/O1S35L	connector M8	NPN make function (NO)
IFFM 08N3702/O1L	cable, 2 m	NPN break function (NC)
IFFM 08N37A3/O1S35L	connector M8	NPN break function (NC)
IFFM 08P1702/O1L	cable, 2 m	PNP make function (NO)
IFFM 08P17A3/O1S35L	connector M8	PNP make function (NO)
IFFM 08P3702/O1L	cable, 2 m	PNP break function (NC)
IFFM 08P37A3/O1S35L	connector M8	PNP break function (NC)



Sn = 2 mm

- high switching frequency
- cable and connector versions

general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	die-cast zinc nickel plated
dimension	8 mm

cable, 2 m

housing length	38,5 mm
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connector M8

housing length	45,9 mm
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ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

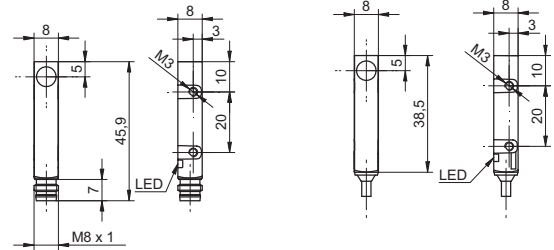
connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

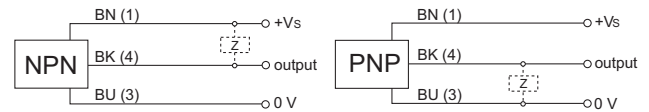
Accessories

11163236	Adapter for pulse stretching M8
for details: see accessories section	

dimension drawings



connection diagrams



order reference	connection types	output circuit
IFFM 08N1701/O1L	cable, 2 m	NPN make function (NO)
IFFM 08N17A1/O1S35L	connector M8	NPN make function (NO)
IFFM 08N3701/O1L	cable, 2 m	NPN break function (NC)
IFFM 08N37A1/O1S35L	connector M8	NPN break function (NC)
IFFM 08P1701/O1L	cable, 2 m	PNP make function (NO)
IFFM 08P17A1/O1S35L	connector M8	PNP make function (NO)
IFFM 08P3701/O1L	cable, 2 m	PNP break function (NC)
IFFM 08P37A1/O1S35L	connector M8	PNP break function (NC)


Sn = 2 mm

- active area at mid position
- high switching frequency
- cable and connector versions

general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	8 mm
housing length	49 mm
connection types	connector M8

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

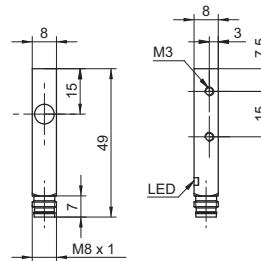
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

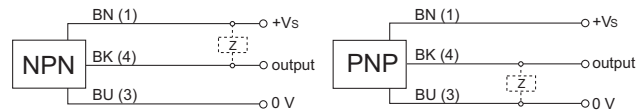
11163236	Adapter for pulse stretching M8
for details: see accessories section	



dimension drawing



connection diagrams



order reference

output circuit

IFFM 08N1703/O2S35L	NPN make function (NO)
IFFM 08N3703/O2S35L	NPN break function (NC)
IFFM 08P1703/O2S35L	PNP make function (NO)
IFFM 08P3703/O2S35L	PNP break function (NC)



Sn = 2 mm

- high switching frequency
- cable and connector versions
- very long housing

general data

mounting type	flush
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	die-cast zinc nickel plated
dimension	8 mm
housing length	59,4 mm
connection types	connector M8

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

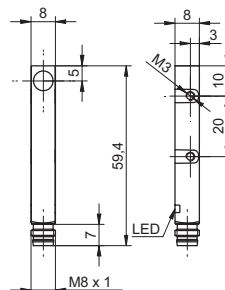
Accessories

11163236	Adapter for pulse stretching M8
for details: see accessories section	

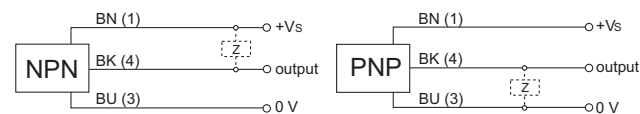
order reference

order reference	output circuit
IFFM 08N1701/O1S35L	NPN make function (NO)
IFFM 08N3701/O1S35L	NPN break function (NC)
IFFM 08P1701/O1S35L	PNP make function (NO)
IFFM 08P3701/O1S35L	PNP break function (NC)

dimension drawing



connection diagrams





Sn = 4 mm



- extra flat version
- miniature connector M5 x 0,5

general data

mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
housing length	23,5 mm
connection types	connector M5

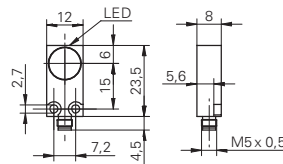
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

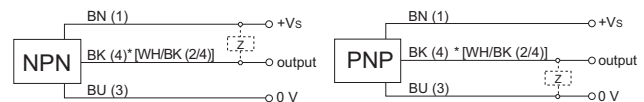
connectors and mating connectors

ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

dimension drawing



connection diagrams



* .../S05L pin 2 & 4 electrically connected

order reference

output circuit

IFFM 12N17A3/S05L	NPN make function (NO)
IFFM 12N37A3/S05L	NPN break function (NC)
IFFM 12P17A3/S05L	PNP make function (NO)
IFFM 12P37A3/S05L	PNP break function (NC)

**Sn = 5 mm**

- voltage supply range +Vs 10 ... 50 VDC
- extra flat version
- 4 port LED

**general data**

mounting type	flush
nominal sensing distance Sn	5 mm
hysteresis	3 ... 20 % of Sr
output indicator	4 port LED red

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 50 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 3 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	20 mm
housing length	32 mm
connection types	connector M8

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

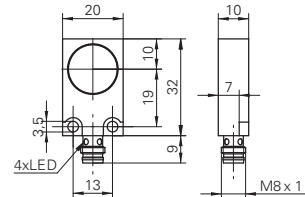
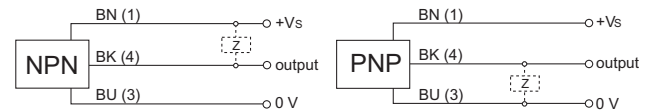
connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

10152385	Sensofix series 18/20 inductive rectangular
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawing**connection diagrams****order reference****output circuit**

IFFM 20N1501/S35L	NPN make function (NO)
IFFM 20N3501/S35L	NPN break function (NC)
IFFM 20P1501/S35L	PNP make function (NO)
IFFM 20P3501/S35L	PNP break function (NC)



Sn = 8 mm

- increased sensing distance
- extra flat version



general data

mounting type	flush
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
material (sensing face)	PBT
housing material	brass nickel plated
dimension	20 mm
housing length	32 mm
connection types	connector M8

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

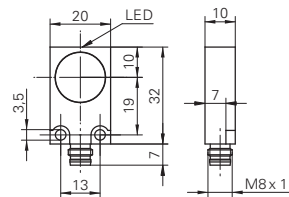
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

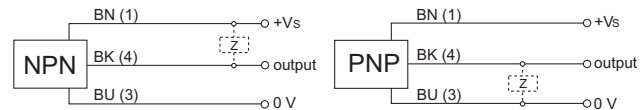
10152385	Sensofix series 18/20 inductive rectangular
11163236	Adapter for pulse stretching M8

for details: see accessories section

dimension drawing



connection diagrams



order reference

IFFM 20N17A3/S35L	NPN make function (NO)
IFFM 20N37A3/S35L	NPN break function (NC)
IFFM 20P17A3/S35L	PNP make function (NO)
IFFM 20P37A3/S35L	PNP break function (NC)

output circuit



Sn = 2 mm

- robust steel housing
- high switching frequency
- mounting with special support

general data

mounting type	flush
special type	factor 1
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	5 ... 36 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm

cable, 2 m

housing length	40 mm
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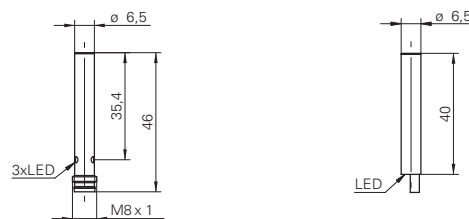
connector M8

housing length	46 mm
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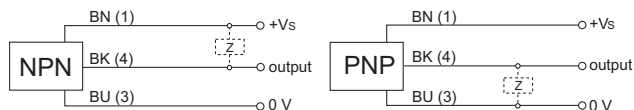
ambient conditions

operating temperature	-25 ... +75 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

dimension drawings



connection diagrams



connectors and mating connectors

ESG 32SH0200 Connector M8, 3 pin, straight, 2 m

ESW 31SH0200 Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

order reference	connection types	output circuit	voltage supply range +Vs	output indicator
IR06.P02F-11119425	cable, 2 m	NPN break function (NC)	5 ... 36 VDC	LED red
IR06.P02F-11119423	cable, 2 m	NPN make function (NO)	5 ... 36 V AC/DC	LED red
IR06.P02F-11119424	cable, 2 m	PNP break function (NC)	5 ... 36 V AC/DC	LED red
IR06.P02F-11119422	cable, 2 m	PNP make function (NO)	5 ... 36 V AC/DC	LED red
IR06.P02F-11119421	connector M8	NPN break function (NC)	5 ... 36 V AC/DC	3 port LED red
IR06.P02F-11117732	connector M8	NPN make function (NO)	5 ... 36 V AC/DC	3 port LED red
IR06.P02F-11119408	connector M8	PNP break function (NC)	5 ... 36 V AC/DC	3 port LED red
IR06.P02F-11117730	connector M8	PNP make function (NO)	5 ... 36 V AC/DC	3 port LED red



Sn = 2 mm

- robust steel housing
- high switching frequency

general data

mounting type	flush
special type	factor 1
nominal sensing distance Sn	2 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	5 ... 36 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel
dimension	8 mm
tightening torque max.	10 Nm

cable, 2 m

housing length	40 mm
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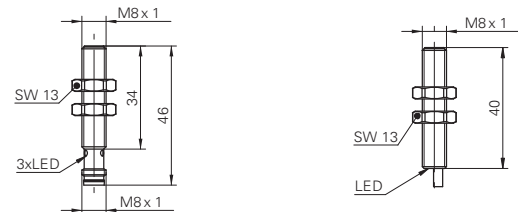
connector M8

housing length	46 mm
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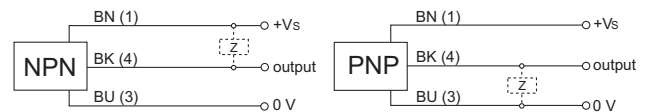
ambient conditions

operating temperature	-25 ... +75 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

dimension drawings



connection diagrams



connectors and mating connectors

ESG 32SH0200 Connector M8, 3 pin, straight, 2 m

ESW 31SH0200 Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8

for details: see accessories section

order reference	connection types	output circuit	output indicator
IR08.P02F-11119431	cable, 2 m	NPN break function (NC)	LED red
IR08.P02F-11119429	cable, 2 m	NPN make function (NO)	LED red
IR08.P02F-11119430	cable, 2 m	PNP break function (NC)	LED red
IR08.P02F-11119428	cable, 2 m	PNP make function (NO)	LED red
IR08.P02F-11119427	connector M8	NPN break function (NC)	3 port LED red
IR08.P02F-11116607	connector M8	NPN make function (NO)	3 port LED red
IR08.P02F-11119426	connector M8	PNP break function (NC)	3 port LED red
IR08.P02F-11111235	connector M8	PNP make function (NO)	3 port LED red



Sn = 4 mm

- high stability across entire temperature range



general data

mounting type	flush
special type	factor 1
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	5 ... 36 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm

cable, 2 m

housing length	40 mm
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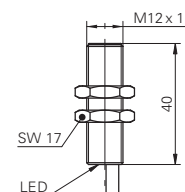
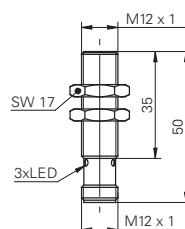
connector M12

housing length	50 mm
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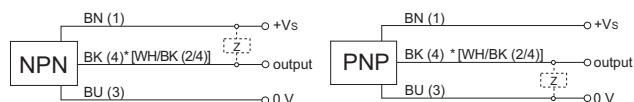
ambient conditions

operating temperature	-25 ... +75 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

dimension drawings



connection diagrams



* pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12

for details: see accessories section

order reference	connection types	output circuit	output indicator
IR12.P04F-11119439	cable, 2 m	NPN break function (NC)	LED red
IR12.P04F-11119438	cable, 2 m	NPN make function (NO)	LED red
IR12.P04F-11119496	cable, 2 m	PNP break function (NC)	LED red
IR12.P04F-11119436	cable, 2 m	PNP make function (NO)	LED red
IR12.P04F-11119435	connector M12	NPN break function (NC)	3 port LED red
IR12.P04F-11116610	connector M12	NPN make function (NO)	3 port LED red
IR12.P04F-11119433	connector M12	PNP break function (NC)	3 port LED red
IR12.P04F-11111236	connector M12	PNP make function (NO)	3 port LED red



Sn = 6 mm

- robust steel housing
- high switching frequency



general data

mounting type	flush
special type	factor 1
nominal sensing distance Sn	6 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	5 ... 36 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

cable, 2 m

housing length	50 mm
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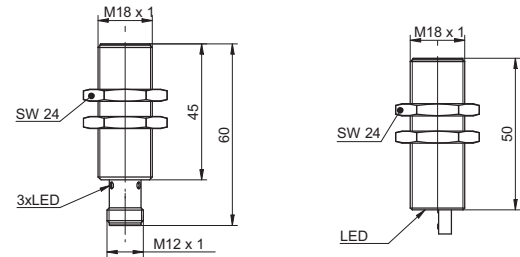
connector M12

housing length	60 mm
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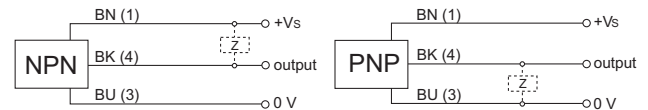
ambient conditions

operating temperature	-25 ... +75 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

dimension drawings



connection diagrams



connectors and mating connectors

ESG 34SH0200 Connector M12, 3 pin, straight, 2 m

ESW 33SH0200 Connector M12, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

for details: see accessories section

order reference	connection types	output circuit	output indicator
IR18.P06F-11119473	cable, 2 m	NPN break function (NC)	LED red
IR18.P06F-11119459	cable, 2 m	NPN make function (NO)	LED red
IR18.P06F-11119472	cable, 2 m	PNP break function (NC)	LED red
IR18.P06F-11119458	cable, 2 m	PNP make function (NO)	LED red
IR18.P06F-11119457	connector M12	NPN break function (NC)	3 port LED red
IR18.P06F-11117735	connector M12	NPN make function (NO)	3 port LED red
IR18.P06F-11119456	connector M12	PNP break function (NC)	3 port LED red
IR18.P06F-11117733	connector M12	PNP make function (NO)	3 port LED red



Sn = 8 mm

- robust steel housing
- high switching frequency



general data

mounting type	quasi-flush
special type	factor 1
nominal sensing distance Sn	8 mm
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	5 ... 36 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

cable, 2 m

housing length	50 mm
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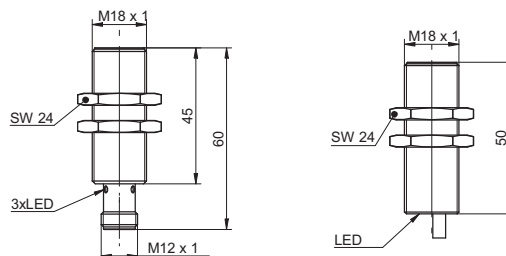
connector M12

housing length	60 mm
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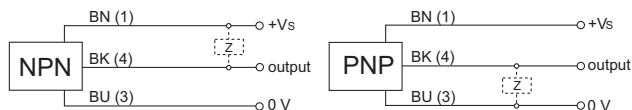
ambient conditions

operating temperature	-25 ... +75 °C
storage temperature	-40 ... +85 °C
protection class	IP 67

dimension drawings



connection diagrams



connectors and mating connectors

ESG 34SH0200 Connector M12, 3 pin, straight, 2 m

ESW 33SH0200 Connector M12, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

for details: see accessories section

order reference	connection types	output circuit	output indicator
IR18.P08F-11119479	cable, 2 m	NPN break function (NC)	LED red
IR18.P08F-11119477	cable, 2 m	NPN make function (NO)	LED red
IR18.P08F-11119478	cable, 2 m	PNP break function (NC)	LED red
IR18.P08F-11119476	cable, 2 m	PNP make function (NO)	LED red
IR18.P08F-11119475	connector M12	NPN break function (NC)	3 port LED red
IR18.P08F-11116612	connector M12	NPN make function (NO)	3 port LED red
IR18.P08F-11119474	connector M12	PNP break function (NC)	3 port LED red
IR18.P08F-11111237	connector M12	PNP make function (NO)	3 port LED red

**Sn = 3 mm**

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C

general data

mounting type	non-flush
special type	hygienic design
nominal sensing distance Sn	3 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab EHEDG REGULATION (EC) 1935/2004 REGULATION (EC) 2023/2006 REGULATION (EU) 1282/2011 FDA 21 CFR § 175.300 FDA 21 CFR § 177.2600 FCN 742

electrical data

switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

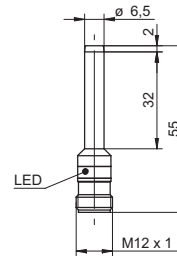
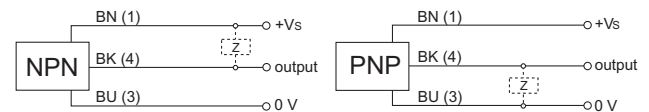
type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	6,5 mm
housing length	55 mm
connection types	connector M12

ambient conditions

operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+

order reference**output circuit**

IFBR 06N13T1/S14L-9	NPN make function (NO)
IFBR 06N33T1/S14L-9	NPN break function (NC)
IFBR 06P13T1/S14L-9	PNP make function (NO)
IFBR 06P33T1/S14L-9	PNP break function (NC)

**dimension drawing****connection diagrams**

* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP

additional cable connectors and field wireable connectors: see accessories

Accessories

HI06-1H	Mounting for sensors in hygienic design Ø 6,5 mm
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for details: see accessories section



Sn = 4 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C

general data

mounting type	flush
special type	hygienic design
nominal sensing distance Sn	4 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab EHEDG REGULATION (EC) 1935/2004 REGULATION (EC) 2023/2006 REGULATION (EU) 1282/2011 FDA 21 CFR § 175.300 FDA 21 CFR § 177.2600 FCN 742

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	11 mm

cable PVC, 2 m

housing length	54 mm
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connector M12

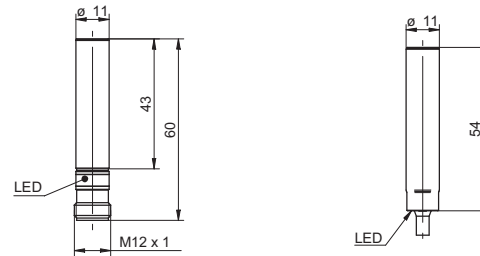
housing length	60 mm
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ambient conditions

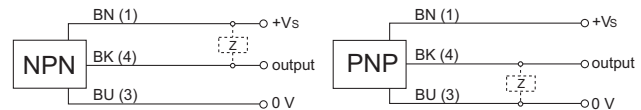
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+



dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP

additional cable connectors and field wireable connectors: see accessories

Accessories

HI11-1H	Mounting for sensors in hygienic design Ø 11 mm
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for details: see accessories section

order reference	connection types	output circuit
IFBR 11N17T1/L-9	cable PVC, 2 m	NPN make function (NO)
IFBR 11N17T1/S14L-9	connector M12	NPN make function (NO)
IFBR 11N37T1/L-9	cable PVC, 2 m	NPN break function (NC)
IFBR 11N37T1/S14L-9	connector M12	NPN break function (NC)
IFBR 11P17T1/L-9	cable PVC, 2 m	PNP make function (NO)
IFBR 11P17T1/S14L-9	connector M12	PNP make function (NO)
IFBR 11P37T1/L-9	cable PVC, 2 m	PNP break function (NC)
IFBR 11P37T1/S14L-9	connector M12	PNP break function (NC)



Sn = 6 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C

general data

mounting type	non-flush
special type	hygienic design
nominal sensing distance Sn	6 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab EHEDG REGULATION (EC) 1935/2004 REGULATION (EC) 2023/2006 REGULATION (EU) 1282/2011 FDA 21 CFR § 175.300 FDA 21 CFR § 177.2600 FCN 742

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	11 mm

cable PVC, 2 m

housing length	54 mm
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connector M12

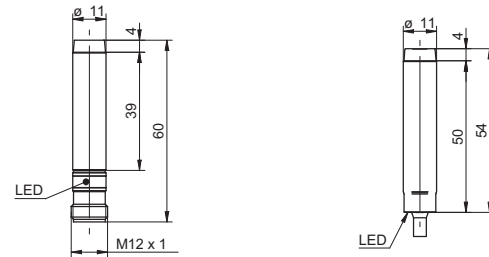
housing length	60 mm
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ambient conditions

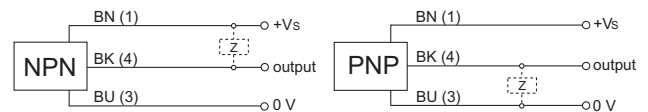
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+



dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP

additional cable connectors and field wireable connectors: see accessories

Accessories

HI11-1H	Mounting for sensors in hygienic design Ø 11 mm
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for details: see accessories section

order reference	connection types	output circuit
IFBR 11N13T1/L-9	cable PVC, 2 m	NPN make function (NO)
IFBR 11N13T1/S14L-9	connector M12	NPN make function (NO)
IFBR 11N33T1/L-9	cable PVC, 2 m	NPN break function (NC)
IFBR 11N33T1/S14L-9	connector M12	NPN break function (NC)
IFBR 11P13T1/L-9	cable PVC, 2 m	PNP make function (NO)
IFBR 11P13T1/S14L-9	connector M12	PNP make function (NO)
IFBR 11P33T1/L-9	cable PVC, 2 m	PNP break function (NC)
IFBR 11P33T1/S14L-9	connector M12	PNP break function (NC)


Sn = 8 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C

general data

mounting type	quasi-flush
special type	hygienic design
nominal sensing distance Sn	8 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab EHEDG REGULATION (EC) 1935/2004 REGULATION (EC) 2023/2006 REGULATION (EU) 1282/2011 FDA 21 CFR § 175.300 FDA 21 CFR § 177.2600 FCN 742

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	17 mm

cable PVC, 2 m

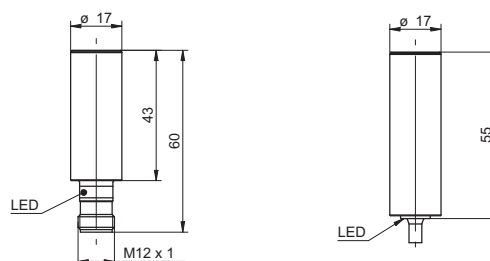
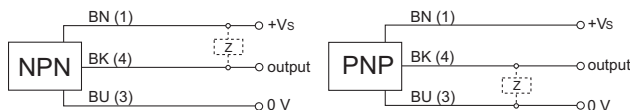
housing length	55 mm
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connector M12

housing length	60 mm
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ambient conditions

operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+


dimension drawings

connection diagrams

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP

additional cable connectors and field wireable connectors: see accessories

Accessories

HI17-1H	Mounting for sensors in hygienic design Ø 17 mm
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for details: see accessories section

order reference	connection types	output circuit
IFBR 17N17T1/L-9	cable PVC, 2 m	NPN make function (NO)
IFBR 17N17T1/S14L-9	connector M12	NPN make function (NO)
IFBR 17N37T1/L-9	cable PVC, 2 m	NPN break function (NC)
IFBR 17N37T1/S14L-9	connector M12	NPN break function (NC)
IFBR 17P17T1/L-9	cable PVC, 2 m	PNP make function (NO)
IFBR 17P17T1/S14L-9	connector M12	PNP make function (NO)
IFBR 17P37T1/L-9	cable PVC, 2 m	PNP break function (NC)
IFBR 17P37T1/S14L-9	connector M12	PNP break function (NC)



Sn = 12 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C

general data

mounting type	non-flush
special type	hygienic design
nominal sensing distance Sn	12 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab EHEDG REGULATION (EC) 1935/2004 REGULATION (EC) 2023/2006 REGULATION (EU) 1282/2011 FDA 21 CFR § 175.300 FDA 21 CFR § 177.2600 FCN 742

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	17 mm

cable PVC, 2 m

housing length	55 mm
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connector M12

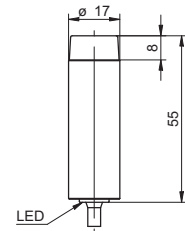
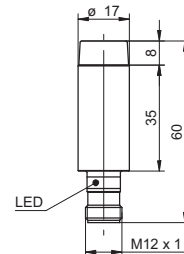
housing length	60 mm
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ambient conditions

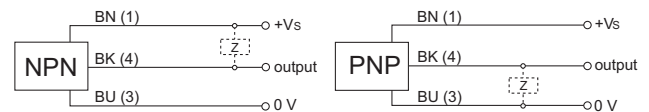
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+



dimension drawings



connection diagrams



connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP

additional cable connectors and field wireable connectors: see accessories

Accessories

HI17-1H	Mounting for sensors in hygienic design Ø 17 mm
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for details: see accessories section

order reference	connection types	output circuit
IFBR 17N13T1/L-9	cable PVC, 2 m	NPN make function (NO)
IFBR 17N13T1/S14L-9	connector M12	NPN make function (NO)
IFBR 17N33T1/L-9	cable PVC, 2 m	NPN break function (NC)
IFBR 17N33T1/S14L-9	connector M12	NPN break function (NC)
IFBR 17P13T1/L-9	cable PVC, 2 m	PNP make function (NO)
IFBR 17P13T1/S14L-9	connector M12	PNP make function (NO)
IFBR 17P33T1/L-9	cable PVC, 2 m	PNP break function (NC)
IFBR 17P33T1/S14L-9	connector M12	PNP break function (NC)


Sn = 3 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C


general data

mounting type	non-flush
special type	Outdoor design Washdown design
nominal sensing distance Sn	3 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab

electrical data

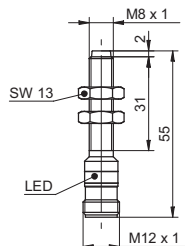
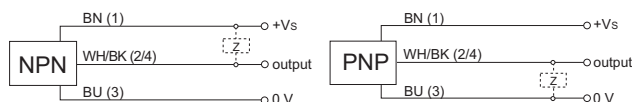
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	8 mm
housing length	55 mm
connection types	connector M12

ambient conditions

operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawing

connection diagrams


* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

order reference
output circuit

IFRR 08N13T1/S14L-9	NPN make function (NO)
IFRR 08N33T1/S14L-9	NPN break function (NC)
IFRR 08P13T1/S14L-9	PNP make function (NO)
IFRR 08P33T1/S14L-9	PNP break function (NC)



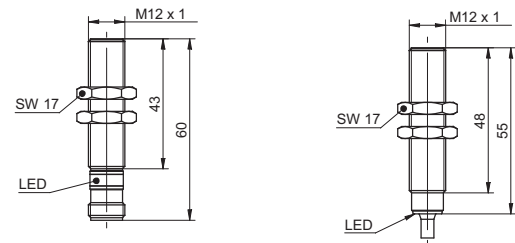
Sn = 4 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C

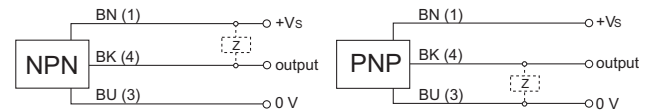
general data	
mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	12 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)



dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

order reference	special type	connection types	output circuit
IFRR 12N17T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 12N17T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 12N37T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 12N37T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 12P17T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 12P17T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 12P37T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 12P37T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)


Sn = 6 mm

- robust steel housing
- high switching frequency
- M12 x 1 quick disconnect

general data

mounting type	non-flush
nominal sensing distance Sn	6 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	12 mm

cable PVC, 2 m

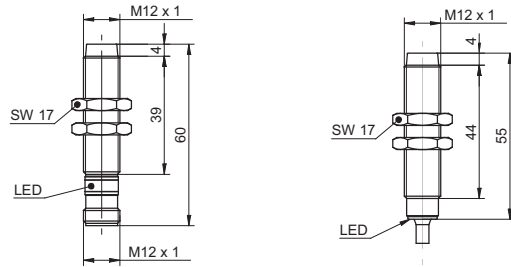
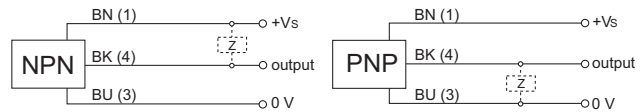
housing length	55 mm
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connector M12

housing length	60 mm
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ambient conditions

operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings

connection diagrams


* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

order reference	special type	connection types	output circuit
IFRR 12N13T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 12N13T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 12N33T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 12N33T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 12P13T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 12P13T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 12P33T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 12P33T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)

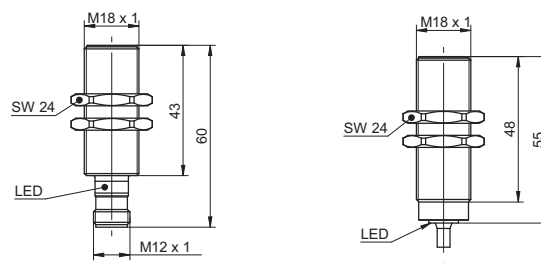


Sn = 8 mm

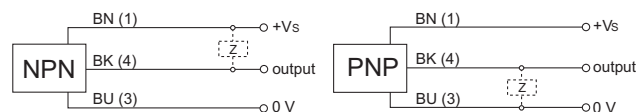
- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C

general data	
mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	18 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)

for details: see accessories section

order reference	special type	connection types	output circuit
IFRR 18N17T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 18N17T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 18N37T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 18N37T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 18P17T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 18P17T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 18P37T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 18P37T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)


Sn = 12 mm

- robust steel housing
- high switching frequency
- M12 x 1 quick disconnect

general data

mounting type	non-flush
nominal sensing distance Sn	12 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	18 mm

cable PVC, 2 m

housing length	55 mm
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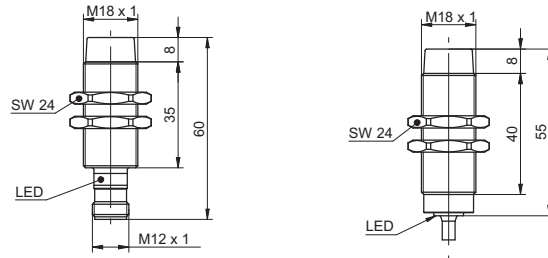
connector M12

housing length	60 mm
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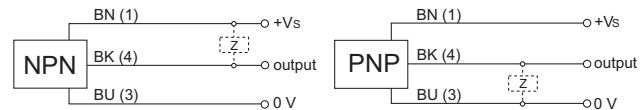
ambient conditions

operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)

for details: see accessories section

order reference	special type	connection types	output circuit
IFRR 18N13T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 18N13T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 18N33T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 18N33T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 18P13T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 18P13T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 18P33T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 18P33T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)



Sn = 3 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C

general data	
mounting type	non-flush
special type	Outdoor design Washdown design
nominal sensing distance Sn	3 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab

electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

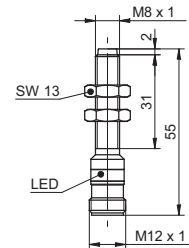
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	8 mm
housing length	55 mm
connection types	connector M12

ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

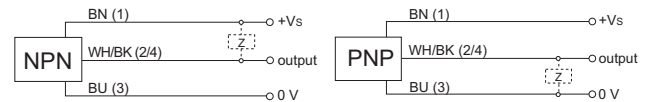
order reference	output circuit
IFRR 08N13T1/S14L-9	NPN make function (NO)
IFRR 08N33T1/S14L-9	NPN break function (NC)
IFRR 08P13T1/S14L-9	PNP make function (NO)
IFRR 08P33T1/S14L-9	PNP break function (NC)



dimension drawing



connection diagrams



* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories



Sn = 4 mm

- DNV-GL certification
- robust steel housing



general data

mounting type	flush
special type	Marine
nominal sensing distance Sn	4 mm
temperature drift	± 20 %
hysteresis	2 ... 18 % of Sr
output indicator	3 port LED red
correction factor typ.	mild steel 100 %, stainless steel 70 %, aluminum 35 %
approvals/certificates	DNV GL

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	6 ... 36 VDC
normal operating voltage	24 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

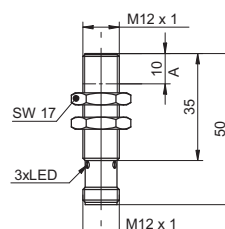
mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	stainless steel 1.4404 (V4A)
dimension	12 mm
housing length	50 mm
connection types	connector M12
tightening torque max.	20 Nm (A: 12 Nm)

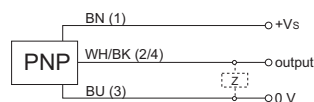
ambient conditions

operating temperature	-40 ... +75 °C
protection class	IP 67

dimension drawing



connection diagram



remarks

for correct installation refer to "mounting instructions"

connectors and mating connectors

ESG 34SH0200 Connector M12, 3 pin, straight, 2 m

ESW 33SH0200 Connector M12, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720 Sensofix series 12 round

11163237 Adapter for pulse stretching M12

for details: see accessories section

order reference

output circuit

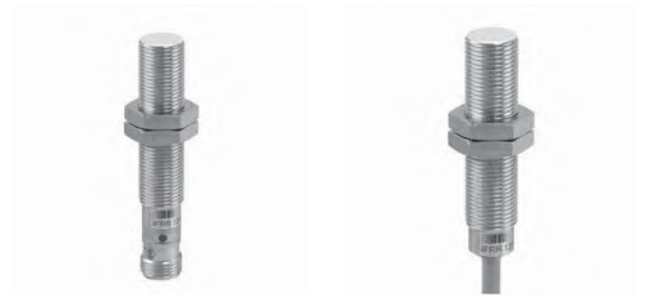
IR12.P04S-11158411	PNP break function (NC)
IR12.P04S-11158406	PNP make function (NO)



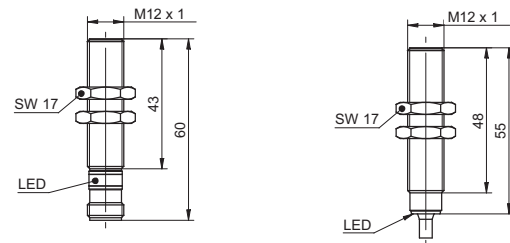
Sn = 4 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C

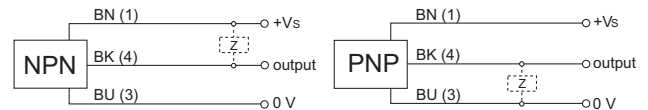
general data	
mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab
electrical data	
switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	12 mm
cable PVC, 2 m	
housing length	55 mm
connector M12	
housing length	60 mm
ambient conditions	
operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)



dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

order reference	special type	connection types	output circuit
IFRR 12N17T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 12N17T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 12N37T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 12N37T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 12P17T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 12P17T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 12P37T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 12P37T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)


Sn = 6 mm

- robust steel housing
- high switching frequency
- M12 x 1 quick disconnect

general data

mounting type	non-flush
nominal sensing distance Sn	6 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red

electrical data

switching frequency	< 1 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA

short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	12 mm

cable PUR 3 x 0,25, 2 m

housing length	55 mm
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cable PVC, 2 m

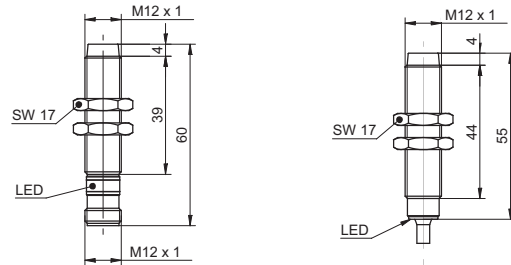
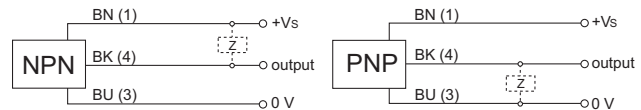
housing length	55 mm
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connector M12

housing length	60 mm
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ambient conditions

operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)


dimension drawings

connection diagrams


* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

order reference	special type	connection types	output circuit	approvals/certificates
IFRR 12N13T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)	Ecolab
IFRR 12N13T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	NPN make function (NO)	-
IFRR 12N13T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)	Ecolab
IFRR 12N33T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)	Ecolab
IFRR 12N33T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	NPN break function (NC)	-
IFRR 12N33T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)	Ecolab
IFRR 12P13T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)	Ecolab
IFRR 12P13T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	PNP make function (NO)	-
IFRR 12P13T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)	Ecolab
IFRR 12P33T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)	Ecolab
IFRR 12P33T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	PNP break function (NC)	-
IFRR 12P33T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)	Ecolab


Sn = 6 mm

- operating temperature -40 ... +80 °C

general data

mounting type	non-flush
special type	Outdoor design
nominal sensing distance Sn	6 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm

cable PUR 3 x 0,25, 2 m

housing length	50 mm
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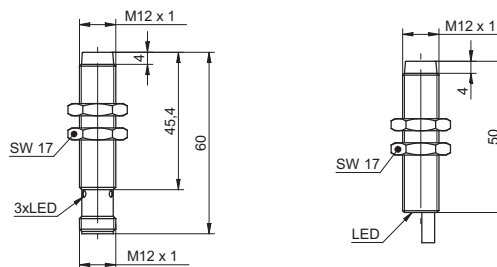
connector M12

housing length	60 mm
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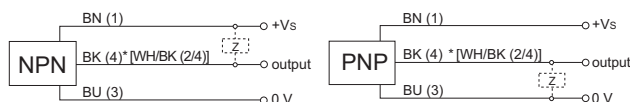
ambient conditions

operating temperature	-40 ... +80 °C
protection class	IP 67

dimension drawings



connection diagrams



connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12

for details: see accessories section

order reference	connection types	output circuit
IFRM 12N13T1/PL	cable PUR 3 x 0,25, 2 m	NPN make function (NO)
IFRM 12N13T1/S14L	connector M12	NPN make function (NO)
IFRM 12N33T1/PL	cable PUR 3 x 0,25, 2 m	NPN break function (NC)
IFRM 12N33T1/S14L	connector M12	NPN break function (NC)
IFRM 12P13T1/PL	cable PUR 3 x 0,25, 2 m	PNP make function (NO)
IFRM 12P13T1/S14L	connector M12	PNP make function (NO)
IFRM 12P33T1/PL	cable PUR 3 x 0,25, 2 m	PNP break function (NC)
IFRM 12P33T1/S14L	connector M12	PNP break function (NC)



Sn = 8 mm

- robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +80°C

general data

mounting type	quasi-flush
nominal sensing distance Sn	8 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red
approvals/certificates	Ecolab

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	18 mm

cable PVC, 2 m

housing length	55 mm
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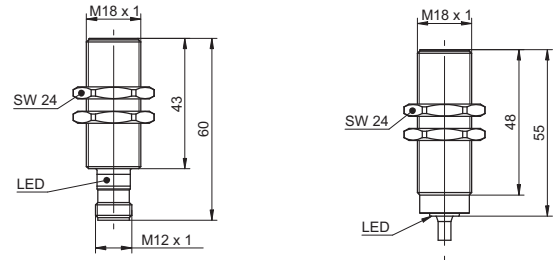
connector M12

housing length	60 mm
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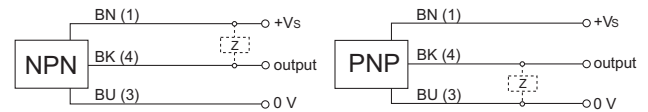
ambient conditions

operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings



connection diagrams



* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)

for details: see accessories section

order reference	special type	connection types	output circuit
IFRR 18N17T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)
IFRR 18N17T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)
IFRR 18N37T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)
IFRR 18N37T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)
IFRR 18P17T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)
IFRR 18P17T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)
IFRR 18P37T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)
IFRR 18P37T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)

**Sn = 10 mm**

- increased sensing distance
- operating temperature -40 ... +80 °C

general data

mounting type	flush
special type	Outdoor design
nominal sensing distance Sn	10 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red

electrical data

switching frequency	< 400 Hz
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	24 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm

cable PUR 3 x 0,25, 2 m

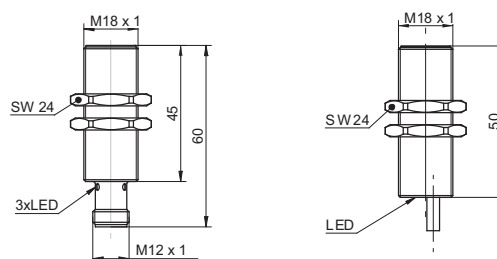
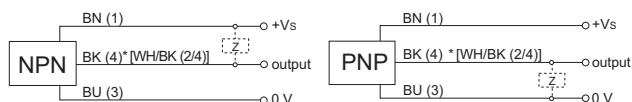
housing length	50 mm
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connector M12

housing length	60 mm
----------------	-------

ambient conditions

operating temperature	-40 ... +80 °C
protection class	IP 67

dimension drawings**connection diagrams****connectors and mating connectors**

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

for details: see accessories section

order reference	connection types	output circuit
IFRM 18N17M1/PL	cable PUR 3 x 0,25, 2 m	NPN make function (NO)
IFRM 18N17M1/S14L	connector M12	NPN make function (NO)
IFRM 18N37M1/PL	cable PUR 3 x 0,25, 2 m	NPN break function (NC)
IFRM 18N37M1/S14L	connector M12	NPN break function (NC)
IFRM 18P17M1/PL	cable PUR 3 x 0,25, 2 m	PNP make function (NO)
IFRM 18P17M1/S14L	connector M12	PNP make function (NO)
IFRM 18P37M1/PL	cable PUR 3 x 0,25, 2 m	PNP break function (NC)
IFRM 18P37M1/S14L	connector M12	PNP break function (NC)



Sn = 10 mm

- DNV-GL certification
- robust steel housing



general data

mounting type	flush
special type	Marine
nominal sensing distance Sn	10 mm
temperature drift	± 20 %
hysteresis	2 ... 18 % of Sr
output indicator	3 port LED red
correction factor typ.	mild steel 100 %, stainless steel 95 %, aluminum 50 %
approvals/certificates	DNV GL

electrical data

switching frequency	< 800 Hz
voltage supply range +Vs	6 ... 36 VDC
normal operating voltage	24 VDC
current consumption max. (no load)	12 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

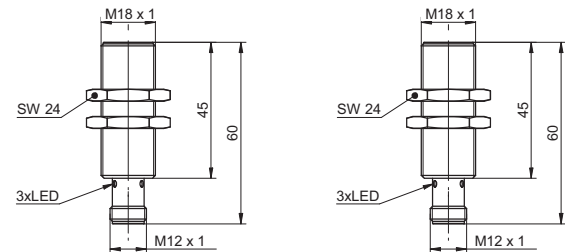
mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated, chromium plated
dimension	18 mm
housing length	60 mm
tightening torque max.	40 Nm

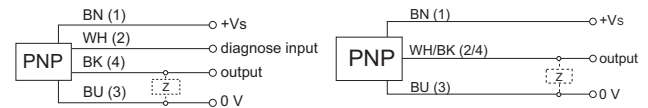
ambient conditions

operating temperature	-40 ... +75 °C
protection class	IP 67

dimension drawings



connection diagrams



connectors and mating connectors

ESG 34SH0200 Connector M12, 3 pin, straight, 2 m

ESW 33SH0200 Connector M12, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

for details: see accessories section

order reference

connection types

IR18.P10S-11174188	connector M12 5 pin
IR18.P10S-11158437	connector M12 4 pin


Sn = 12 mm

- robust steel housing
- high switching frequency
- M12 x 1 quick disconnect

general data

mounting type	non-flush
nominal sensing distance Sn	12 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
output current (at cleaning temperature)	< 100 mA

short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A); LSR
dimension	18 mm

cable PUR 3 x 0,25, 2 m

housing length	55 mm
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cable PVC, 2 m

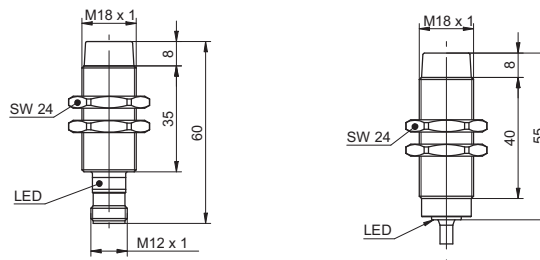
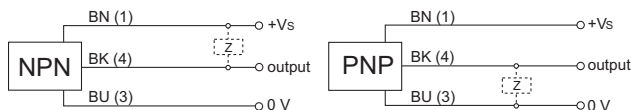
housing length	55 mm
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connector M12

housing length	60 mm
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ambient conditions

operating temperature	-40 ... +80 °C
cleaning temperature	80 ... +100 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

dimension drawings

connection diagrams


* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESG 34AB0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESW 33AB0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)

for details: see accessories section

order reference	special type	connection types	output circuit	approvals/certificates
IFRR 18N13T1/L-9	Washdown design	cable PVC, 2 m	NPN make function (NO)	Ecolab
IFRR 18N13T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	NPN make function (NO)	-
IFRR 18N13T1/S14L-9	Outdoor design Washdown design	connector M12	NPN make function (NO)	Ecolab
IFRR 18N33T1/L-9	Washdown design	cable PVC, 2 m	NPN break function (NC)	Ecolab
IFRR 18N33T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	NPN break function (NC)	-
IFRR 18N33T1/S14L-9	Outdoor design Washdown design	connector M12	NPN break function (NC)	Ecolab
IFRR 18P13T1/L-9	Washdown design	cable PVC, 2 m	PNP make function (NO)	Ecolab
IFRR 18P13T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	PNP make function (NO)	-
IFRR 18P13T1/S14L-9	Outdoor design Washdown design	connector M12	PNP make function (NO)	Ecolab
IFRR 18P33T1/L-9	Washdown design	cable PVC, 2 m	PNP break function (NC)	Ecolab
IFRR 18P33T1/PL-9	Outdoor design	cable PUR 3 x 0,25, 2 m	PNP break function (NC)	-
IFRR 18P33T1/S14L-9	Outdoor design Washdown design	connector M12	PNP break function (NC)	Ecolab


Sn = 12 mm

- operating temperature -40 ... +80 °C

general data

mounting type	non-flush
special type	Outdoor design
nominal sensing distance Sn	12 mm
hysteresis	2 ... 15 % of Sr
output indicator	LED red

electrical data

switching frequency	< 500 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm

cable PUR 3 x 0,25, 2 m

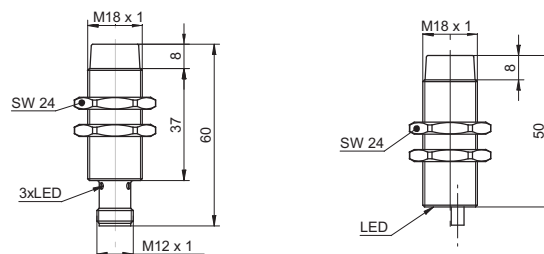
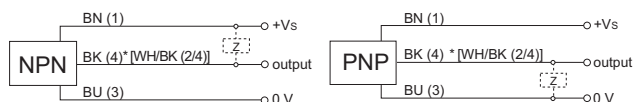
housing length	50 mm
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connector M12

housing length	60 mm
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ambient conditions

operating temperature	-40 ... +80 °C
protection class	IP 67

dimension drawings

connection diagrams


* .../S14L pin 2 & 4 electrically connected

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12

for details: see accessories section

order reference	connection types	output circuit
IFRM 18N13T1/PL	cable PUR 3 x 0,25, 2 m	NPN make function (NO)
IFRM 18N13T1/S14L	connector M12	NPN make function (NO)
IFRM 18N33T1/PL	cable PUR 3 x 0,25, 2 m	NPN break function (NC)
IFRM 18N33T1/S14L	connector M12	NPN break function (NC)
IFRM 18P13T1/PL	cable PUR 3 x 0,25, 2 m	PNP make function (NO)
IFRM 18P13T1/S14L	connector M12	PNP make function (NO)
IFRM 18P33T1/PL	cable PUR 3 x 0,25, 2 m	PNP break function (NC)
IFRM 18P33T1/S14L	connector M12	PNP break function (NC)

**Sn = 2 mm**

- full stainless steel housing 1.4404 (V4A)
- protection class IP 69K

**general data**

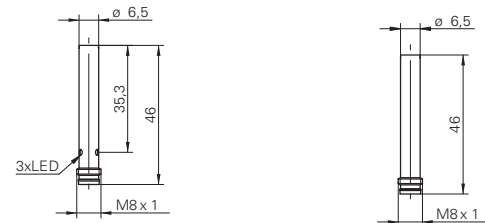
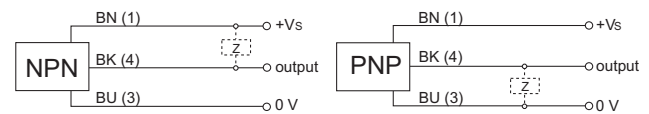
mounting type	quasi-flush
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 150 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	20 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
material (sensing face)	stainless steel 1.4404 (V4A)
housing material	stainless steel 1.4404 (V4A)
pressure static	< 20 bar
dimension	6,5 mm
housing length	46 mm
connection types	connector M8

dimension drawings**connection diagrams****remarks**

for correct installation refer to "mounting instructions"

connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 32SF0500	Connector M8, 3 pin, straight, 5 m, V4A-PVC

additional cable connectors and field wireable connectors: see accessories

Accessories

10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11163236	Adapter for pulse stretching M8

for details: see accessories section

order reference	special type	output circuit	operating temperature	protection class	output current	output indicator
IFRD 06N17A1/S35L	full metal housing (<i>DuroProx</i>)	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 06N17T1/S35	full metal housing (<i>DuroProx</i>) high temperature	NPN make function (NO)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 06N37A1/S35L	full metal housing (<i>DuroProx</i>)	NPN break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 06N37T1/S35	full metal housing (<i>DuroProx</i>) high temperature	NPN break function (NC)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 06P17A1/S35L	full metal housing (<i>DuroProx</i>)	PNP make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 06P17T1/S35	full metal housing (<i>DuroProx</i>) high temperature	PNP make function (NO)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 06P37A1/S35L	full metal housing (<i>DuroProx</i>)	PNP break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 06P37T1/S35	full metal housing (<i>DuroProx</i>) high temperature	PNP break function (NC)	-25 ... +100 °C	IP 69K	< 100 mA	-


Sn = 2 mm

- full stainless steel housing 1.4404 (V4A)
- protection class IP 69K


general data

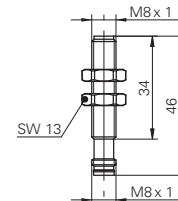
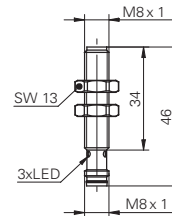
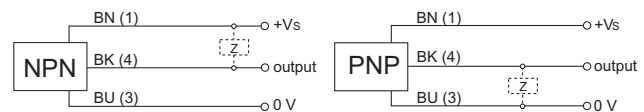
mounting type	quasi-flush
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 150 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	20 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	stainless steel 1.4404 (V4A)
housing material	stainless steel 1.4404 (V4A)
pressure static	< 20 bar
dimension	8 mm
housing length	46 mm
connection types	connector M8

dimension drawings

connection diagrams

remarks

for correct installation refer to "mounting instructions"

connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 32SF0500	Connector M8, 3 pin, straight, 5 m, V4A-PVC

additional cable connectors and field wireable connectors: see accessories

Accessories

10151719	Sensofix series 08 round
11163236	Adapter for pulse stretching M8

for details: see accessories section

order reference	special type	output circuit	operating temperature	protection class	output current	output indicator
IFRD 08N17A1/S35L	full metal housing (<i>DuroProx</i>)	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 08N17T1/S35	full metal housing (<i>DuroProx</i>) high temperature	NPN make function (NO)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 08N37A1/S35L	full metal housing (<i>DuroProx</i>)	NPN break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 08N37T1/S35	full metal housing (<i>DuroProx</i>) high temperature	NPN break function (NC)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 08P17A1/S35L	full metal housing (<i>DuroProx</i>)	PNP make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 08P17T1/S35	full metal housing (<i>DuroProx</i>) high temperature	PNP make function (NO)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 08P37A1/S35L	full metal housing (<i>DuroProx</i>)	PNP break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 08P37T1/S35	full metal housing (<i>DuroProx</i>) high temperature	PNP break function (NC)	-25 ... +100 °C	IP 69K	< 100 mA	-

**Sn = 4 mm**

- full stainless steel housing 1.4404 (V4A)
- protection class IP 69K



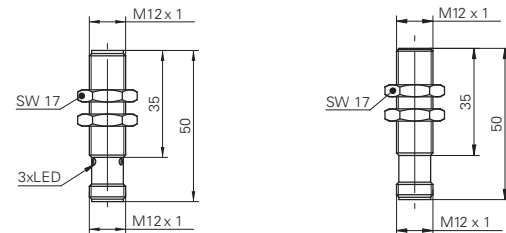
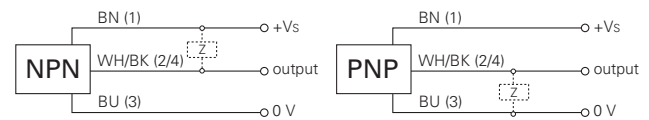
general data	
mounting type	quasi-flush
nominal sensing distance Sn	4 mm
hysteresis	2 ... 20 % of Sr
electrical data	
switching frequency	< 100 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	14 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
material (sensing face)	stainless steel 1.4404 (V4A)
housing material	stainless steel 1.4404 (V4A)
pressure static	< 20 bar
dimension	12 mm
housing length	50 mm
connection types	connector M12

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

10151720	Sensofix series 12 round
11163237	Adapter for pulse stretching M12
for details: see accessories section	

dimension drawings**connection diagrams****remarks**

for correct installation refer to "mounting instructions"

order reference	special type	output circuit	operating temperature	protection class	output current	output indicator
IFRD 12N17A3/S14L	full metal housing (<i>DuroProx</i>)	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 12N17T3/S14	full metal housing (<i>DuroProx</i>) high temperature	NPN make function (NO)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 12N37A3/S14L	full metal housing (<i>DuroProx</i>)	NPN break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 12N37T3/S14	full metal housing (<i>DuroProx</i>) high temperature	NPN break function (NC)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 12P17A3/S14L	full metal housing (<i>DuroProx</i>)	PNP make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 12P17T3/S14	full metal housing (<i>DuroProx</i>) high temperature	PNP make function (NO)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 12P37A3/S14L	full metal housing (<i>DuroProx</i>)	PNP break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 12P37T3/S14	full metal housing (<i>DuroProx</i>) high temperature	PNP break function (NC)	-25 ... +100 °C	IP 69K	< 100 mA	-


Sn = 6 mm

- full stainless steel housing 1.4404 (V4A)
- protection class IP 69K



general data

mounting type	quasi-flush
nominal sensing distance Sn	6 mm
hysteresis	2 ... 20 % of Sr

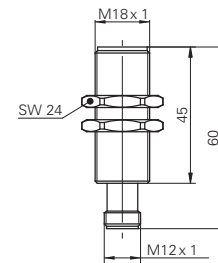
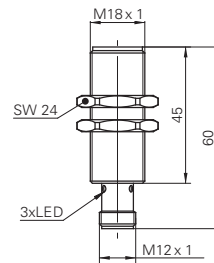
electrical data

switching frequency	< 100 Hz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	14 mA
voltage drop Vd	< 2 VDC
short circuit protection	yes
reverse polarity protection	yes

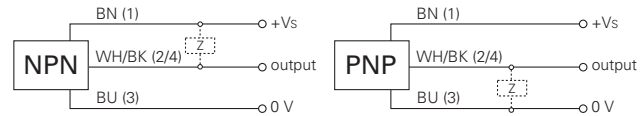
mechanical data

type	cylindrical threaded
material (sensing face)	stainless steel 1.4404 (V4A)
housing material	stainless steel 1.4404 (V4A)
pressure static	< 20 bar
dimension	18 mm
housing length	60 mm
connection types	connector M12

dimension drawings



connection diagrams



remarks

for correct installation refer to "mounting instructions"

connectors and mating connectors

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference	special type	output circuit	operating temperature	protection class	output current	output indicator
IFRD 18N17A3/S14L	full metal housing (<i>DuroProx</i>)	NPN make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 18N17T3/S14	full metal housing (<i>DuroProx</i>) high temperature	NPN make function (NO)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 18N37A3/S14L	full metal housing (<i>DuroProx</i>)	NPN break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 18N37T3/S14	full metal housing (<i>DuroProx</i>) high temperature	NPN break function (NC)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 18P17A3/S14L	full metal housing (<i>DuroProx</i>)	PNP make function (NO)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 18P17T3/S14	full metal housing (<i>DuroProx</i>) high temperature	PNP make function (NO)	-25 ... +100 °C	IP 69K	< 100 mA	-
IFRD 18P37A3/S14L	full metal housing (<i>DuroProx</i>)	PNP break function (NC)	-25 ... +75 °C	IP 68/67 (sensing face/sensor)	< 200 mA	3 port LED red
IFRD 18P37T3/S14	full metal housing (<i>DuroProx</i>) high temperature	PNP break function (NC)	-25 ... +100 °C	IP 69K	< 100 mA	-



Sn = 2 mm

- with integral electronics up to +100 °C
- FEP cable

**general data**

mounting type	flush
special type	high temperature
nominal sensing distance Sn	2 mm
temperature drift	± 10 % (-25 ... +75 °C) - 10 % / + 15 % (-25 ... +100 °C)
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

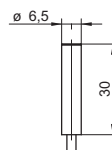
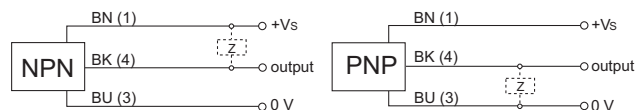
type	cylindrical smooth
material (sensing face)	PBT
housing material	stainless steel
dimension	6,5 mm
housing length	30 mm
connection types	cable FEP, 1 m

ambient conditions

operating temperature	-25 ... +100 °C
protection class	IP 67

Accessories

10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
for details: see accessories section	

dimension drawing**connection diagrams****order reference****output circuit**

IFRM 06N1707	NPN make function (NO)
IFRM 06P1707	PNP make function (NO)



Sn = 2 mm

- with integral electronics up to +100 °C
- very long housing



general data

mounting type	flush
special type	high temperature
nominal sensing distance Sn	2 mm
temperature drift	± 10 % (-25 ... +75 °C) - 10 % / + 15 % (-25 ... +100 °C)
hysteresis	3 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	12 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 3 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
housing length	50 mm
connection types	cable FEP, 1 m

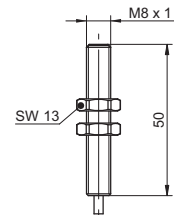
ambient conditions

operating temperature	-25 ... +100 °C
protection class	IP 67

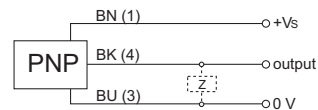
order reference

IFRM 08P17T4

dimension drawing



connection diagram





Sn = 2 mm / 4 mm

- with integral electronics up to +100°C
- FEP cable



general data

mounting type	flush
special type	high temperature
hysteresis	3 ... 20 % of Sr

electrical data

voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 3 VDC
output current	< 100 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
connection types	cable FEP, 1 m

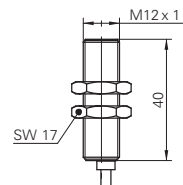
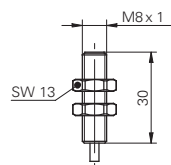
ambient conditions

operating temperature	-25 ... +100 °C
protection class	IP 67

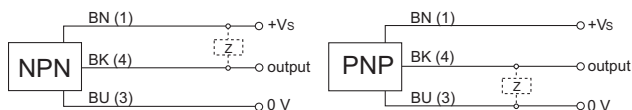
Accessories

10151720	Sensofix series 12 round
for details: see accessories section	

dimension drawings



connection diagrams



order reference	nominal sensing distance Sn	switching frequency	output circuit	dimension	housing material	housing length	temperature drift
IFRM 08N1707	2 mm	< 5 kHz	NPN make function (NO)	8 mm	stainless steel	30 mm	± 10 % (-25 ... +75 °C) - 10 % / + 15 % (-25 ... +100 °C)
IFRM 08P1707	2 mm	< 5 kHz	PNP make function (NO)	8 mm	stainless steel	30 mm	± 10 % (-25 ... +75 °C) - 10 % / + 15 % (-25 ... +100 °C)
IFRM 08P3707	2 mm	< 5 kHz	PNP break function (NC)	8 mm	stainless steel	30 mm	± 10 % (-25 ... +75 °C) - 10 % / + 15 % (-25 ... +100 °C)
IFRM 12N1707	4 mm	< 2 kHz	NPN make function (NO)	12 mm	brass nickel plated	40 mm	-
IFRM 12P1707	4 mm	< 2 kHz	PNP make function (NO)	12 mm	brass nickel plated	40 mm	-



Sn = 1,5 mm

- probe designed for use up to +180°C
- active face made of LCP
- detached cable amplifier



general data

mounting type	flush
special type	high temperature
nominal sensing distance Sn	1,5 mm
hysteresis	2 ... 25 % of Sr

electrical data

switching frequency	< 4 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel
dimension	8 mm
housing length	30 mm
connection types	cable, 2 m

ambient conditions

operating temperature	-25 ... +180 °C
protection class	IP 67

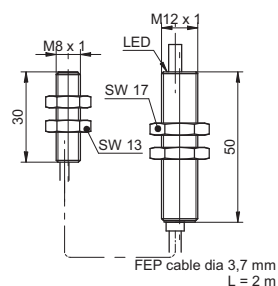
inline amplifier

operating temperature	-25 ... +75 °C
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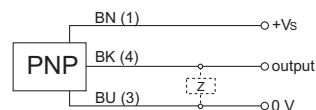
Accessories

10151719	Sensofix series 08 round
for details: see accessories section	

dimension drawing



connection diagram



order reference

output circuit

IFRH 08P1501/L	PNP make function (NO)
IFRH 08P3501/L	PNP break function (NC)



Sn = 2 mm / 5 mm

- probe designed for use up to +180°C
- active face made of LCP
- detached cable amplifier



general data

mounting type	flush
special type	high temperature
hysteresis	2 ... 20 % of Sr

electrical data

voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
connection types	cable, 2 m

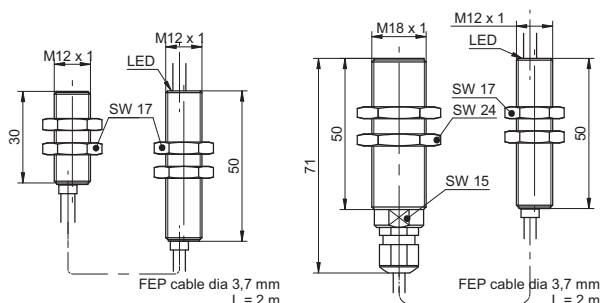
ambient conditions

operating temperature	-25 ... +180 °C
protection class	IP 67

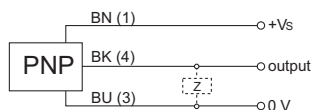
inline amplifier

operating temperature	-25 ... +75 °C
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dimension drawings



connection diagram



Accessories

10151720	Sensofix series 12 round
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)

for details: see accessories section

order reference	nominal sensing distance Sn	switching frequency	output circuit	dimension	housing material	housing length
IFRH 12P1501/L	2 mm	< 2 kHz	PNP make function (NO)	12 mm	brass nickel plated	30 mm
IFRH 12P3501/L	2 mm	< 2 kHz	PNP break function (NC)	12 mm	brass nickel plated	30 mm
IFRH 18P1501/L	5 mm	< 1 kHz	PNP make function (NO)	18 mm	stainless steel	71 mm
IFRH 18P3501/L	5 mm	< 1 kHz	PNP break function (NC)	18 mm	stainless steel	71 mm



Sn = 2 mm / 5 mm

- PTFE coated sensing face
- housing made of chromium plated brass
- resist welding spark induced damage

general data

mounting type	flush
special type	welding and magnetic noise
hysteresis	3 ... 20 % of Sr

electrical data

voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 1 VDC
output current	< 250 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PTFE coated
housing material	brass chromium plated
connection types	connector M12

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

connectors and mating connectors

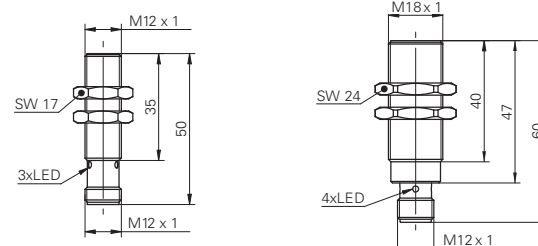
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

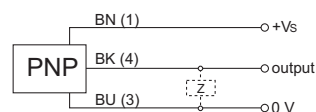
10151720	Sensofix series 12 round
10151658	Sensofix series 18
11163237	Adapter for pulse stretching M12

for details: see accessories section

dimension drawings



connection diagram



order reference	nominal sensing distance Sn	switching frequency	dimension	housing length	output indicator
IFRW 12P1501/S14L	2 mm	< 1 kHz	12 mm	50 mm	3 port LED red
IFRW 18P1501/S14L	5 mm	< 500 Hz	18 mm	60 mm	4 port LED red

**Sn = 2 mm**

- zirconium oxide ZrO_2 sensing face
- 500 bar/7000 psi pressure rating
- Sensing face sealed to IP 68

general data

mounting type	flush
special type	high pressure
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr

electrical data

switching frequency	< 5 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	ceramic
housing material	stainless steel
peak pressure	1000 bar
pressure static	< 500 bar
pressure dynamic	< 350 bar
dimension	12 mm
connection types	connector M12

ambient conditions

operating temperature	-25 ... +80 °C
protection class	IP 68/67 (sensing face/sensor)

connectors and mating connectors

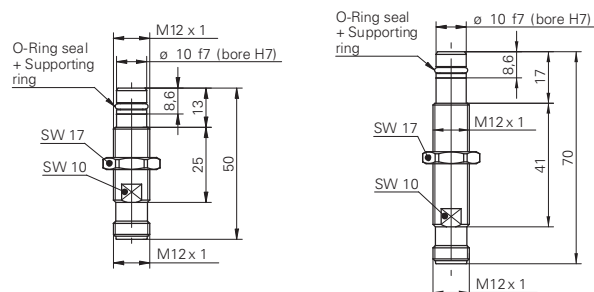
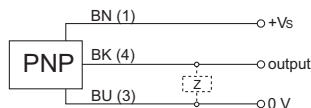
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories

11163237	Adapter for pulse stretching M12
for details: see accessories section	

order reference**housing length**

IFRP 12P1501/S14	50 mm
IFRP 12P1504/S14	70 mm

**dimension drawings****connection diagram**



Sn = 2 mm

- zirconium oxide ZrO_2 sensing face
- 500 bar/7000 psi pressure rating
- sensing face sealed to IP 68

general data	
mounting type	flush
special type	high pressure
nominal sensing distance Sn	2 mm
hysteresis	2 ... 20 % of Sr

electrical data	
switching frequency	< 3 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	12 mA
output circuit	PNP make function (NO)
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

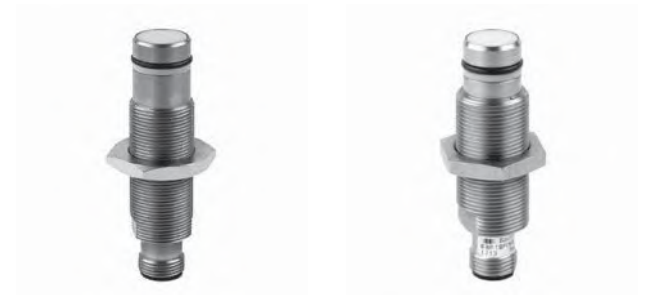
mechanical data	
type	cylindrical threaded
material (sensing face)	ceramic
housing material	stainless steel
peak pressure	1000 bar
pressure static	< 500 bar
pressure dynamic	< 350 bar
housing length	60 mm
connection types	connector M12

ambient conditions	
operating temperature	-25 ... +80 °C
protection class	IP 68/67 (sensing face/sensor)

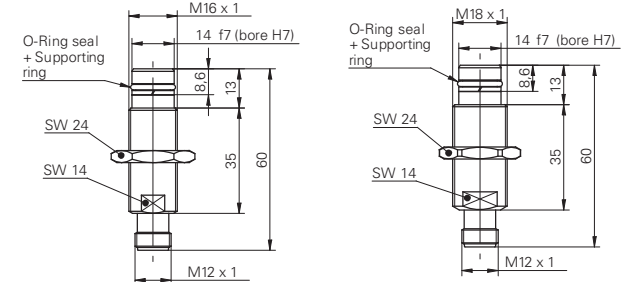
connectors and mating connectors	
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

Accessories	
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
11163237	Adapter for pulse stretching M12
for details: see accessories section	

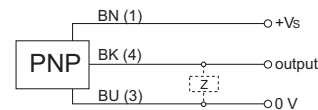
order reference	dimension
IFRP 16P1501/S14	16 mm
IFRP 18P1501/S14	18 mm



dimension drawings



connection diagram




Sn = 0,8 mm

- smallest NAMUR type sensors
- high switching frequency
- robust steel housing

general data

mounting type	flush
nominal sensing distance Sn	0,8 mm

electrical data

switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	6 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs

mechanical data

housing material	stainless steel
housing length	25 mm
connection types	cable, 2 m

ambient conditions

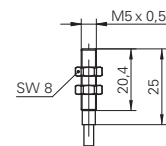
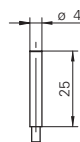
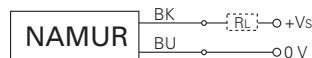
operating temperature	-25 ... +75 °C
protection class	IP 67

Accessories

10119345	Clamping nut for sensors Ø 4 mm
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for details: see accessories section

order reference	type	dimension
IFR 04.82.05	cylindrical smooth	4 mm
IFR 05.82.05	cylindrical threaded	5 mm


dimension drawings

connection diagram




Sn = 1,5 mm

- high switching frequency
- ATEX certification

general data	
mounting type	flush
nominal sensing distance Sn	1,5 mm
approvals/certificates	ATEX 1G
electrical data	
switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs
mechanical data	
type	cylindrical smooth
housing material	brass nickel plated
dimension	6,5 mm
housing length	25 mm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67
safe maximum values	
EC-type-examination Certificate	PTB 03 ATEX 2146
marking	II 1G Ex ia IIC T6 Ga
current Ii	< 37 mA
voltage Ui	< 13,5 VDC
power Pi	< 0,125 W
internal capacitance Ci	< 50 nF
internal inductance Li	< 0,2 mH
operating temperature Ta (temp. class T5)	-20 ... +60 °C
operating temperature Ta (temp. class T6)	-20 ... +40 °C

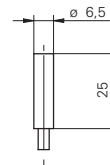
Accessories

10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
for details: see accessories section	

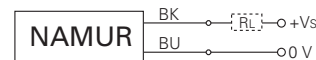
order reference	connection types
IFRM 06X9503	cable, 2 m
IFRM 06X9503/P	cable PUR 5 x 0,14, 2 m



dimension drawing



connection diagram



operating data according to EN 60947-5-6

+Vs = 8,2 V
 RL = 1 kΩ
 T = 20 °C
 Sn at 1,8 mA



for applications in hazardous areas



Sn = 1,5 mm / 2 mm

- shielded and unshielded versions
- high switching frequency
- ATEX certification

general data

approvals/certificates ATEX 1G

electrical data

switching frequency < 5 kHz
normal operating voltage 8,2 VDC
voltage supply range +Vs 5 ... 30 VDC
current consumption undamped > 4 mA
current consumption damped < 1 mA
current consumption max. (no load) 10 mA
output circuit NAMUR
residual ripple < 10 % Vs

mechanical data

type cylindrical threaded
dimension 8 mm

ambient conditions

operating temperature -25 ... +75 °C
protection class IP 67

safe maximum values

EC-type-examination Certificate PTB 03 ATEX 2146
marking II 1G Ex ia IIC T6 Ga
current Ii < 37 mA
voltage Ui < 13,5 VDC
power Pi < 0,125 W
internal capacitance Ci < 50 nF
internal inductance Li < 0,2 mH
operating temperature Ta (temp. class T5) -20 ... +60 °C
operating temperature Ta (temp. class T6) -20 ... +40 °C

connectors and mating connectors

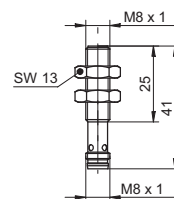
ESG 32SH0200 Connector M8, 3 pin, straight, 2 m
ESW 31SH0200 Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories

Accessories

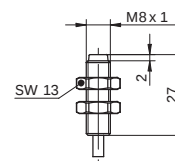
10151719 Sensofix series 08 round

for details: see accessories section

dimension drawings

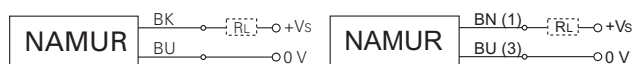


flush



non-flush

connection diagrams



operating data according to EN 60947-5-6

+Vs = 8,2 V
RL = 1 kΩ
T = 20 °C
Sn at 1,8 mA

 for applications in hazardous areas

remarks

available with connector S35

order reference	nominal sensing distance Sn	mounting type	housing material	housing length	connection types
IFRM 08X9103	2 mm	non-flush	brass nickel plated	27 mm	cable, 2 m
IFRM 08X9501/S35	1,5 mm	flush	stainless steel	50 mm	connector M8
IFRM 08X9503	1,5 mm	flush	brass nickel plated	25 mm	cable, 2 m
IFRM 08X9503/S35	1,5 mm	flush	stainless steel	41 mm	connector M8



Sn = 2 mm / 4 mm

- shielded and unshielded versions
- ATEX certification

general data

approvals/certificates ATEX 1G

electrical data

switching frequency < 2 kHz
normal operating voltage 8,2 VDC
voltage supply range +Vs 5 ... 30 VDC
current consumption undamped > 4 mA
current consumption damped < 1 mA
current consumption max. (no load) 10 mA
output circuit NAMUR
residual ripple < 10 % Vs

mechanical data

type cylindrical threaded
housing material brass nickel plated
dimension 12 mm
connection types cable, 2 m

ambient conditions

operating temperature -25 ... +75 °C
protection class IP 67

safe maximum values

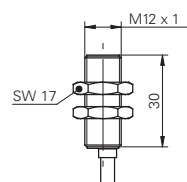
EC-type-examination Certificate PTB 03 ATEX 2146
marking II 1G Ex ia IIC T6 Ga
current Ii < 37 mA
voltage Ui < 13,5 VDC
power Pi < 0,125 W
internal capacitance Ci < 50 nF
internal inductance Li < 0,2 mH
operating temperature Ta (temp. class T5) -20 ... +60 °C
operating temperature Ta (temp. class T6) -20 ... +40 °C

Accessories

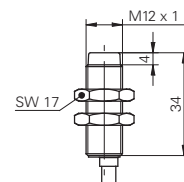
10151720 Sensofix series 12 round

for details: see accessories section

dimension drawings

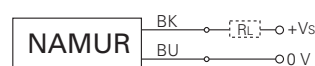


flush



non-flush

connection diagram



operating data according to EN 60947-5-6

+Vs = 8,2 V
RL = 1 kΩ
T = 20 °C
Sn at 1,8 mA



for applications in hazardous areas

order reference	nominal sensing distance Sn	mounting type	housing length
IFRM 12X9103	4 mm	non-flush	34 mm
IFRM 12X9503	2 mm	flush	30 mm



Sn = 4 mm

- high stability across entire temperature range
- ATEX Zulassung



general data

mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
approvals/certificates	ATEX 3D

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
housing length	30,4 mm
connection types	cabl, 2 m

ambient conditions

protection class	IP 67
------------------	-------

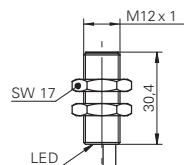
safe maximum values

marking	II 3D Ex tc IIIC T100°C Dc X
operating temperature Ta	-25 ... +65 °C

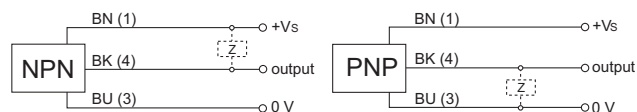
Accessories

10151720	Sensofix series 12 round
for details: see accessories section	

dimension drawing



connection diagrams



order reference

order reference	output circuit
IFRM 12N17X1/L	NPN make function (NO)
IFRM 12N37X1/L	NPN break function (NC)
IFRM 12P17X1/L	PNP make function (NO)
IFRM 12P37X1/L	PNP break function (NC)

**Sn = 4 mm**

- high stability across entire temperature range
- ATEX Zulassung

general data

mounting type	flush
nominal sensing distance Sn	4 mm
hysteresis	3 ... 20 % of Sr
output indicator	LED red
approvals/certificates	ATEX 3D

electrical data

switching frequency	< 2 kHz
voltage supply range +Vs	10 ... 30 VDC
current consumption max. (no load)	10 mA
voltage drop Vd	< 2 VDC
output current	< 200 mA
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	12 mm
housing length	40 mm
connection types	cable, 2 m

ambient conditions

protection class	IP 67
------------------	-------

safe maximum values

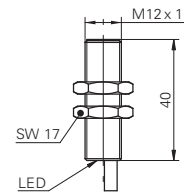
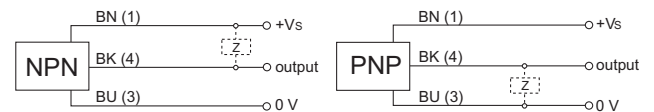
marking	II 3D Ex tc IIIC T100°C Dc X
operating temperature Ta	-25 ... +65 °C

Accessories

10151720	Sensofix series 12 round
for details: see accessories section	

order reference**output circuit**

IFRM 12N17X2/L	NPN make function (NO)
IFRM 12N37X2/L	NPN break function (NC)
IFRM 12P17X2/L	PNP make function (NO)
IFRM 12P37X2/L	PNP break function (NC)

**dimension drawing****connection diagrams**



- shielded and unshielded versions
- ATEX certification

general data

approvals/certificates ATEX 1G

electrical data

switching frequency < 1 kHz
 normal operating voltage 8,2 VDC
 voltage supply range +Vs 5 ... 30 VDC
 current consumption undamped > 4 mA
 current consumption damped < 1 mA
 current consumption max. (no load) 10 mA
 output circuit NAMUR
 residual ripple < 10 % Vs

mechanical data

type cylindrical threaded
 housing material brass nickel plated
 dimension 18 mm
 connection types cable, 2 m

ambient conditions

operating temperature -25 ... +75 °C
 protection class IP 67

safe maximum values

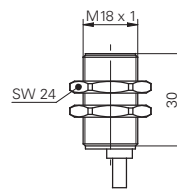
EC-type-examination Certificate PTB 03 ATEX 2146
 marking II 1G Ex ia IIC T6 Ga
 current Ii < 37 mA
 voltage Ui < 13,5 VDC
 power Pi < 0,125 W
 internal capacitance Ci < 50 nF
 internal inductance Li < 0,2 mH
 operating temperature Ta (temp. class T5) -20 ... +60 °C
 operating temperature Ta (temp. class T6) -20 ... +40 °C

Accessories

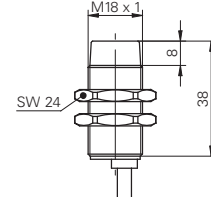
10151658 Sensofix series 18

for details: see accessories section

dimension drawings

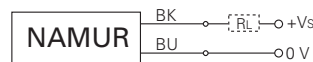


flush



non-flush

connection diagram



operating data according to EN 60947-5-6

+Vs = 8,2 V
 RL = 1 kΩ
 T = 20 °C
 Sn at 1,8 mA

for applications in hazardous areas

order reference	nominal sensing distance Sn	mounting type	housing length
IFRM 18X9103	8 mm	non-flush	38 mm
IFRM 18X9503	5 mm	flush	30 mm



- shielded mounting
- ATEX certification
- NAMUR sensor

general data

mounting type	flush
nominal sensing distance S_n	1,5 mm

electrical data

switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs

mechanical data

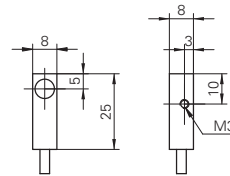
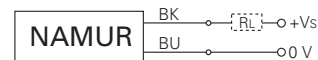
type	rectangular
housing material	brass nickel plated
dimension	8 mm
housing length	25 mm
connection types	cable, 2 m

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

order reference

IFF 08.82.05

**dimension drawing****connection diagram**

Sn = 1,5 mm

Inductive ATEX/NAMUR sensors

**Sn = 2 mm**

- non shielded mounting
- ATEX certification
- NAMUR sensor

general data

mounting type	non-flush
nominal sensing distance Sn	2 mm

electrical data

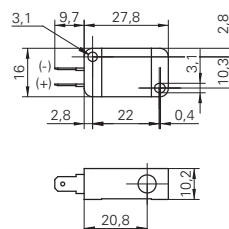
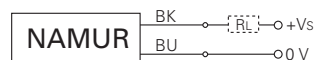
switching frequency	< 5 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs

mechanical data

type	rectangular
housing material	PBT
dimension	10 mm
housing length	27,8 mm
connection types	spade lug

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

order reference**IFFK 10E9101****dimension drawing****connection diagram****remarks**

spade plug 4,8 x 0,5 mm



Sn = 2 mm / 4 mm

- circuit board mountable
- pin-spacing 5 mm
- ATEX certification

general data

mounting type	flush
nominal sensing distance Sn	2 mm
approvals/certificates	ATEX 3G

electrical data

switching frequency	< 2 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs

mechanical data

type	cylindrical smooth
housing material	PBT
dimension	10 mm
housing length	6,6 mm
connection types	pins

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

safe maximum values

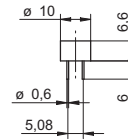
marking	II 3G Ex ic IIC T5 Gc X
current Ii	< 20 mA
voltage Ui	< 13 VDC
power Pi	< 0,065 W
internal capacitance Ci	< 100 nF
internal inductance Li	< 0,1 mH
operating temperature Ta (temp. class T5)	-20 ... +60 °C

order reference

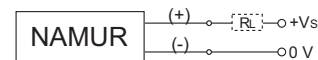
IFR 10.82E05



dimension drawing



connection diagram




Sn = 2 mm / 4 mm

- circuit board mountable
- pin-spacing 5 mm
- shielded and unshielded versions


electrical data

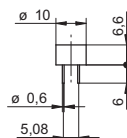
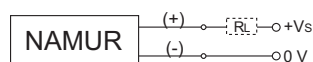
switching frequency	< 2 kHz
normal operating voltage	8,2 VDC
voltage supply range +Vs	5 ... 30 VDC
current consumption undamped	> 4 mA
current consumption damped	< 1 mA
current consumption max. (no load)	10 mA
output circuit	NAMUR
residual ripple	< 10 % Vs

mechanical data

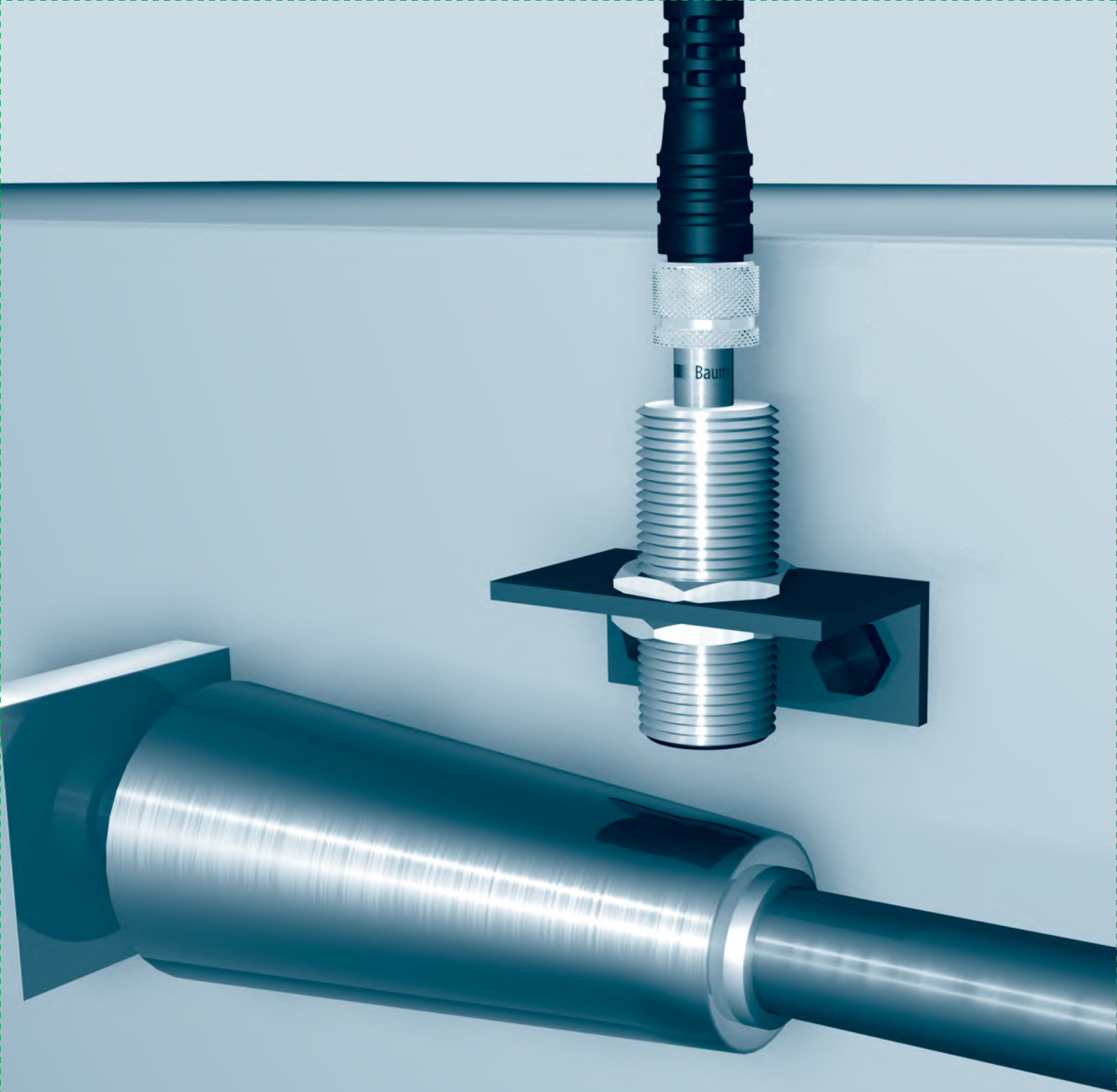
type	cylindrical smooth
housing material	PBT
dimension	10 mm
housing length	6,6 mm
connection types	pins

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing

connection diagram


order reference	nominal sensing distance Sn	mounting type
IFR 10.82.01	4 mm	non-flush
IFR 10.82.05	2 mm	flush





Inductive distance sensors AlphaProx®

Overview	Page 154
Function and applications	Page 160
Dynamic and static resolution	Page 161
Teach-in functions	Page 162
For factory automation	Page 164
With linearized characteristic curve	Page 185
Application specific distance sensors	Page 197

Distance sensors for factory automation – cylindrical designs

product family	IWRM 04	IR06.D03S	IR08.D02S	IR08.D03S	IR12.D04S	IR12.D06S	IR18.D05S
							
dimension	ø 4 mm	ø 6,5 mm	M8	M8	M12	M12	M18
measuring distance Sd	0 ... 1 mm	0 ... 3 mm	0 ... 2 mm	0 ... 3 mm	0 ... 4 mm	0 ... 6 mm	2 ... 5 mm
mounting type	quasi-flush	quasi-flush	flush	quasi-flush	flush	quasi-flush	flush
resolution min.	1 µm	1 µm	1 µm	1 µm	1 µm	5 µm	5 µm
repeat accuracy	5 µm	20 µm	20 µm	10 µm	10 µm	10 µm	15 µm
response time	0,5 ms	0,5 ms	0,5 ms	0,5 ms	1 ms	1 ms	2 ms
operating temperature	-10 ... +60 °C	-10 ... +70 °C	-10 ... +70 °C	-10 ... +70 °C	-25 ... +75 °C	-25 ... +75 °C	-10 ... +70 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	stainless steel	stainless steel	brass	brass	brass
housing length	30 mm	22 ... 46 mm	40 ... 46 mm	22 ... 46 mm	40 ... 50 mm	40 ... 50 mm	60 mm
connection types	connector M5	connector M8 cable	connector M8 cable	connector M8 cable	connector M12 cable	connector M12 cable	connector M12
output circuit	0 ... 10 V	0 ... 10 V 0 ... 10 mA	0 ... 10 V 0 ... 10 mA	0 ... 10 V 0 ... 10 mA	0 ... 10 V	0 ... 10 V 0 ... 10 mA	1 ... 9 V
page	164	165 ... 167	168	169 ... 171	172	173	174

Distance sensors for factory automation – rectangular designs

product family	IWFM 05	IF08.D02S	IWFM 12	IWFM 12	IWFM 18	IWFM 20	IWFM 20
							
dimension	5 × 5 mm	8 × 4,7 mm	12 × 12 mm	12 × 12 mm	18 × 10 mm	20 × 12 mm	20 × 12 mm
measuring distance Sd	0 ... 1 mm	0 ... 2 mm	0 ... 4 mm	1 ... 2 mm	0 ... 4 mm	0 ... 2 mm	2 ... 5 mm
mounting type	flush	flush	flush	flush	flush	flush	flush
resolution min.	1 µm	1 µm	1 µm	1 µm	1 µm	1 µm	1 µm
repeat accuracy	10 µm	20 µm	5 µm	20 µm	5 µm	10 µm	10 µm
response time	0,5 ms	1 ms	2 ms	2 ms	2 ms	0,5 ms	1 ms
operating temperature	+10 ... +60 °C	+10 ... +60 °C	-10 ... +70 °C	0 ... +60 °C	-10 ... +70 °C	-10 ... +70 °C	0 ... +60 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	brass	zinc die-cast	brass	brass	brass	brass	brass
housing length	32 mm	16 mm	60 mm	60 mm	30 mm	30 mm	35 mm
connection types	connector M5	cable flylead connector M5/M8	connector M8 cable	cable	connector M8	flylead connector M8	connector M8
output circuit	0 ... 10 V	0 ... 10 V	0 ... 10 V 4 ... 20 mA		0 ... 10 V 4 ... 20 mA	0 ... 10 V	1 ... 9 V 4 ... 20 mA
page	178	179	180	181	182	183	184

IR18.D08S	IR30.D18S	IR30.D24S
		
M18	M30	M30
0 ... 8 mm	0 ... 18 mm	0 ... 24 mm
quasi-flush	flush	non flush
2 µm	5 µm	5 µm
15 µm	20 µm	20 µm
2 ms	2 ms	2 ms
-10 ... +70 °C	-25 ... +75 °C	-25 ... +75 °C
IP 67	IP 67	IP 67
brass	brass	brass
50 ... 60 mm	50 ... 60 mm	50 ... 60 mm
connector M12 cable	connector M12 cable	connector M12 cable
0 ... 10 V	0 ... 10 V 0 ... 10 mA	0 ... 10 V 0 ... 10 mA
175	176	177

With linearized characteristic curve

product family	IR06.D03L	IR08.D03L	IR12.D04L	IR12.D06L	IR18.D08L	IR30.D18L	IR30.D24L
							
dimension	ø 6,5 mm	M8	M12	M12	M18	M30	M30
measuring distance Sd	0 ... 3 mm	0 ... 3 mm	0 ... 4 mm	0 ... 6 mm	0 ... 8 mm	0 ... 24 mm	0 ... 24 mm
mounting type	quasi-flush	quasi-flush	flush	quasi-flush	quasi-flush	flush	non flush
resolution min.	3 µm	3 µm	3 µm	3 µm	8 µm	5 µm	5 µm
repeat accuracy	10 µm	10 µm	10 µm	10 µm	15 µm	20 µm	20 µm
response time	2 ms	2 ms	1 ms	1 ms	1 ms	5 ms	5 ms
operating temperature	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C	-25 ... +75 °C
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
housing material	stainless steel	stainless steel	brass	brass	brass	brass	brass
housing length	40 ... 46 mm	46 mm	60 mm	60 mm	60 mm	60 mm	60 mm
connection types	connector M8	connector M8	connector M12	connector M12	connector M12	connector M12	connector M12
output circuit	0 ... 10 V	0 ... 10 V	0 ... 10 V	0 ... 10 V 4 ... 20 mA	0 ... 10 V	0 ... 10 V 4 ... 20 mA	0 ... 10 V 4 ... 20 mA
page	185	186	187	188 ... 190	191 ... 192	193	194

IWFM 18	IWFK 20
	
18 x 10 mm	20 x 15 mm
0 ... 4 mm	0 ... 10 mm
flush	flush
5 µm	10 µm
10 µm	15 µm
2,5 ms	3 ms
-10 ... +70 °C	-10 ... +70 °C
IP 67	IP 67
brass	polyester
30 mm	42 mm
connector M8	connector M8
0 ... 10 V	0 ... 10 V
195	196

Application specific distance sensors

product family	IR12.D03K	IR18.D03K	IR18.D08F	IWRR 18	IWRM 18	IWRM 12
						
features	High Sensitivity	High Sensitivity	Faktor 1	Outdoor Washdown	Outdoor	ATEX 2D
dimension	M12	M18	M18	M18	M18	M12
measuring distance Sd	2,75 ... 3 mm	2,75 ... 3 mm	0 ... 8 mm	0 ... 7 mm	0 ... 8 mm	0 ... 4 mm
mounting type	flush	flush	flush	quasi-flush	quasi-flush	quasi-flush
resolution min.	0,25 µm	0,25 µm	20 µm	5 µm	5 µm	1 µm
sensitivity	40 V/mm 64 mA/mm	40 V/mm 64 mA/mm	1,25 V/mm	2,3 mA/mm	2 mA/mm	4 mA/mm
repeat accuracy	1 µm	1 µm	30 µm	15 µm	15 µm	10 µm
response time	3 ms	3 ms	15 ms	2 ms	2 ms	2 ms
operating temperature	-10 ... +60 °C	-10 ... +60 °C	-25 ... +75 °C	-40 ... +70 °C	-40 ... +70 °C	-40 ... +70 °C
protection class	IP 67	IP 67	IP 67	IP 68/69K & proTect+	IP 67	IP 67
housing material	steel-nickel plated	steel-nickel plated	brass	stainless steel	brass	brass
housing length	60 mm	60 mm	60 mm	60 mm	60 mm	50 mm
connection types	connector M12 cable	connector M12 cable	connector M12	connector M12	connector M12	connector M12
output circuit	0 ... 10 V 4 ... 20 mA	0 ... 10 V 4 ... 20 mA	0 ... 10 V	4 ... 20 mA	4 ... 20 mA	4 ... 20 mA
page	197	198	199	200	201	202

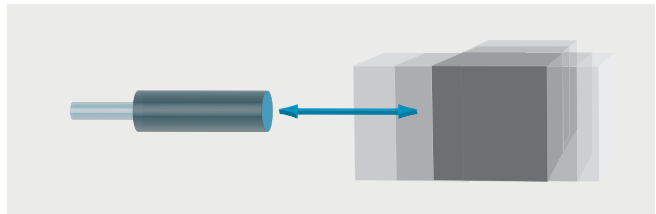


Function

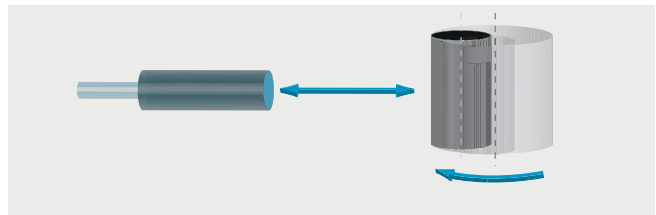
Inductive sensors with analog output signals are characterized by their short response times, high resolution and linearity as well as their outstanding repeat accuracy. The output current and voltage values are proportional to the distance between the sensor and the object being detected. In other words, they represent absolute measured values corresponding to the distance between the active surface and the object. These properties make inductively measuring linear sensors extremely interesting for numerous applications in the area of measurement and control engineering.

Typical applications

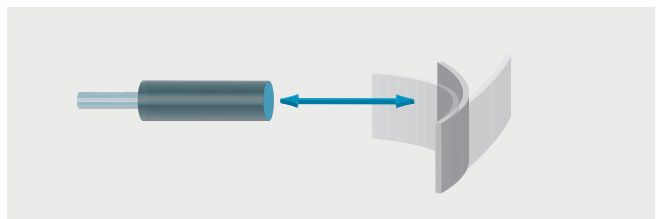
Travel / position / displacement



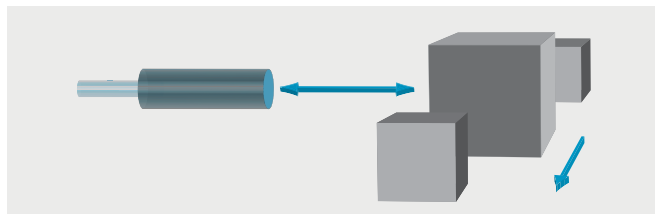
Diameter / eccentricity



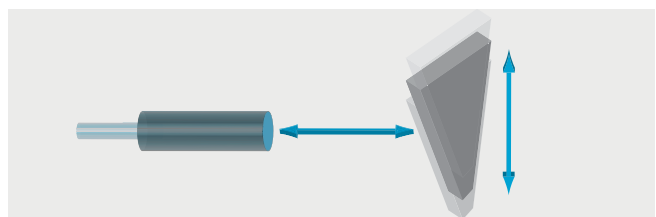
Deflection / deformation



Size comparison / measurement tolerance

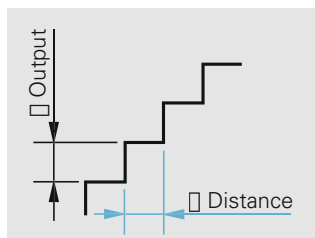


Taper / ramp



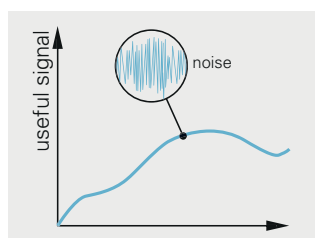


Resolution in general



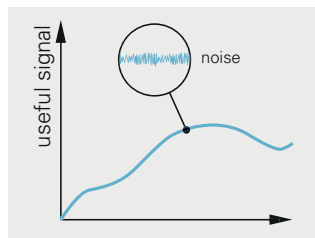
Resolution represents the smallest possible change in distance which will produce a measurable signal change at the sensor's output. Resolution can be impaired by high-frequency electrical interference (noise) or by the resolution of digital/analog converters.

Dynamic resolution



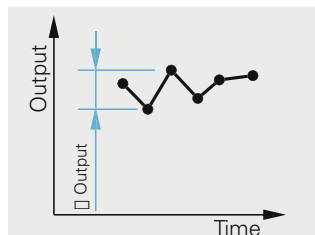
Signal noise exerts full effect on signal processing during very rapid measurements (high scan rates). Filtration without influencing the useful signal is only possible to a limited extent, if at all.

Static resolution



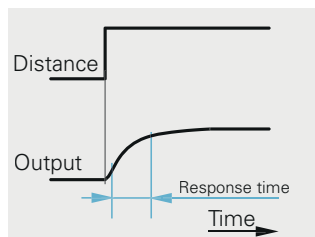
Very slow object movements (low scan rates) such as the temperature expansion of shafts allow the high-frequency interference to be filtered. The carrier signal is not influenced by this filtration. Using this technique significantly increases the resolution when compared to dynamic measurements.

Repeat accuracy



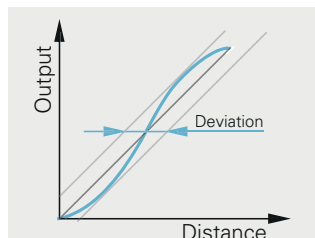
Repeat accuracy means the difference between the measured values of successive measurements within a period of 8 hours at an ambient temperature of $23\text{ °C} \pm 5\text{ °C}$.

Response time



The time which the signal output of a sensor requires to rise from 10 % to 90 % of the maximum signal level is called the response time.

FS Linearity



Linearity defines the deviation between the output signal and a straight line. It is given as a percentage of the measuring range end value (FS or Full Scale). The following alternatives are available for applications where the indicated linearity is insufficient:

- Sensors with linearized output curves
- Polynomials for the mathematical linearization of the sensor curve's in the controller



Functions

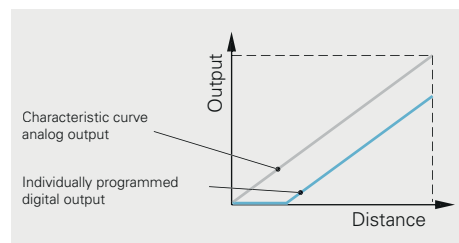
The following parameters can be altered using the Teach-in function:

- Analog output (measuring range)
- Digital output (switching window)

Procedure

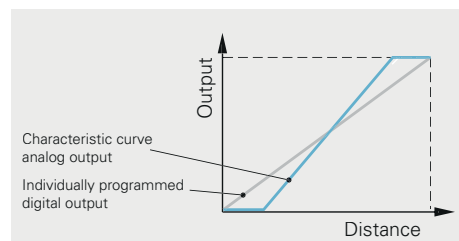
Baumer AlphaProx sensors with linearized characteristic curve, factor 1 sensors and high sensitivity sensors have a teach function with several teach modes. This allows the measuring range to be freely configured within specified limits. If, for example, a small measuring range with a large signal amplitude is required, it is possible to limit this to a few millimeters. The operating direction of the analog output can also be inverted if required.

In addition, the switch-on and switch-off points of a digital output can be defined. These may lie both within and outside the individually programmed measuring range.



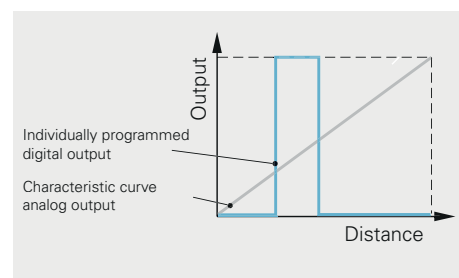
1-Point Teach Analog

Teaching-in of the start position (e.g. 0 V), center position (e.g. 5 V) or end position (e.g. 10 V) of the measuring range. In this teach mode, the output characteristic curve can be shifted without changing the sensitivity or slope of the characteristic curve. It is used for electronic compensation of installation tolerances and thus enables quick and easy adjustment in series production.



2-Point Teach Analog

The 2-point teach is used in applications in which two reference points (start and end position) can be approached. By adjusting the measuring range, the sensitivity or slope of the output characteristic curve can be perfectly adapted to the application and installation and mechanical manufacturing tolerances can be compensated. The first taught-in position always corresponds to the start value (e.g. 0 V) and the second to the end value (e.g. 10 V). Depending on the teach sequence, the output characteristic curve increases or decreases as the target object approaches.



Window Teach Digital

Analog distance sensors with an additional digital output offer a window teach digital instead of a 2-point Teach analog. This allows defining a valid or invalid distance range between the target and sensor for the digital output - independent of the analog output signal. Depending on the teach sequence, the digital output is HIGH or LOW if the measured object is within the taught-in distance range. This teach function is used to define a separate switching signal, e.g. for an end position circuit, independently of the analog signal.

**Procedure****Factory Reset**

All sensors with teach functions have a factory reset to reset the sensor to the factory settings.

Accessories

Various accessories are available for analog sensors, such as an external teach-in adapter or an analog sensor tester.

**Sd = 0 ... 1 mm**

- compact housing design
- very high resolution
- short response time

**general data**

mounting type	quasi-flush
measuring distance Sd	0 ... 1 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,005 mm
linearity error	± 100 µm
temperature drift	± 5 % (Full Scale)

electrical data

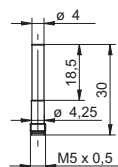
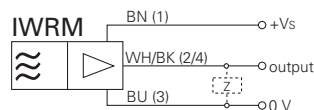
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	15 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
housing material	stainless steel
dimension	4 mm
housing length	30 mm
connection types	connector M5

ambient conditions

operating temperature	10 ... +60 °C
protection class	IP 67

order reference**IWRM 04U9701/S05****dimension drawing****connection diagram****connectors and mating connectors**

ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
ESG 05AP0200G	Connector M5, 4 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

**Sd = 0 ... 3 mm**

- large measuring distance
- very short type
- very high resolution

general data

mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	- 0 µm / + 270 µm (S = 0,2 ... 1,7 mm) - 150 µm / + 900 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -25 ... +75 °C)

electrical data

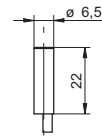
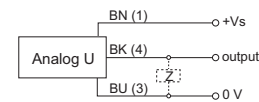
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
housing material	stainless steel
dimension	6,5 mm
housing length	22 mm
connection types	cable, 2 m

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

order reference**IR06.D03S-11144078****dimension drawing****connection diagram****Accessories**

10109474 Mounting bracket for sensors Ø 6,5 mm

10117742 Clamping nut for sensors Ø 6,5 mm

for details: see accessories section

**Sd = 0 ... 3 mm**

- large measuring distance
- short type
- very high resolution

general data

mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 120 µm (S = 0,75 ... 2,25 mm) ± 360 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -10 ... +70 °C)

electrical data

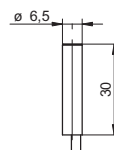
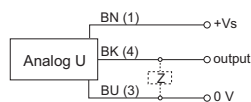
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical smooth
housing material	stainless steel
dimension	6,5 mm
housing length	30 mm
connection types	cable, 2 m

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

order reference**IR06.D03S-11144090****dimension drawing****connection diagram****Accessories**

10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm

for details: see accessories section

**Sd = 0 ... 3 mm**

- large measuring distance
- very high resolution

**general data**

mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 120 µm (S = 0,75 ... 2,25 mm) ± 360 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -10 ... +70 °C)

electrical data

response time (factory characteristic)	< 0,5 ms
short circuit protection	yes
reverse polarity protection	yes

voltage output

voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm

current output

voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	12 mA
output signal	0 ... 10 mA
load resistance	< 100 Ohm/V * Vs - 400 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)

mechanical data

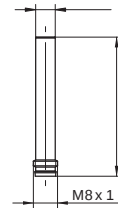
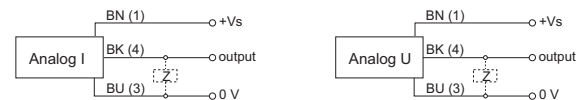
type	cylindrical smooth
housing material	stainless steel
dimension	6,5 mm
housing length	46 mm
connection types	connector M8

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

order reference**output circuit**

IR06.D03S-11141032	current output
IR06.D03S-11137807	voltage output

dimension drawing**connection diagrams****connectors and mating connectors**

ESG 32SH0200 Connector M8, 3 pin, straight, 2 m

ESW 31SH0200 Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10109474 Mounting bracket for sensors Ø 6,5 mm

10117742 Clamping nut for sensors Ø 6,5 mm

for details: see accessories section

**Sd = 0 ... 2 mm**

- large measuring distance
- very high resolution

general data

mounting type	flush
measuring distance Sd	0 ... 2 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 60 µm (S = 0,5 ... 1,5 mm) ± 140 µm (S = 0 ... 2 mm)
temperature drift	± 3 % (Full Scale; 0 ... +60 °C) ± 5 % (Full Scale; -10 ... +70 °C)

electrical data

response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

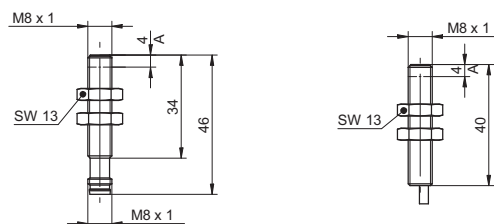
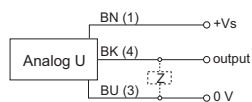
mechanical data

type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
tightening torque max.	10 Nm (A: 7 Nm)

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

order reference	housing length	connection types
IR08.D02S-11130472	40 mm	cable, 2 m
IR08.D02S-11123872	46 mm	connector M8

dimension drawings**connection diagram****connectors and mating connectors**

ESG 32SH0200 Connector M8, 3 pin, straight, 2 m

ESW 31SH0200 Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151719 Sensofix series 08 round

for details: see accessories section

**Sd = 0 ... 3 mm**

- large measuring distance
- very high resolution

general data

mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	- 0 µm / + 270 µm (S = 0,2 ... 1,7 mm) - 150 µm / + 900 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -25 ... +75 °C)

electrical data

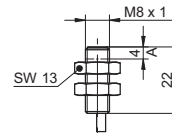
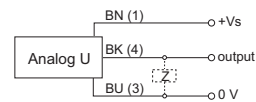
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
housing length	22 mm
connection types	cable, 2 m
tightening torque max.	10 Nm (A: 7 Nm)

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

order reference**IR08.D03S-11141036****dimension drawing****connection diagram****Accessories**

10151719 Sensofix series 08 round

for details: see accessories section

**Sd = 0 ... 3 mm**

- large measuring distance
- very high resolution

**general data**

mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 120 µm (S = 0,75 ... 2,25 mm) ± 360 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -10 ... +70 °C)

electrical data

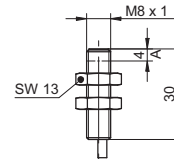
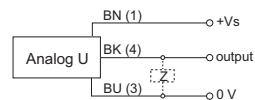
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
housing length	30 mm
connection types	cable, 2 m
tightening torque max.	10 Nm (A: 7 Nm)

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

order reference**IR08.D03S-11141037****dimension drawing****connection diagram****Accessories**

10151719 Sensofix series 08 round

for details: see accessories section

**Sd = 0 ... 3 mm**

- large measuring distance
- very high resolution

general data

mounting type	quasi-flush
measuring distance Sd	0 ... 3 mm
resolution	< 0,001 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 120 µm (S = 0,75 ... 2,25 mm) ± 360 µm (S = 0 ... 3 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -10 ... +70 °C)

electrical data

response time (factory characteristic)	< 0,5 ms
short circuit protection	yes
reverse polarity protection	yes

voltage output

voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm

current output

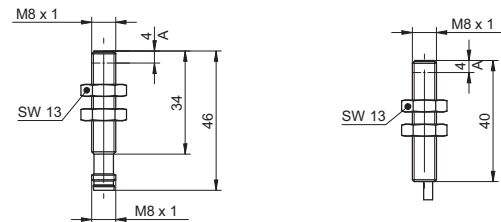
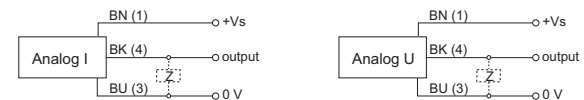
voltage supply range +Vs	6 ... 36 VDC
current consumption max. (no load)	12 mA
output signal	0 ... 10 mA
load resistance	< 100 Ohm/V * Vs - 400 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)

mechanical data

type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
tightening torque max.	10 Nm (A: 7 Nm)

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

dimension drawings**connection diagrams****connectors and mating connectors**

ESG 32SH0200 Connector M8, 3 pin, straight, 2 m

ESW 31SH0200 Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151719 Sensofix series 08 round

for details: see accessories section

order reference	output circuit	housing length	connection types
IR08.D03S-11130473	voltage output	40 mm	cable, 2 m
IR08.D03S-11141034	current output	46 mm	connector M8
IR08.D03S-11123873	voltage output	46 mm	connector M8

**Sd = 0 ... 4 mm**

- large measuring distance
- very high resolution

general data

mounting type	flush
measuring distance Sd	0 ... 4 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,01 mm
linearity error	± 80 µm (S = 1 ... 3 mm) ± 280 µm (S = 0 ... 4 mm)
temperature drift	± 2 % (Full Scale; 0 ... +60 °C) ± 3 % (Full Scale; -25 ... +75 °C)

electrical data

response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

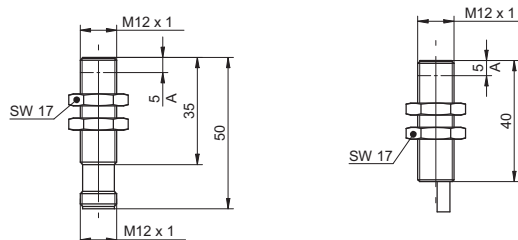
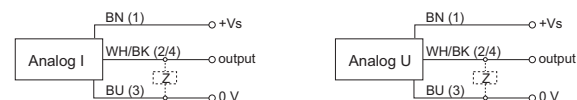
mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

order reference	housing length	connection types
IR12.D04S-11130475	40 mm	cable, 2 m
IR12.D04S-11123876	50 mm	connector M12

dimension drawings**connection diagrams****connectors and mating connectors**

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
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for details: see accessories section

**Sd = 0 ... 6 mm**

- large measuring distance
- very high resolution

general data

mounting type	quasi-flush
measuring distance Sd	0 ... 6 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,01 mm
linearity error	± 300 µm (S = 1,5 ... 4,5 mm) ± 720 µm (S = 0 ... 6 mm)
temperature drift	± 4 % (Full Scale; 0 ... +60 °C) ± 6 % (Full Scale; -25 ... +75 °C)

electrical data

response time (factory characteristic)	< 1 ms
current consumption max. (no load)	10 mA
short circuit protection	yes
reverse polarity protection	yes

voltage output

voltage supply range +Vs	12 ... 36 VDC
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm

current output

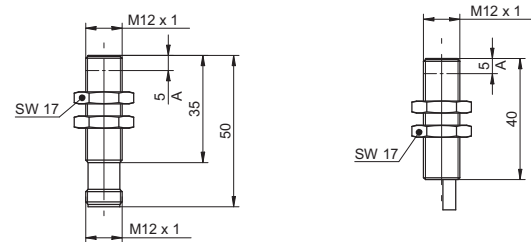
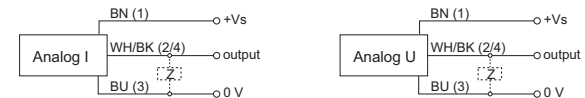
voltage supply range +Vs	8 ... 36 VDC
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 150 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
tightening torque max.	15 Nm (A: 10 Nm)

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

**dimension drawings****connection diagrams****connectors and mating connectors**

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
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for details: see accessories section

order reference	output circuit	housing length	connection types
IR12.D06S-11130476	voltage output	40 mm	cable, 2 m
IR12.D06S-11141039	current output	50 mm	connector M12
IR12.D06S-11123877	voltage output	50 mm	connector M12

**Sd = 2 ... 5 mm**

- large measuring distance
- very high resolution

**general data**

mounting type	flush
measuring distance Sd	2 ... 5 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,015 mm
linearity error	± 350 µm
temperature drift	± 2 % (Full Scale; 0 ... +60 °C) ± 4 % (Full Scale; -10 ... +70 °C)

electrical data

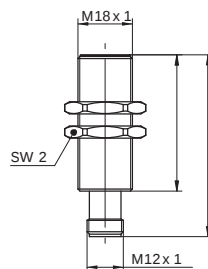
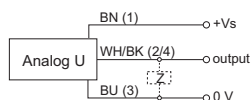
response time (factory characteristic)	< 2 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	1 ... 9 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	40 Nm

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

order reference**IR18.D05S-11140166****dimension drawing****connection diagram****connectors and mating connectors**

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)

for details: see accessories section

**Sd = 0 ... 8 mm**

- large measuring distance
- very high resolution

general data

mounting type	quasi-flush
measuring distance Sd	0 ... 8 mm
resolution	< 0,002 mm (stat.) < 0,006 mm (dynam.)
repeat accuracy	< 0,015 mm
linearity error	± 240 µm (S = 2 ... 6 mm) ± 640 µm (S = 0 ... 8 mm)
temperature drift	± 2 % (Full Scale; 0 ... +60 °C) ± 4 % (Full Scale; -10 ... +70 °C)

electrical data

response time (factory characteristic)	< 2 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

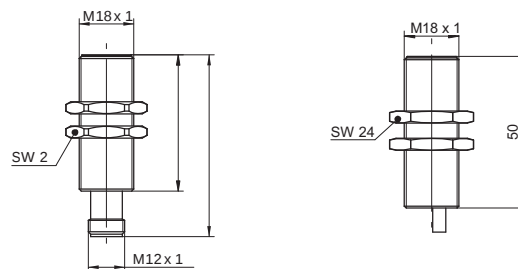
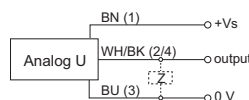
mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
tightening torque max.	40 Nm

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

order reference	housing length	connection types
IR18.D08S-11130479	50 mm	cable, 2 m
IR18.D08S-11123879	60 mm	connector M12

dimension drawings**connection diagram****connectors and mating connectors**

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)

for details: see accessories section

**Sd = 0 ... 18 mm**

- linear analog output
- large measuring distance

**general data**

mounting type	flush
measuring distance Sd	0 ... 18 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 800 µm (S = 4,5 ... 13,5 mm) ± 2400 µm (S = 0 ... 18 mm)
temperature drift	± 6 % (Full Scale)

electrical data

response time (factory characteristic)	< 2 ms
short circuit protection	yes
reverse polarity protection	yes

voltage output

voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm

current output

voltage supply range +Vs	8 ... 36 VDC
current consumption max. (no load)	20 mA
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)

mechanical data

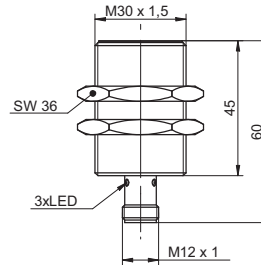
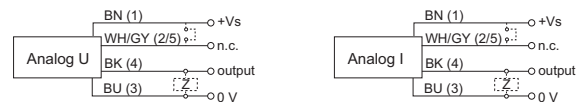
type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	100 Nm

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

order reference

IR30.D18S-11179024	current output
IR30.D18S-11179023	voltage output

dimension drawing**connection diagrams****connectors and mating connectors**

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

**Sd = 0 ... 24 mm**

- linear analog output
- large measuring distance

**general data**

mounting type	non-flush
measuring distance Sd	0 ... 24 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 800 µm (S = 6 ... 18 mm) ± 3000 µm (S = 0 ... 24 mm)
temperature drift	± 8 % (Full Scale)

electrical data

response time (factory characteristic)	< 2 ms
short circuit protection	yes
reverse polarity protection	yes

voltage output

voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	10 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm

current output

voltage supply range +Vs	8 ... 36 VDC
current consumption max. (no load)	20 mA
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)

mechanical data

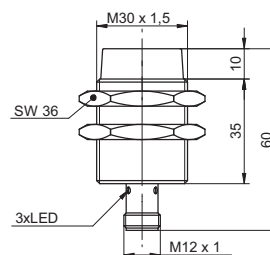
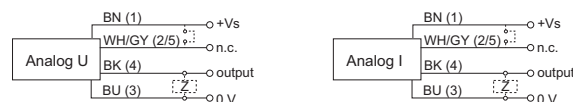
type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	100 Nm

ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

order reference**output circuit**

IR30.D24S-11179026	current output
IR30.D24S-11179025	voltage output

dimension drawing**connection diagrams****connectors and mating connectors**

ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

**Sd = 0 ... 1 mm**

- very high resolution
- short response time

general data

mounting type	quasi-flush
measuring distance Sd	0 ... 1 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,01 mm
linearity error	± 70 µm
temperature drift	± 5 % (Full Scale)

electrical data

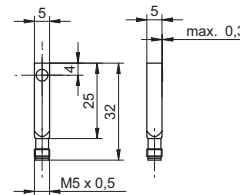
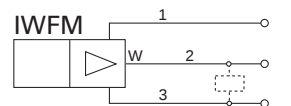
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	15 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
housing material	brass nickel plated
dimension	5 mm
housing length	32 mm
connection types	connector M5

ambient conditions

operating temperature	10 ... +60 °C
protection class	IP 67

order reference**IWFM 05U9701/S05****dimension drawing****connection diagram****connectors and mating connectors**

ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m
ESG 05AP0200G	Connector M5, 4 pin, straight, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories	

**Sd = 0 ... 2 mm**

- very high resolution
- short response time

general data

mounting type	flush
measuring distance Sd	0 ... 2 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,02 mm
linearity error	± 120 µm
temperature drift	± 5 % (Full Scale)

electrical data

response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 30 VDC
current consumption max. (no load)	8 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

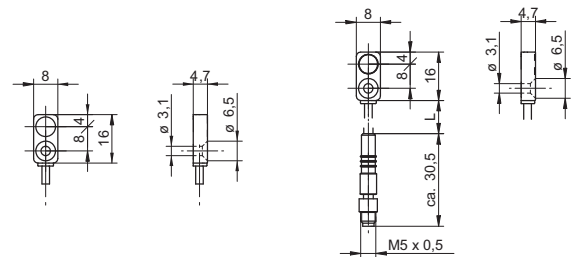
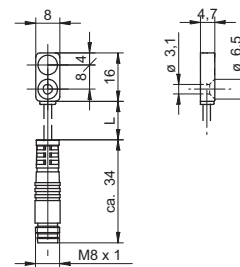
type	rectangular
housing material	die-cast zinc nickel plated
dimension	8 mm
housing length	16 mm

ambient conditions

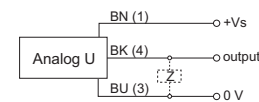
operating temperature	10 ... +60 °C
protection class	IP 67

order reference**connection types**

IF08.D02S-F16.UA1Z.7WCU	cable PUR, 2 m
IF08.D02S-F16.UA1Z.7WCV	cable PVC, 2 m
IF08.D02S-F16.UA1Z.7WLV	flylead connector M8
IF08.D02S-F16.UA1Z.7WMV	flylead connector M5

dimension drawings**flylead connector version**

standard cable length 200 mm (L)

connection diagram**connectors and mating connectors**

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESG 05AP0200G	Connector M5, 4 pin, straight, 2 m, shielded
ESG 05SP0200	Connector M5, 3 pin, straight, 2 m
ESW 05SP0200	Connector M5, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

**Sd = 0 ... 4 mm**

- very high resolution
- short response time
- current- and voltage output

general data

mounting type	flush
measuring distance Sd	0 ... 4 mm
linearity error	± 160 µm
temperature drift	± 4 % (Full Scale)

electrical data

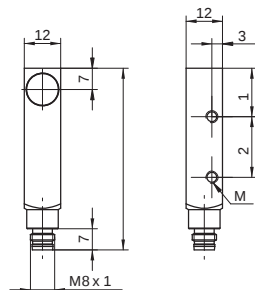
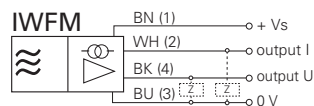
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	40 mA
output circuit	voltage - / current output
output signal	0 ... 10 V / 4 ... 20 mA
load resistance	> 1000 Ohm (Uout) / 330 ... 1000 Ohm (Iout)
voltage drop Vd	< 7,2 VDC (Iout)
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
housing material	brass nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M8

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

dimension drawing**connection diagram****connectors and mating connectors**

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

order reference	resolution	repeat accuracy	response time (factory characteristic)
IWFM 12L9504/S35A	< 0,005 mm	< 0,01 mm	< 2 ms
IWFM 12L9505/S35A	< 0,001 mm	< 0,005 mm	< 30 ms

**Sd = 1 ... 2 mm**

- shielded mounting
- short design

**general data**

mounting type	flush
measuring distance Sd	1 ... 2 mm
reference distance	1,35 ... 1,65 mm
measuring speed	< 0,5 mm / ms
repeat accuracy	< 0,02 mm
linearity error	± 80 µm
temperature coefficient	1 µm / (K mm)

electrical data

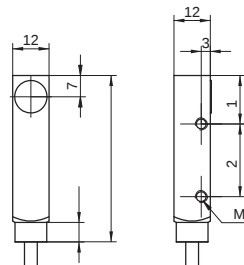
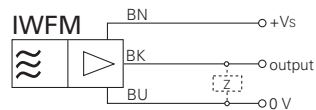
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	20 mA
output circuit	voltage output
output signal	1 ... 9 VDC
load resistance	> 1000 Ohm
residual output ripple	< 0,5 % Vs
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
housing material	brass nickel plated
dimension	12 mm
housing length	55 mm
connection types	cable, 2 m

ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 67

order reference**IWFM 12U9501/O1****dimension drawing****connection diagram**

**Sd = 0 ... 4 mm**

- very high resolution
- short response time
- linear analog output

**general data**

mounting type	flush
measuring distance Sd	0 ... 4 mm

voltage - / current output

linearity error	± 160 µm
temperature drift	± 4 % (Full Scale)

voltage output

special type	linearized
linearity error	± 16 µm
temperature drift	± 5 % (Full Scale)

electrical data

voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes

voltage - / current output

current consumption max. (no load)	40 mA
output signal	0 ... 10 V / 4 ... 20 mA
load resistance	> 1000 Ohm (Uout) / 330 ... 1000 Ohm (Iout)
voltage drop Vd	< 7,2 VDC (Iout)

voltage output

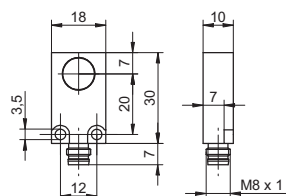
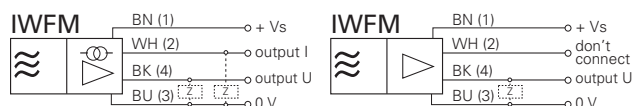
current consumption max. (no load)	20 mA
output signal	0 ... 10 VDC

mechanical data

type	rectangular
housing material	brass nickel plated
dimension	18 mm
housing length	30 mm
connection types	connector M8

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

dimension drawing**connection diagrams****connectors and mating connectors**

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10152385	Sensofix series 18/20 inductive rectangular
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for details: see accessories section

order reference	resolution	repeat accuracy	output circuit	response time (factory characteristic)	linearity error	temperature drift	special type
IWFM 18L9504/S35A	< 0,005 mm	< 0,01 mm	voltage - / current output	< 2 ms	± 160 µm	± 4 % (Full Scale)	-
IWFM 18L9505/S35A	< 0,001 mm	< 0,005 mm	voltage - / current output	< 30 ms	± 160 µm	± 4 % (Full Scale)	-
IWFM 18U7504/S35A	< 0,005 mm	< 0,01 mm	voltage output	< 2,5 ms	± 16 µm	± 5 % (Full Scale)	linearized

**Sd = 0 ... 2 mm**

- small linearity error
- very short response time

**general data**

mounting type	flush
measuring distance Sd	0 ... 2 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,01 mm
linearity error	± 40 µm
temperature drift	± 2 % (Full Scale)

electrical data

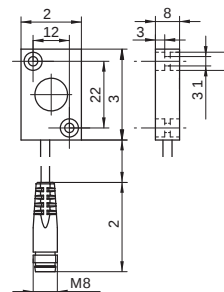
response time (factory characteristic)	< 0,5 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	20 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

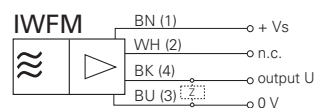
type	rectangular
housing material	brass nickel plated
dimension	20 mm
housing length	30 mm
connection types	flylead connector M8

ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

order reference**IWFM 20U9509/KS35AP****dimension drawing**

standard cable length 200 mm (L)

connection diagram**connectors and mating connectors**

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories



Sd = 2 ... 5 mm

- Integrated current and voltage output
- Fully integrated electronics

**general data**

mounting type	flush
measuring speed	< 1 mm / ms
repeat accuracy	< 0,01 mm
temperature coefficient	1 µm / (K mm)

electrical data

voltage supply range +Vs	15 ... 30 VDC
residual output ripple	< 0,5 % Vs
short circuit protection	yes
reverse polarity protection	yes

voltage output

current consumption max. (no load)	20 mA
output signal	1 ... 9 VDC
load resistance	> 1000 Ohm

current output

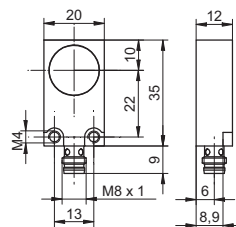
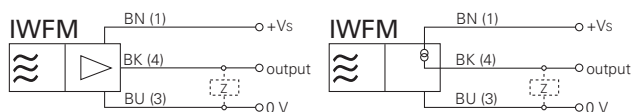
current consumption max. (no load)	35 mA
output signal	4 ... 20 mA
load resistance +Vs min.	< 500 Ohm
load resistance +Vs max.	< 1000 Ohm

mechanical data

type	rectangular
housing material	brass nickel plated
dimension	20 mm
housing length	35 mm
connection types	connector M8

ambient conditions

operating temperature	0 ... +60 °C
protection class	IP 67

dimension drawing**connection diagrams****connectors and mating connectors**

ESG 32SH0200 Connector M8, 3 pin, straight, 2 m

ESW 31SH0200 Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10152385 Sensofix series 18/20 inductive rectangular

for details: see accessories section

order reference	measuring distance Sd	reference distance	output circuit	linearity error
IWFM 20I9501/S35	2 ... 5 mm	3,25 ... 3,75 mm	current output	± 100 µm
IWFM 20I9503/S35	2 ... 3 mm	2,35 ... 2,65 mm	current output	± 60 µm
IWFM 20U9501/S35	2 ... 5 mm	3,25 ... 3,75 mm	voltage output	± 100 µm
IWFM 20U9503/S35	2 ... 3 mm	2,35 ... 2,65 mm	voltage output	± 60 µm



Sd = 0 ... 3 mm

- linear analog output
- large measuring distance
- magnetic teach

general data

mounting type	quasi-flush
special type	linearized
measuring distance Sd	0 ... 3 mm
sensitivity	3,33 V/mm
resolution	< 0,003 mm (stat.) < 0,009 mm (dynam., S = 0 ... 2 mm) < 0,018 mm (dynam., S = 0 ... 3 mm)
repeat accuracy	< 0,01 mm
temperature drift	± 2 % (Full Scale; S = 0 ... 2 mm) ± 6 % (Full Scale; S = 0 ... 3 mm)

electrical data

response time (factory characteristic)	< 2 ms
voltage supply range +Vs	12 ... 30 VDC
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

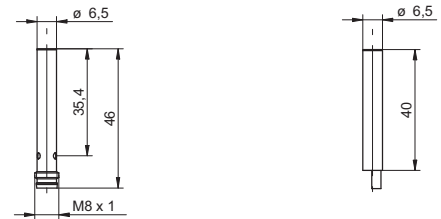
mechanical data

type	cylindrical smooth
housing material	stainless steel
dimension	6,5 mm

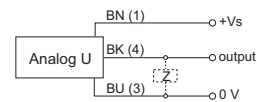
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawings



connection diagram



connectors and mating connectors

ESG 32SH0200 Connector M8, 3 pin, straight, 2 m

ESW 31SH0200 Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10109474	Mounting bracket for sensors Ø 6,5 mm
10117742	Clamping nut for sensors Ø 6,5 mm
11137318	Teach Pen for sensors in metal housing
11141124	Teach Pen for sensors in metal housing (USA, CAN, JP)

for details: see accessories section

order reference	adjustment	housing length	linearity error	connection types	current consumption max. (no load)
IR06.D03L-11174154	-	40 mm	± 15 µm (S = 0 ... 2 mm) ± 90 µm (S = 0 ... 3 mm)	cable, 2 m	10 mA
IR06.D03L-11176070	Teach-in	46 mm	± 10 µm (S = 0 ... 2 mm) ± 90 µm (S = 0 ... 3 mm)	connector M8	12 mA
IR06.D03L-11174153	-	46 mm	± 15 µm (S = 0 ... 2 mm) ± 90 µm (S = 0 ... 3 mm)	connector M8	10 mA

Inductive distance sensors linearized characteristic curve *AlphaProx*® IR08.D03L



Sd = 0 ... 3 mm

- linear analog output
- large measuring distance
- magnetic teach



general data

mounting type	quasi-flush
special type	linearized
measuring distance Sd	0 ... 3 mm
sensitivity	3,33 V/mm
resolution	< 0,003 mm (stat.) < 0,009 mm (dynam., S = 0 ... 2 mm) < 0,018 mm (dynam., S = 0 ... 3 mm)
repeat accuracy	< 0,01 mm
linearity error	± 10 µm (S = 0 ... 2 mm) ± 90 µm (S = 0 ... 3 mm)
temperature drift	± 2 % (Full Scale; S = 0 ... 2 mm) ± 6 % (Full Scale; S = 0 ... 3 mm)

electrical data

response time (factory characteristic)	< 2 ms
voltage supply range +Vs	12 ... 30 VDC
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

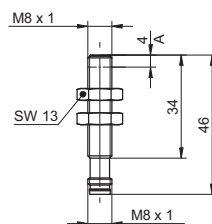
mechanical data

type	cylindrical threaded
housing material	stainless steel
dimension	8 mm
housing length	46 mm
connection types	connector M8
tightening torque max.	10 Nm (A: 7 Nm)

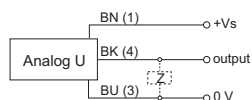
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagram



connectors and mating connectors

ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m

additional cable connectors and field wireable connectors: see accessories

Accessories

10151719	Sensofix series 08 round
11137318	Teach Pen for sensors in metal housing
11141124	Teach Pen for sensors in metal housing (USA, CAN, JP)

for details: see accessories section

order reference	adjustment	current consumption max. (no load)
IR08.D03L-11175999	Teach-in	12 mA
IR08.D03L-11141038	-	10 mA



Sd = 0 ... 4 mm

- linear analog output
- external Teach-in
- 2 adjustable switching points

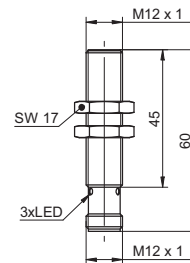
general data	
mounting type	flush
special type	2 adjust. switching points linearized
measuring distance Sd	0 ... 4 mm
sensitivity	2,5 V/mm
resolution	< 0,003 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,01 mm
adjustment	external Teach-in
teach	1-point analog, window digital, factory reset
linearity error	± 16 µm
temperature drift	± 4 % (Full Scale)
electrical data	
response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	15 mA
output circuit	voltage output / PNP
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
output current	< 100 mA (PNP)
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	15 Nm (A: 10 Nm)
ambient conditions	
operating temperature	-25 ... +75 °C (Vs = 12 ... 30 VDC) -25 ... +60 °C (Vs = 12 ... 36 VDC)
protection class	IP 67

order reference

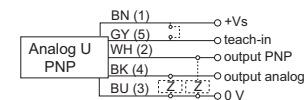
IR12.D04L-11130474



dimension drawing



connection diagram



connectors and mating connectors

ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12

for details: see accessories section



Sd = 0 ... 6 mm

- linear analog output
- external Teach-in
- large measuring distance



general data

mounting type	quasi-flush
special type	linearized
measuring distance Sd	0 ... 6 mm
resolution	< 0,003 mm (stat.) < 0,005 mm (dynam., S = 0 ... 4 mm) < 0,022 mm (dynam., S = 0 ... 6 mm)
repeat accuracy	< 0,01 mm
adjustment	external Teach-in
teach	1-point analog, 2-point analog, factory reset
temperature drift	± 2 % (Full Scale; S = 0 ... 4 mm) ± 5 % (Full Scale; S = 0 ... 6 mm)

voltage output

sensitivity	1,67 V/mm
linearity error	± 25 µm (S = 0 ... 4 mm) ± 60 µm (S = 0 ... 6 mm)

current output

sensitivity	2,67 mA/mm
linearity error	± 25 µm (S = 0 ... 4 mm) ± 120 µm (S = 0 ... 6 mm)

electrical data

response time (factory characteristic)	< 1 ms
short circuit protection	yes
reverse polarity protection	yes

voltage output

voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	15 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm

current output

voltage supply range +Vs	8 ... 36 VDC
current consumption max. (no load)	25 mA
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)

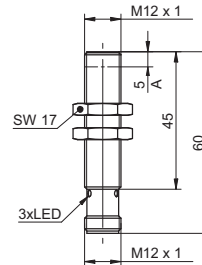
mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	15 Nm (A: 10 Nm)

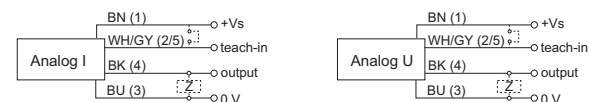
ambient conditions

operating temperature	-25 ... +75 °C (Vs = 8 ... 30 VDC) -25 ... +60 °C (Vs = 8 ... 36 VDC)
protection class	IP 67

dimension drawing



connection diagrams



connectors and mating connectors

ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12

for details: see accessories section

order reference	output circuit	linearity error	operating temperature	sensitivity
IR12.D06L-11157693	current output	$\pm 25 \mu\text{m}$ (S = 0 ... 4 mm)	-25 ... +75 °C (Vs = 8 ... 30 VDC)	2,67 mA/mm
		$\pm 120 \mu\text{m}$ (S = 0 ... 6 mm)	-25 ... +60 °C (Vs = 8 ... 36 VDC)	
IR12.D06L-11141090	voltage output	$\pm 25 \mu\text{m}$ (S = 0 ... 4 mm)	-25 ... +75 °C (Vs = 12 ... 30 VDC)	1,67 V/mm
		$\pm 60 \mu\text{m}$ (S = 0 ... 6 mm)	-25 ... +60 °C (Vs = 12 ... 36 VDC)	

Inductive distance sensors linearized characteristic curve *AlphaProx*® IR12.D06L



Sd = 0 ... 6 mm

- linear analog output
- external Teach-in
- 2 adjustable switching points

general data

mounting type	quasi-flush
special type	2 adjust. switching points linearized
measuring distance Sd	0 ... 6 mm
sensitivity	1,67 V/mm
resolution	< 0,003 mm (stat.) < 0,005 mm (dynam., S = 0 ... 4 mm) < 0,022 mm (dynam., S = 0 ... 6 mm)
repeat accuracy	< 0,01 mm
adjustment	external Teach-in
teach	1-point analog, window digital, factory reset
linearity error	± 25 µm (S = 0 ... 4 mm) ± 60 µm (S = 0 ... 6 mm)
temperature drift	± 2 % (Full Scale; S = 0 ... 4 mm) ± 5 % (Full Scale; S = 0 ... 6 mm)

electrical data

response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	15 mA
output circuit	voltage output / PNP
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
output current	< 100 mA (PNP)
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	15 Nm (A: 10 Nm)

ambient conditions

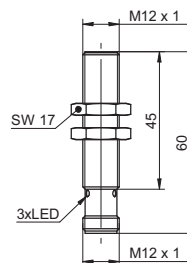
operating temperature	-25 ... +75 °C (Vs = 12 ... 30 VDC) -25 ... +60 °C (Vs = 12 ... 36 VDC)
protection class	IP 67

order reference

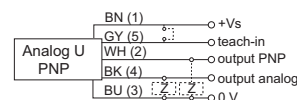
IR12.D06L-11135332



dimension drawing



connection diagram



connectors and mating connectors

ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12

for details: see accessories section

Inductive distance sensors linearized characteristic curve *AlphaProx*® IR18.D08L



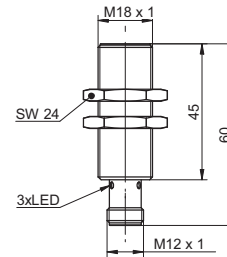
Sd = 0 ... 8 mm

- linear analog output
- external Teach-in
- large measuring distance

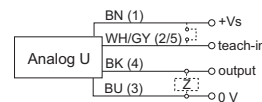


general data	
mounting type	quasi-flush
special type	linearized
measuring distance Sd	0 ... 8 mm
resolution	< 0,002 mm (stat.) < 0,006 mm (dynam.)
repeat accuracy	< 0,015 mm
adjustment	external Teach-in
teach	1-point analog, 2-point analog, factory reset
linearity error	± 32 µm
voltage output	
sensitivity	1,25 V/mm
temperature drift	± 3 % (Full Scale)
current output	
sensitivity	2,0 mA/mm
temperature drift	± 4 % (Full Scale)
electrical data	
response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 36 VDC
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	15 mA
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
current output	
current consumption max. (no load)	20 mA
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	40 Nm
ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagram



connectors and mating connectors

ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
10141584	Teach-in Adapter M12

for details: see accessories section

order reference	output circuit	temperature drift	sensitivity
IR18.D08L-11164789	current output	± 4 % (Full Scale)	2,0 mA/mm
IR18.D08L-11141092	voltage output	± 3 % (Full Scale)	1,25 V/mm

Inductive distance sensors linearized characteristic curve *AlphaProx*® IR18.D08L



Sd = 0 ... 8 mm

- linear analog output
- external Teach-in
- 2 adjustable switching points



general data

mounting type	quasi-flush
special type	2 adjust. switching points linearized
measuring distance Sd	0 ... 8 mm
sensitivity	1,25 V/mm
resolution	< 0,002 mm (stat.) < 0,006 mm (dynam.)
repeat accuracy	< 0,015 mm
adjustment	external Teach-in
teach	1-point analog, window digital, factory reset
linearity error	± 32 µm
temperature drift	± 3 % (Full Scale)

electrical data

response time (factory characteristic)	< 1 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	15 mA
output circuit	voltage output / push-pull
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
output current	< 100 mA (push-pull)
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	40 Nm

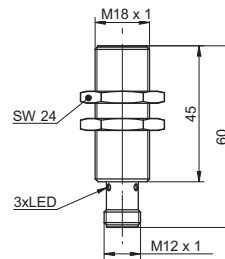
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

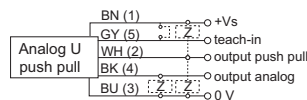
order reference

IR18.D08L-11130478

dimension drawing



connection diagram



connectors and mating connectors

ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
10141584	Teach-in Adapter M12

for details: see accessories section



Sd = 0 ... 18 mm

- linear analog output
- external Teach-in
- large measuring distance



general data

mounting type	flush
special type	linearized
measuring distance Sd	0 ... 18 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
adjustment	external Teach-in
teach	1-point analog, 2-point analog, factory reset
linearity error	± 360 µm
temperature drift	± 6 % (Full Scale)

voltage output

sensitivity	0,56 V/mm
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current output

sensitivity	0,89 mA/mm
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electrical data

response time (factory characteristic)	< 5 ms
current consumption max. (no load)	20 mA
short circuit protection	yes
reverse polarity protection	yes

voltage output

voltage supply range +Vs	12 ... 36 VDC
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm

current output

voltage supply range +Vs	8 ... 36 VDC
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)

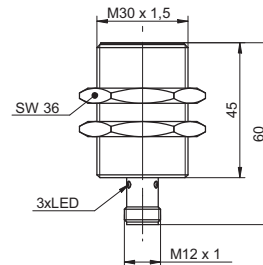
mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	100 Nm

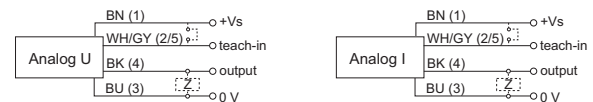
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

dimension drawing



connection diagrams



connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10141584	Teach-in Adapter M12
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for details: see accessories section

order reference	output circuit	sensitivity
IR30.D18L-11179029	current output	0,89 mA/mm
IR30.D18L-11179028	voltage output	0,56 V/mm

Inductive distance sensors linearized characteristic curve *AlphaProx*® IR30.D24L



Sd = 0 ... 24 mm

- linear analog output
- external Teach-in
- large measuring distance

general data

mounting type	non-flush
special type	linearized
measuring distance Sd	0 ... 24 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,02 mm
adjustment	external Teach-in
teach	1-point analog, 2-point analog, factory reset
linearity error	± 480 µm
temperature drift	± 6 % (Full Scale)

voltage output

sensitivity	0,42 V/mm
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current output

sensitivity	0,67 mA/mm
-------------	------------

electrical data

response time (factory characteristic)	< 5 ms
current consumption max. (no load)	20 mA
short circuit protection	yes
reverse polarity protection	yes

voltage output

voltage supply range +Vs	12 ... 36 VDC
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm

current output

voltage supply range +Vs	8 ... 36 VDC
output signal	4 ... 20 mA
load resistance	< 50 Ohm/V * Vs - 250 Ohm > 500 Ohm (Vs = 30 ... 36 VDC)

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	30 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	100 Nm

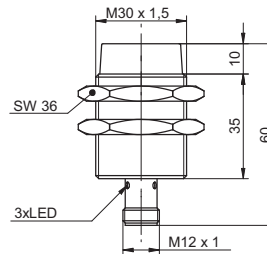
ambient conditions

operating temperature	-25 ... +75 °C
protection class	IP 67

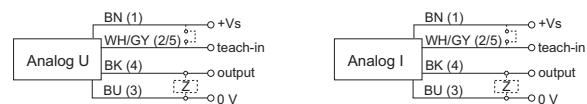
order reference	output circuit	sensitivity
IR30.D24L-11179051	current output	0,67 mA/mm
IR30.D24L-11179050	voltage output	0,42 V/mm



dimension drawing



connection diagrams



connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10141584	Teach-in Adapter M12
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for details: see accessories section



Sd = 0 ... 4 mm

- very high resolution
- short response time
- linear analog output



general data

mounting type	flush
measuring distance Sd	0 ... 4 mm

voltage - / current output

linearity error	± 160 µm
temperature drift	± 4 % (Full Scale)

voltage output

special type	linearized
linearity error	± 16 µm
temperature drift	± 5 % (Full Scale)

electrical data

voltage supply range +Vs	15 ... 30 VDC
short circuit protection	yes
reverse polarity protection	yes

voltage - / current output

current consumption max. (no load)	40 mA
output signal	0 ... 10 V / 4 ... 20 mA
load resistance	> 1000 Ohm (Uout) / 330 ... 1000 Ohm (Iout)
voltage drop Vd	< 7,2 VDC (Iout)

voltage output

current consumption max. (no load)	20 mA
output signal	0 ... 10 VDC

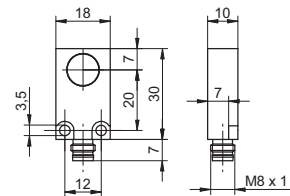
mechanical data

type	rectangular
housing material	brass nickel plated
dimension	18 mm
housing length	30 mm
connection types	connector M8

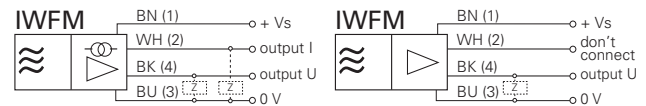
ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

dimension drawing



connection diagrams



connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10152385	Sensofix series 18/20 inductive rectangular
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for details: see accessories section

order reference	resolution	repeat accuracy	output circuit	response time (factory characteristic)	linearity error	temperature drift	special type
IWFM 18L9504/S35A	< 0,005 mm	< 0,01 mm	voltage - / current output	< 2 ms	± 160 µm	± 4 % (Full Scale)	-
IWFM 18L9505/S35A	< 0,001 mm	< 0,005 mm	voltage - / current output	< 30 ms	± 160 µm	± 4 % (Full Scale)	-
IWFM 18U7504/S35A	< 0,005 mm	< 0,01 mm	voltage output	< 2,5 ms	± 16 µm	± 5 % (Full Scale)	linearized



Sd = 0 ... 10 mm



- internal Teach-in
- analog- and switching output
- linear analog output

general data

mounting type	quasi-flush
special type	linearized
measuring distance Sd	0 ... 10 mm
resolution	< 0,01 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,015 mm
adjustment	Teach-in
linearity error	± 50 µm
temperature drift	± 5 % (Full Scale)

electrical data

response time (factory characteristic)	< 2,5 ms
response time (teach in characteristic)	< 3,1 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	30 mA
output circuit	voltage output / PNP
output signal	0 ... 10 VDC
load resistance	> 1000 Ohm
output current	< 10 mA (PNP)
voltage drop Vd	< 5 VDC (PNP)
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	rectangular
housing material	polyester
dimension	20 mm
housing length	42 mm
connection types	connector M8

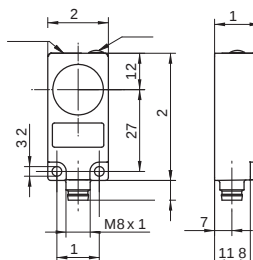
ambient conditions

operating temperature	-10 ... +70 °C
protection class	IP 67

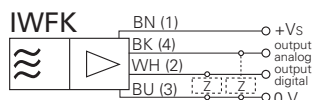
order reference

IWFK 20Z8704/S35A

dimension drawing



connection diagram



connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10152385	Sensofix series 18/20 inductive rectangular
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for details: see accessories section

**Sd = 2,75 ... 3 mm**

- linear analog output
- external Teach-in
- large measuring distance

general data

mounting type	flush
special type	linearized high sensitivity
measuring distance Sd	2,75 ... 3 mm
resolution	< 0,00025 mm (stat.) < 0,0005 mm (dynam.)
repeat accuracy	< 0,001 mm
adjustment	external Teach-in
teach	1-point analog, factory reset
linearity error	± 5 µm
temperature drift	± 4 % (Full Scale; +10 ... +30 °C) ± 12 % (Full Scale; -10 ... +60 °C)

voltage output

sensitivity	40 V/mm (Range: 0,25 mm)
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current output

sensitivity	64 mA/mm (Range: 0,25 mm)
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electrical data

response time (factory characteristic)	< 3 ms
current consumption max. (no load)	15 mA
short circuit protection	yes
reverse polarity protection	yes

voltage output

voltage supply range +Vs	12 ... 30 VDC
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm

current output

voltage supply range +Vs	8 ... 30 VDC
output signal	4 ... 20 mA
load resistance	< 25 Ohm/V * Vs

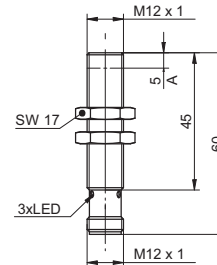
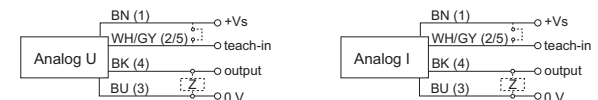
mechanical data

type	cylindrical threaded
material (sensing face)	ceramic
housing material	steel nickel plated
dimension	12 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	15 Nm

ambient conditions

operating temperature	-10 ... +60 °C
protection class	IP 67

order reference	output circuit	sensitivity
IR12.D03K-11158152	current output	64 mA/mm (Range: 0,25 mm)
IR12.D03K-11158153	voltage output	40 V/mm (Range: 0,25 mm)

**dimension drawing****connection diagrams****connectors and mating connectors**

ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12

for details: see accessories section


Sd = 2,75 ... 3 mm

- linear analog output
- High Sensitivity
- large measuring distance

general data

mounting type	flush
special type	linearized high sensitivity
measuring distance Sd	2,75 ... 3 mm
resolution	< 0,00025 mm (stat.) < 0,0005 mm (dynam.)
repeat accuracy	< 0,001 mm
adjustment	external Teach-in
teach	1-point analog, factory reset
linearity error	± 5 µm
temperature drift	± 4 % (Full Scale; +10 ... +30 °C) ± 12 % (Full Scale; -10 ... +60 °C)

voltage output

sensitivity	40 V/mm (Range: 0,25 mm)
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current output

sensitivity	64 mA/mm (Range: 0,25 mm)
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electrical data

response time (factory characteristic)	< 3 ms
current consumption max. (no load)	15 mA
short circuit protection	yes
reverse polarity protection	yes

voltage output

voltage supply range +Vs	12 ... 30 VDC
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm

current output

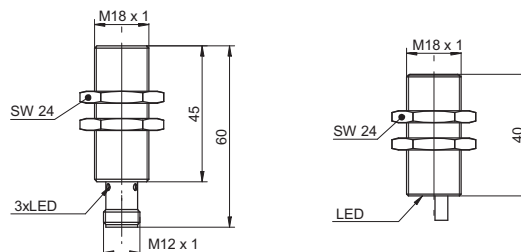
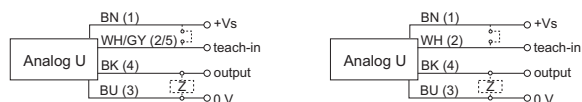
voltage supply range +Vs	8 ... 30 VDC
output signal	4 ... 20 mA
load resistance	< 25 Ohm/V * Vs

mechanical data

type	cylindrical threaded
material (sensing face)	ceramic
housing material	steel nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	40 Nm

ambient conditions

operating temperature	-10 ... +60 °C
protection class	IP 67


dimension drawings

connection diagrams

connectors and mating connectors

ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
10141584	Teach-in Adapter M12

for details: see accessories section

order reference	output circuit	sensitivity
IR18.D03K-11158154	current output	64 mA/mm (Range: 0,25 mm)
IR18.D03K-11158155	voltage output	40 V/mm (Range: 0,25 mm)

**Sd = 0 ... 8 mm**

- factor 1
- linear analog output
- external Teach-in

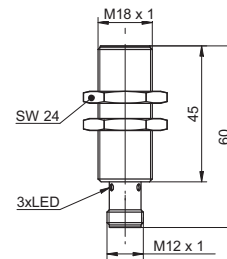
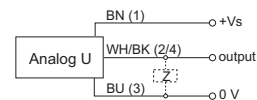
general data	
mounting type	flush
special type	linearized factor 1
measuring distance Sd	0 ... 8 mm
sensitivity	1,25 V/mm
resolution	< 0,02 mm (stat.) < 0,03 mm (dynam.)
repeat accuracy	< 0,03 mm
adjustment	external Teach-in
teach	1-point analog, 2-point analog, factory reset
linearity error	± 70 µm
temperature drift	± 3 % (Full Scale; S = 0 ... 6 mm) ± 5 % (Full Scale; S = 0 ... 8 mm)

electrical data	
response time (factory characteristic)	< 15 ms
voltage supply range +Vs	12 ... 36 VDC
current consumption max. (no load)	15 mA
output circuit	voltage output
output signal	0 ... 10 VDC
load resistance	> 4000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12
tightening torque max.	40 Nm

ambient conditions	
operating temperature	-25 ... +75 °C
protection class	IP 67

order reference	
IR18.D08F-11170540	

**dimension drawing****connection diagram****connectors and mating connectors**

ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
10141584	Teach-in Adapter M12

for details: see accessories section

**Sd = 0 ... 7 mm**

- outdoor design, robust steel housing
- protection class IP 69K & proTect+
- operating temperature -40 ... +70°C

**general data**

mounting type	quasi-flush
special type	Outdoor design Washdown design
measuring distance Sd	0 ... 7 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,015 mm
linearity error	± 350 µm
temperature drift	± 10 % (Full Scale)
approvals/certificates	Ecolab

electrical data

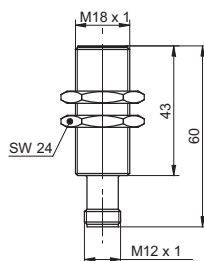
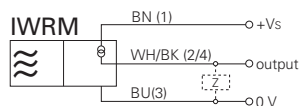
response time (factory characteristic)	< 2 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	40 mA
output circuit	current output
output signal	4 ... 20 mA
load resistance +Vs min.	< 330 Ohm
load resistance +Vs max.	< 1000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	LCP
housing material	stainless steel 1.4404 (V4A)
dimension	18 mm
housing length	60 mm
connection types	connector M12

ambient conditions

operating temperature	-40 ... +70 °C
cleaning temperature	70 ... +85 °C (30 min/day)
protection class	IP 68/69K & proTect+
vibration resistance	EN 61373: 2010 (category 3), 5h per axis (14.4 gRMS, 10-500 Hz, EN 60068-2-64)
shock resistance	EN 61373: 2010 (category 3), 10 bumps per axis (100 g, 6 ms, EN 60068-2-27)

order reference**IWRR 18I97T4/S14****dimension drawing****connection diagram****connectors and mating connectors**

ESG 34AY0200	Connector M12, 4 pin, straight, 2 m, V4A-PP
ESW 33AY0200	Connector M12, 4 pin, angular, 2 m, V4A-PP
ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)

for details: see accessories section

**Sd = 0 ... 8 mm**

- large measuring distance
- operating temperature -40 ... +70°C

**general data**

mounting type	quasi-flush
special type	Outdoor design
measuring distance Sd	0 ... 8 mm
resolution	< 0,005 mm (stat.) < 0,01 mm (dynam.)
repeat accuracy	< 0,015 mm
linearity error	± 400 µm
temperature drift	± 10 % (Full Scale)

electrical data

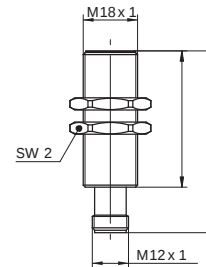
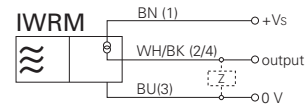
response time (factory characteristic)	< 2 ms
voltage supply range +Vs	15 ... 30 VDC
current consumption max. (no load)	40 mA
output circuit	current output
output signal	4 ... 20 mA
load resistance +Vs min.	< 330 Ohm
load resistance +Vs max.	< 1000 Ohm
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
material (sensing face)	PBT
housing material	brass nickel plated
dimension	18 mm
housing length	60 mm
connection types	connector M12

ambient conditions

operating temperature	-40 ... +70 °C
protection class	IP 67

order reference**IWRM 18I97T4/S14****dimension drawing****connection diagram****connectors and mating connectors**

ESG 34AE0500	Connector M12, 4 pin, straight, 5 m
ESG 34AE0500G	Connector M12, 4 pin, straight, 5 m, shielded

additional cable connectors and field wireable connectors: see accessories

Accessories

10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)

for details: see accessories section



Sd = 0 ... 4 mm

- ATEX certification
- very high resolution



general data

mounting type	quasi-flush
measuring distance Sd	0 ... 4 mm
resolution	< 0,001 mm (stat.) < 0,005 mm (dynam.)
repeat accuracy	< 0,01 mm
linearity error	± 160 µm
temperature drift	± 4 % (Full Scale)
approvals/certificates	ATEX 2D

electrical data

response time (factory characteristic)	< 2 ms
voltage supply range +Vs	15 ... 27 VDC
current consumption max. (no load)	20 mA
output circuit	current output
output signal	4 ... 20 mA
load resistance +Vs min.	< 330 Ohm
load resistance +Vs max.	< 1000 Ohm
Maximal zulässige Verlustleistung	< 1,35 W
short circuit protection	yes
reverse polarity protection	yes

mechanical data

type	cylindrical threaded
housing material	brass nickel plated
dimension	12 mm
housing length	50 mm
connection types	connector M12
tightening torque max.	15 Nm

ambient conditions

protection class	IP 67
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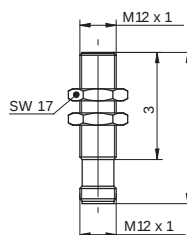
safe maximum values

marking	II 2D Ex tb IIIC T100°C Db IP6X
operating temperature Ta	-10 ... +50 °C

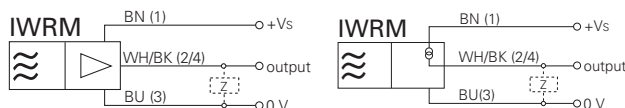
order reference

IWRM 12I9704/S14X

dimension drawing



connection diagrams



connectors and mating connectors

ESG 34SH0200X	Connector M12, 3 pin, straight, 2 m, only for ATEX applications with sensor IWRM 12I9704/S14X
ESW 33SH0200X	Connector M12, 3 pin, angular, 2 m, only for ATEX applications with sensor IWRM 12I9704/S14X

additional cable connectors and field wireable connectors: see accessories

Accessories

10151720	Sensofix series 12 round
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for details: see accessories section

order reference	page	order reference	page	order reference	page
E					
ES 14A PG7	208	ESW 31SH1000	207	IFFM 04N1501/O1L	87
ES 14C PG7	208	ESW 33AF0200	211	IFFM 04N3501/O1L	87
ES 18A PG7	208	ESW 33AF0500	211	IFFM 04P1501/O1L	87
ES 18C PG7	208	ESW 33AF1000	211	IFFM 04P3501/O1L	87
ES 21	205	ESW 33AF2500	211	IFFM 06N15A1/O1L	89
ES 21A	205	ESW 33AH0200	210	IFFM 06N15A3/O1L	88
ES 22	206	ESW 33AH0200G	210	IFFM 06N15A3/O1S05L	88
ES 22A	206	ESW 33AH0500	210	IFFM 06N35A1/O1L	89
ESG 05AP0200G	204	ESW 33AH0500G	210	IFFM 06N35A3/O1L	88
ESG 05SP0200	204	ESW 33AH1000	210	IFFM 06N35A3/O1S05L	88
ESG 05SP0500	204	ESW 33AH1000G	210	IFFM 06P15A1/O1L	89
ESG 05SP1000	204	ESW 33CH0200	210	IFFM 06P15A3/O1L	88
ESG 09SH0200	205	ESW 33CH0500	210	IFFM 06P15A3/O1S05L	88
ESG 09SH0500	205	ESW 33CH0500G	210	IFFM 06P35A1/O1L	89
ESG 09SH1000	205	ESW 33FH0200G	210	IFFM 06P35A3/O1L	88
ESG 32AH0200	206, 212	ESW 33FH0500G	210	IFFM 06P35A3/O1S05L	88
ESG 32AH0200G	207	ESW 33FH1000G	210	IFFM 08N1701/O1L	93
ESG 32AH0500	206, 212	ESW 33SH0200	210	IFFM 08N1701/O1S35L	95
ESG 32AH0500G	207	ESW 33SH0500	210	IFFM 08N1702/O1L	92
ESG 32AH1000	206, 212	ESW 33SH1000	210	IFFM 08N1703/O1L	91
ESG 32AH1000G	207	H		IFFM 08N1703/O2S35L	94
ESG 32SF0500	206	HI06-1H	214	IFFM 08N17A1/O1S35L	93
ESG 32SF1000	206	HI11-1H	215	IFFM 08N17A3/O1S35L	92
ESG 32SH0200	206, 212	HI17-1H	215	IFFM 08N17A5/O1S35L	91
ESG 32SH0500	206, 212	I		IFFM 08N17A6/KS35L	90
ESG 32SH0500G	207	IF08.D02S-F16.UA1Z.7WCV	179	IFFM 08N17A6/L	90
ESG 32SH1000	206, 212	IF08.D02S-F16.UA1Z.7WCV	179	IFFM 08N3701/O1L	93
ESG 32SH1000G/T	207	IF08.D02S-F16.UA1Z.7WLV	179	IFFM 08N3701/O1S35L	95
ESG 34AE0500	209	IF08.D02S-F16.UA1Z.7WMV	179	IFFM 08N3702/O1L	92
ESG 34AE0500G	210	IFBR 06N13T1/S14L-9	105	IFFM 08N3703/O1L	91
ESG 34AE1000	209	IFBR 06N33T1/S14L-9	105	IFFM 08N3703/O2S35L	94
ESG 34AE1000G	210	IFBR 06P13T1/S14L-9	105	IFFM 08N37A1/O1S35L	93
ESG 34AF0500	209	IFBR 06P33T1/S14L-9	105	IFFM 08N37A3/O1S35L	92
ESG 34AF1000	209	IFBR 11N13T1/L-9	107	IFFM 08N37A5/O1S35L	91
ESG 34AH0200	208	IFBR 11N13T1/S14L-9	107	IFFM 08N37A6/KS35L	90
ESG 34AH0200G	209	IFBR 11N17T1/L-9	106	IFFM 08N37A6/L	90
ESG 34AH0500	208	IFBR 11N17T1/S14L-9	106	IFFM 08P1701/O1L	93
ESG 34AH0500G	209	IFBR 11N17T1/S14L-9	106	IFFM 08P1701/O1S35L	95
ESG 34AH1000	208	IFBR 11N33T1/L-9	107	IFFM 08P1702/O1L	92
ESG 34AH1000G	209	IFBR 11N33T1/S14L-9	107	IFFM 08P1703/O1L	91
ESG 34CH0200	208	IFBR 11N33T1/S14L-9	107	IFFM 08P1703/O2S35L	94
ESG 34CH0200G	209	IFBR 11N37T1/L-9	106	IFFM 08P17A1/O1S35L	93
ESG 34CH0500	208	IFBR 11N37T1/S14L-9	106	IFFM 08P17A3/O1S35L	92
ESG 34CH0500G	209	IFBR 11P13T1/L-9	107	IFFM 08P17A5/O1S35L	91
ESG 34CH1000G	209	IFBR 11P13T1/S14L-9	107	IFFM 08P17A6/KS35L	90
ESG 34FH0200G	209	IFBR 11P17T1/L-9	106	IFFM 08P17A6/L	90
ESG 34FH0500G	209	IFBR 11P17T1/S14L-9	106	IFFM 08P3701/O1L	93
ESG 34FH1000G	209	IFBR 11P33T1/L-9	107	IFFM 08P3701/O1S35L	95
ESG 34SH0200	208	IFBR 11P33T1/S14L-9	107	IFFM 08P3702/O1L	92
ESG 34SH0500	208	IFBR 11P37T1/L-9	106	IFFM 08P3703/O1L	91
ESG 34SH1000	208	IFBR 11P37T1/S14L-9	106	IFFM 08P3703/O2S35L	94
ESW 05SP0200	204	IFBR 17N13T1/L-9	109	IFFM 08P37A1/O1S35L	93
ESW 05SP0500	204	IFBR 17N13T1/S14L-9	109	IFFM 08P37A3/O1S35L	92
ESW 08AH0200	205	IFBR 17N17T1/L-9	108	IFFM 08P37A5/O1S35L	91
ESW 08AH0500	205	IFBR 17N33T1/L-9	109	IFFM 08P37A6/KS35L	90
ESW 08SH0200	205	IFBR 17N33T1/S14L-9	109	IFFM 08P37A6/L	90
ESW 08SH0500	205	IFBR 17N37T1/L-9	108	IFFM 12N17A3/S05L	96
ESW 31AH0200	207	IFBR 17N37T1/S14L-9	108	IFFM 12N37A3/S05L	96
ESW 31AH0200G	207	IFBR 17P13T1/L-9	109	IFFM 12P17A3/S05L	96
ESW 31AH0500	207	IFBR 17P13T1/S14L-9	109	IFFM 12P37A3/S05L	96
ESW 31AH0500G	207	IFBR 17P17T1/L-9	108	IFFM 20N1501/S35L	97
ESW 31AH1000	207	IFBR 17P17T1/S14L-9	108	IFFM 20N17A3/S35L	98
ESW 31AH1000G	207	IFBR 17P33T1/L-9	109	IFFM 20N3501/S35L	97
ESW 31SH0200	207	IFBR 17P33T1/S14L-9	109	IFFM 20N37A3/S35L	98
ESW 31SH0200G	207	IFBR 17P37T1/L-9	108	IFFM 20P1501/S35L	97
ESW 31SH0500	207	IFBR 17P37T1/S14L-9	108	IFFM 20P17A3/S35L	98
ESW 31SH0500G	207	IFF 08.82.05	147	IFFM 20P3501/S35L	97
		IFFK 10E9101	148	IFFM 20P37A3/S35L	98
				IFR 04.82.05	140

order reference	page	order reference	page	order reference	page
IFR 05.82.05	140	IFRM 04N15A3/L	35	IFRM 05N15A5/Q	41
IFR 10.82.01	150	IFRM 04N15A3/S05L	35	IFRM 05N17A1/PL	46
IFR 10.82.05	150	IFRM 04N15A3/S35L	37	IFRM 05N17A1/S35L	47
IFR 10.82E05	149	IFRM 04N15A5/Q	34	IFRM 05N17A3/PL	45
IFRD 06N17A1/S35L	127	IFRM 04N15B1/KS35PL	33	IFRM 05N17A3/S05L	45
IFRD 06N17T1/S35	127	IFRM 04N15B1/L	33	IFRM 05N17A3/S35L	47
IFRD 06N37A1/S35L	127	IFRM 04N17A1/KS35PL	39	IFRM 05N35A1/KS35PL	43
IFRD 06N37T1/S35	127	IFRM 04N17A1/PL	39	IFRM 05N35A1/L	43
IFRD 06P17A1/S35L	127	IFRM 04N17A1/S35L	40	IFRM 05N35A3/KS35PL	42
IFRD 06P17T1/S35	127	IFRM 04N17A3/KS35PL	38	IFRM 05N35A3/L	42
IFRD 06P37A1/S35L	127	IFRM 04N17A3/PL	38	IFRM 05N35A3/S05L	42
IFRD 06P37T1/S35	127	IFRM 04N17A3/S05L	38	IFRM 05N35A3/S35L	44
IFRD 08N17A1/S35L	128	IFRM 04N17A3/S35L	40	IFRM 05N35A5/Q	41
IFRD 08N17T1/S35	128	IFRM 04N35A1/KS35PL	36	IFRM 05N37A1/PL	46
IFRD 08N37A1/S35L	128	IFRM 04N35A1/L	36	IFRM 05N37A1/S35L	47
IFRD 08N37T1/S35	128	IFRM 04N35A3/KS35PL	35	IFRM 05N37A3/PL	45
IFRD 08P17A1/S35L	128	IFRM 04N35A3/L	35	IFRM 05N37A3/S05L	45
IFRD 08P17T1/S35	128	IFRM 04N35A3/S05L	35	IFRM 05N37A3/S35L	47
IFRD 08P37A1/S35L	128	IFRM 04N35A3/S35L	37	IFRM 05P15A1/KS35PL	43
IFRD 08P37T1/S35	128	IFRM 04N35A5/Q	34	IFRM 05P15A1/L	43
IFRD 12N17A3/S14L	129	IFRM 04N35B1/KS35PL	33	IFRM 05P15A1/S35L	44
IFRD 12N17T3/S14	129	IFRM 04N35B1/L	33	IFRM 05P15A3/KS35PL	42
IFRD 12N37A3/S14L	129	IFRM 04N37A1/KS35PL	39	IFRM 05P15A3/L	42
IFRD 12N37T3/S14	129	IFRM 04N37A1/PL	39	IFRM 05P15A3/S05L	42
IFRD 12P17A3/S14L	129	IFRM 04N37A1/S35L	40	IFRM 05P15A3/S35L	44
IFRD 12P17T3/S14	129	IFRM 04N37A3/KS35PL	38	IFRM 05P15A5/Q	41
IFRD 12P37A3/S14L	129	IFRM 04N37A3/PL	38	IFRM 05P17A1/PL	46
IFRD 12P37T3/S14	129	IFRM 04N37A3/S05L	38	IFRM 05P17A1/S35L	47
IFRD 18N17A3/S14L	131	IFRM 04N37A3/S35L	40	IFRM 05P17A3/PL	45
IFRD 18N17T3/S14	131	IFRM 04P15A1/KS35PL	36	IFRM 05P17A3/S05L	45
IFRD 18N37A3/S14L	131	IFRM 04P15A1/L	36	IFRM 05P17A3/S35L	47
IFRD 18N37T3/S14	131	IFRM 04P15A1/S35L	37	IFRM 05P35A1/KS35PL	43
IFRD 18P17A3/S14L	131	IFRM 04P15A3/KS35PL	35	IFRM 05P35A1/L	43
IFRD 18P17T3/S14	131	IFRM 04P15A3/L	35	IFRM 05P35A1/S35L	44
IFRD 18P37A3/S14L	131	IFRM 04P15A3/S05L	35	IFRM 05P35A3/KS35PL	42
IFRD 18P37T3/S14	131	IFRM 04P15A3/S35L	37	IFRM 05P35A3/L	42
IFRH 08P1501/L	135	IFRM 04P15A5/Q	34	IFRM 05P35A3/S05L	42
IFRH 08P3501/L	135	IFRM 04P15B1/KS35PL	33	IFRM 05P35A3/S35L	44
IFRH 12P1501/L	136	IFRM 04P15B1/L	33	IFRM 05P35A5/Q	41
IFRH 12P3501/L	136	IFRM 04P17A1/KS35PL	39	IFRM 05P37A1/PL	46
IFRH 18P1501/L	136	IFRM 04P17A1/PL	39	IFRM 05P37A1/S35L	47
IFRH 18P3501/L	136	IFRM 04P17A1/S35L	40	IFRM 05P37A3/PL	45
IFRM 03N1501/KS35L	30	IFRM 04P17A3/KS35PL	38	IFRM 05P37A3/S05L	45
IFRM 03N1501/L	30	IFRM 04P17A3/PL	38	IFRM 05P37A3/S35L	47
IFRM 03N1503/Q	30	IFRM 04P17A3/S05L	38	IFRM 06N1701/KS35L	49
IFRM 03N1505/CS35L	31	IFRM 04P17A3/S35L	40	IFRM 06N1701/L	49
IFRM 03N1713/L	32	IFRM 04P35A1/KS35PL	36	IFRM 06N1707	132
IFRM 03N1713/QL	32	IFRM 04P35A1/L	36	IFRM 06N1713/KS35L	48
IFRM 03N3501/KS35L	30	IFRM 04P35A1/S35L	37	IFRM 06N1713/L	48
IFRM 03N3501/L	30	IFRM 04P35A3/KS35PL	35	IFRM 06N17A1/KS35L	50
IFRM 03N3503/Q	30	IFRM 04P35A3/L	35	IFRM 06N17A1/L	50
IFRM 03N3505/CS35L	31	IFRM 04P35A3/S05L	35	IFRM 06N17A1/S35L	50
IFRM 03N3713/L	32	IFRM 04P35A3/S35L	37	IFRM 06N17A3/S35L	49
IFRM 03N3713/QL	32	IFRM 04P35A5/Q	34	IFRM 06N17A4/L	51
IFRM 03P1501/KS35L	30	IFRM 04P35B1/KS35PL	33	IFRM 06N17A4/S35L	51
IFRM 03P1501/L	30	IFRM 04P35B1/L	33	IFRM 06N17A5/S35L	48
IFRM 03P1503/Q	30	IFRM 04P37A1/KS35PL	39	IFRM 06N3701/KS35L	49
IFRM 03P1505/CS35L	31	IFRM 04P37A1/PL	39	IFRM 06N3701/L	49
IFRM 03P1713/L	32	IFRM 04P37A1/S35L	40	IFRM 06N3713/KS35L	48
IFRM 03P1713/QL	32	IFRM 04P37A3/KS35PL	38	IFRM 06N3713/L	48
IFRM 03P3501/KS35L	30	IFRM 04P37A3/PL	38	IFRM 06N37A1/KS35L	50
IFRM 03P3501/L	30	IFRM 04P37A3/S05L	38	IFRM 06N37A1/L	50
IFRM 03P3503/Q	30	IFRM 04P37A3/S35L	40	IFRM 06N37A1/S35L	50
IFRM 03P3505/CS35L	31	IFRM 05N15A1/KS35PL	43	IFRM 06N37A3/S35L	49
IFRM 03P3713/L	32	IFRM 05N15A1/L	43	IFRM 06N37A4/L	51
IFRM 03P3713/QL	32	IFRM 05N15A3/KS35PL	42	IFRM 06N37A4/S35L	51
IFRM 04N15A1/KS35PL	36	IFRM 05N15A3/L	42	IFRM 06N37A5/S35L	48
IFRM 04N15A1/L	36	IFRM 05N15A3/S05L	42	IFRM 06P1701/KS35L	49
IFRM 04N15A3/KS35PL	35	IFRM 05N15A3/S35L	44	IFRM 06P1701/L	49

order reference	page	order reference	page	order reference	page
IFRM 06P1707	132	IFRM 08P3703/S14L	58	IFRM 18N17A4/L	73
IFRM 06P1713/KS35L	48	IFRM 08P3707	134	IFRM 18N17A4/S14L	73
IFRM 06P1713/L	48	IFRM 08P3713/KS35L	54	IFRM 18N17A5/L	71
IFRM 06P17A1/KS35L	50	IFRM 08P3713/L	54	IFRM 18N17A5/S14L	71
IFRM 06P17A1/L	50	IFRM 08P37A1/KS35L	56	IFRM 18N17M1/PL	122
IFRM 06P17A1/S35L	50	IFRM 08P37A1/L	56	IFRM 18N17M1/S14L	122
IFRM 06P17A3/S35L	49	IFRM 08P37A1/S35L	56	IFRM 18N33T1/PL	126
IFRM 06P17A4/KS35L	51	IFRM 08P37A3/S35L	55	IFRM 18N33T1/S14L	126
IFRM 06P17A4/L	51	IFRM 08P37A4/KS35L	57	IFRM 18N3701/S35L	74
IFRM 06P17A4/S35L	51	IFRM 08P37A4/L	57	IFRM 18N37A3/L	72
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