

Benefits:

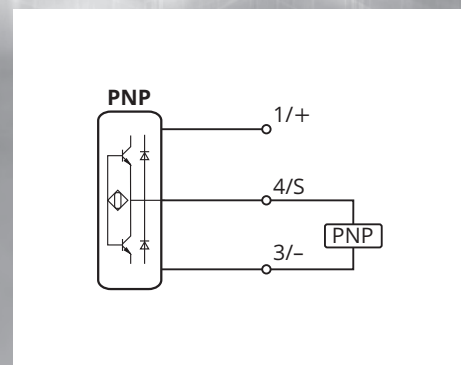
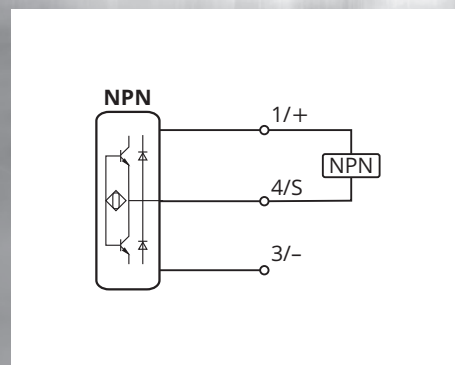
- ▶ Adjustable detection sensitivity
- ▶ Connector parallel or in right angle for optimal conduit routing
- ▶ Contamination-resistant and impact-resistant

Vorteile:

- ▶ Einstellbare Ansprechempfindlichkeit
- ▶ Parallele und rechtwinklige Stecker für eine optimale Leitungsführung
- ▶ Schmutz- und schlagunempfindlich

Data sheets are available on <http://xecro.com>.

Datenblätter sind auf <http://xecro.com> verfügbar.



All devices of this section may not be used if the safety of persons rely on their faultless function!

Alle Geräte dieses Abschnittes dürfen nicht verwendet werden, wenn die Sicherheit von Personen von deren fehlerlosen Funktion abhängt!



## Capacitive Sensors 3-Wire DC Ring Sensors

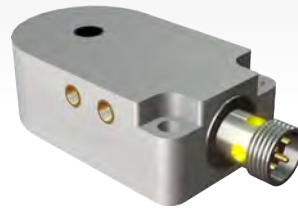
XECRO's capacitive ring sensors with static principle supervise liquids, e.g. in hoses and non-metallic tubes. The ring diameters from 6 to 21 mm include most of the common pipes of plastics or glass. The detection sensitivity can be adjusted, so that different materials and thicknesses can be cut off in a wide range. XECRO's capacitive ring sensors have a contamination-resistant and impact-resistant housing made of polyamid 6,6 (Nylon®) of the IP67 protection class. For an optimal conduit routing, the M12 connector is mounted in a right angle or parallel to the direction of the conduit.

XECROs kapazitive Ringsensoren mit statischem Arbeitsprinzip überwachen Flüssigkeiten, zum Beispiel in Schläuchen und nichtmetallischen Rohren. Mit 6...21 mm Ringdurchmesser umfassen sie die meisten marktüblichen Leitungen aus Kunststoff oder Glas. Die Ansprechempfindlichkeit kann eingestellt werden, so dass sich unterschiedliche Materialien und Wandstärken in weiten Bereichen ausblenden lassen. XECROs kapazitive Ringsensoren haben ein schmutz- und schlagunempfindliches Gehäuse aus Polyamid 6,6 (Nylon®) der Schutzklasse IP67. Für eine optimale Leitungsführung ist der M12-Stecker rechtwinklig oder parallel zum Leitungsverlauf angebracht.

## Capacitive Proximity Switch 3-Wire DC Ring Sensors

## Kapazitive Näherungsschalter 3-Leiter DC Ringsensoren

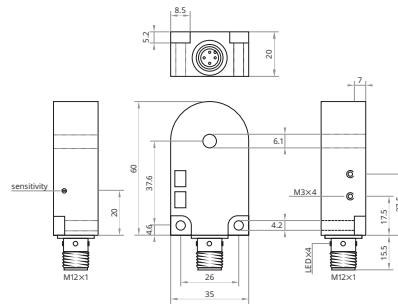
adjustable  
einstellbar  
Ø 6.1 mm



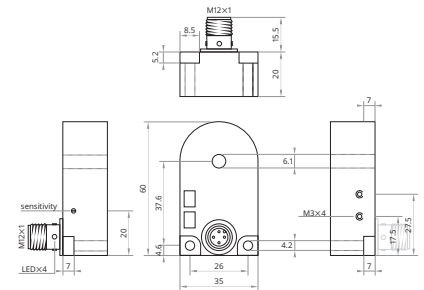
adjustable  
einstellbar  
Ø 6.1 mm



static  
statisch



static  
statisch



Resolution	Auflösung	adjustable	einstellbar	adjustable	einstellbar
Operating voltage	Betriebsspannung	10...30 V <sub>DC</sub>		10...30 V <sub>DC</sub>	
Reverse polarity protection	Verpolungsschutz	built-in	integriert	built-in	integriert
Current consumption	Stromverbrauch	<10 mA		<10 mA	
Current load capability	Ausgangselastbarkeit	200 mA		200 mA	
Short circuit protection	Kurzschlusschutz	built-in	integriert	built-in	integriert
Voltage drop	Spannungsabfall	<2 V @ 200 mA		<2 V @ 200 mA	
Adjustment	Einstellung	multi-turn pot	Mehrgangpoti	multi-turn pot	Mehrgangpoti
Operating temperature	Betriebstemperatur	-25...+70 °C		-25...+70 °C	
Protection class	Schutzklasse	IP67		IP67	
Ring material	Ringwerkstoff	PBT		PBT	
Housing material	Gehäusewerkstoff	PA 6,6		PA 6,6	
Switching indicator	Schaltanzeige	built-in	integriert	built-in	integriert
Connection	Anschluss	conn. M12	Stecker M12	conn. M12	Stecker M12
Article code PNP, NO	┌	CR06S-PO-A12		CR06S-PO-RA12	
Article code PNP, NC	└	CR06S-PC-A12		CR06S-PC-RA12	
Article code NPN, NO	┌	CR06S-NO-A12		CR06S-NO-RA12	
Article code NPN, NC	└	CR06S-NC-A12		CR06S-NC-RA12	

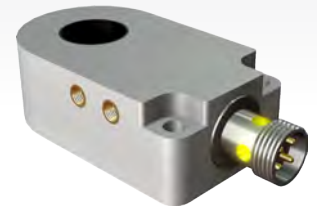
adjustable  
einstellbar  
Ø 10.1 mm



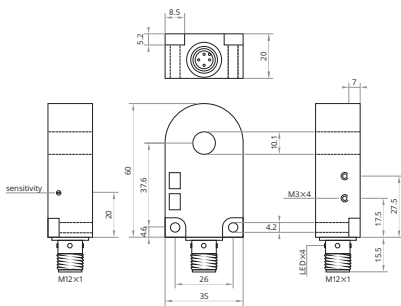
adjustable  
einstellbar  
Ø 10.1 mm



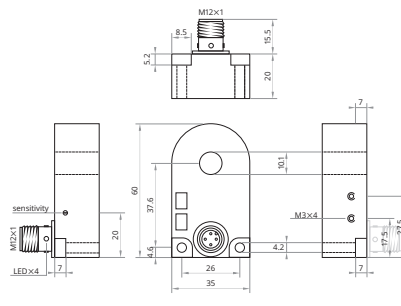
adjustable  
einstellbar  
Ø 15.1 mm



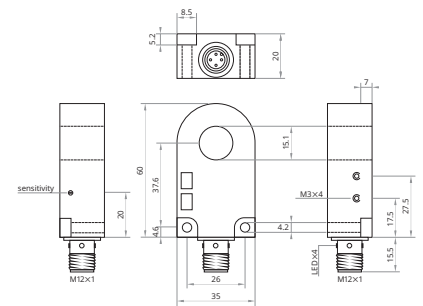
static  
statisch



static  
statisch



static  
statisch



adjustable	einstellbar	adjustable	einstellbar	adjustable	einstellbar
10...30 V <sub>DC</sub>		10...30 V <sub>DC</sub>		10...30 V <sub>DC</sub>	
built-in	integriert	built-in	integriert	built-in	integriert
<10 mA		<10 mA		<10 mA	
200 mA		200 mA		200 mA	
built-in	integriert	built-in	integriert	built-in	integriert
<2 V @ 200 mA		<2 V @ 200 mA		<2 V @ 200 mA	
multi-turn pot	Mehrgangpoti	multi-turn pot	Mehrgangpoti	multi-turn pot	Mehrgangpoti
-25...+70 °C		-25...+70 °C		-25...+70 °C	
IP67		IP67		IP67	
PBT		PBT		PBT	
PA 6,6		PA 6,6		PA 6,6	
built-in	integriert	built-in	integriert	built-in	integriert
conn. M12	Stecker M12	conn. M12	Stecker M12	conn. M12	Stecker M12
CR10S-PO-A12		CR10S-PO-RA12		CR15S-PO-A12	
CR10S-PC-A12		CR10S-PC-RA12		CR15S-PC-A12	
CR10S-NO-A12		CR10S-NO-RA12		CR15S-NO-A12	
CR10S-NC-A12		CR10S-NC-RA12		CR15S-NC-A12	

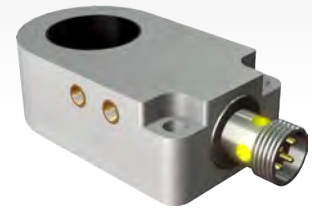
## Capacitive Proximity Switch 3-Wire DC Ring Sensors

## Kapazitive Näherungsschalter 3-Leiter DC Ringsensoren

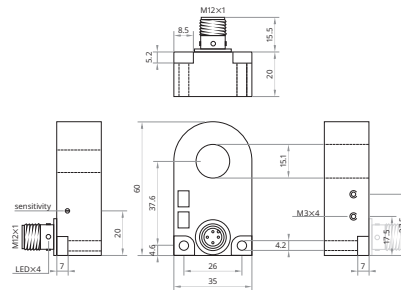
adjustable  
einstellbar  
Ø 15.1 mm



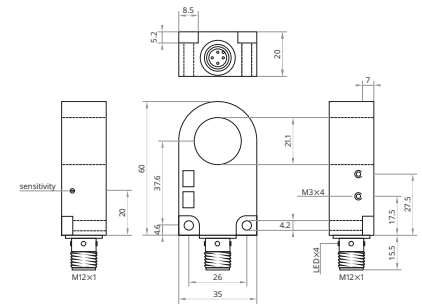
adjustable  
einstellbar  
Ø 21.1 mm



static  
statisch



static  
statisch

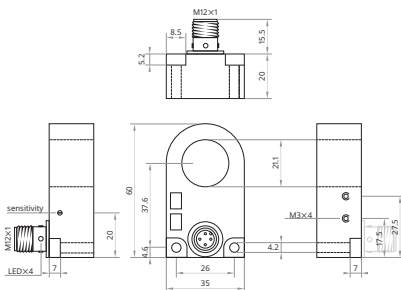


Resolution	Auflösung	adjustable	einstellbar	adjustable	einstellbar
Operating voltage	Betriebsspannung	10...30 V <sub>DC</sub>		10...30 V <sub>DC</sub>	
Reverse polarity protection	Verpolungsschutz	built-in	integriert	built-in	integriert
Current consumption	Stromverbrauch	<10 mA		<10 mA	
Current load capability	Ausgangsbelastbarkeit	200 mA		200 mA	
Short circuit protection	Kurzschlusschutz	built-in	integriert	built-in	integriert
Voltage drop	Spannungsabfall	<2 V @ 200 mA		<2 V @ 200 mA	
Adjustment	Einstellung	multi-turn pot	Mehrgangpoti	multi-turn pot	Mehrgangpoti
Operating temperature	Betriebstemperatur	-25...+70 °C		-25...+70 °C	
Protection class	Schutzklasse	IP67		IP67	
Ring material	Ringwerkstoff	PBT		PBT	
Housing material	Gehäusewerkstoff	PA 6,6		PA 6,6	
Switching indicator	Schaltanzeige	built-in	integriert	built-in	integriert
Connection	Anschluss	conn. M12	Stecker M12	conn. M12	Stecker M12
Article code PNP, NO	—/—	CR15S-PO-RA12		CR21S-PO-A12	
Article code PNP, NC	—/—	CR15S-PC-RA12		CR21S-PC-A12	
Article code NPN, NO	—/—	CR15S-NO-RA12		CR21S-NO-A12	
Article code NPN, NC	—/—	CR15S-NC-RA12		CR21S-NC-A12	

adjustable  
einstellbar  
Ø 21.1 mm



static  
statisch



adjustable	einstellbar
10...30 V <sub>DC</sub>	
built-in	integriert
<10 mA	
200 mA	
built-in	integriert
<2 V @ 200 mA	
multi-turn pot	Mehrgangpoti
-25...+70 °C	
IP67	
PBT	
PA 6,6	
built-in	integriert
conn. M12	Stecker M12
CR21S-PO-RA12	
CR21S-PC-RA12	
CR21S-NO-RA12	
CR21S-NC-RA12	

Series	Housing size	Special feature — only IR: operating principle	Mounting	Sensing distance	Special feature — only IHT and IA: max. temp., current, voltage	Output polarity	Output function	Overall length	Special feature — only IHP: maximum pressure	Special feature — only IPS88: sensing face position
1	2	3	4	5	6	7	8	9	10	11
IPS	D3	<none>	-	06	<none>	P	O	18	<none>	<none>
IMF	4	D	S	08	A	N	C	22	S	C
IWI	D4	S	N	1	B	A	CO	30		
IHT	5			1.5	C	D	S	32		
IHP	55			2	I	NA	<none>	...		
IA	D6			3	V	<none>		94		
IR	8			...				138		
	88			22				010		
	12	D: dynamic S: static	S: flush, semi-flush N: non-flush	25	A: 120 °C B: 150 °C C: 180 °C I: current V: voltage	P: PNP N: NPN A: 250 V <sub>AC</sub> D: 55 V <sub>DC</sub> NA: NAMUR U: Universal AC and DC	O: normally open C: normally closed CO: normally closed + open (2 outputs) S: switch between normally closed↔open (1 output)	020	<none> 500 bar S: 1000 bar	C: center
	18			30				420		
	1628			40				L		
	30			50				S		
	40							<none>		
		D: threadless		06: 0.6mm 08: 0.8mm						

### ↑ Legend of the article codes

The article code consists of 8...16 parameters and two hyphens. Not all parameters are applied in each article code. “...” means more numeric values. You cannot generate new article codes from the legend. In particular, only the connection suffixes shown in the list on the right side exist. Mind O≠0, I≠1, S≠5, B≠8.

### ↓ Series overview

The possible values of some parameters of the sensors of a series are written in columns. Their order corresponds to that in the article code (exception: special features), so that an article code can be composed vertically. The blue numbers on the left side are equal to the column numbers of the legend of the article codes. Explications and parameters which are no component of an article code are gray.

Series	3-wire DC Miniature	3-wire DC				3-wire DC Metal Face
<b>1 Series prefix</b>		IPS				IMF
<b>2 Housing size</b> ∅ (∅ cuboid) [mm]	4, 5, 55, D3, D4 (D: threadless, 55: 5×5∅)	D6, 8, 88, 12, 18, 30 (D: threadless, 88: 8×8∅)		1628 (16×28∅)	40 (40×40∅)	8, 12, 18, 30
<b>4 Mounting</b>	S flush	S flush	S semi-flush	N non-flush	S flush or semi-flush, N non-flush	S flush, N non-flush
<b>5 Sensing distance</b> [mm]	0.6, 0.8, 1, 1.5	1, 2, 3, 4, 5, 8, 10, 16	3, 4, 6, 8, 12, 15, 22	2, 4, 6, 8, 10, 15, 16, 25, 40, 50	1, 2, 3, 4, 6	15, 20, 30, 40 2, 4, 6, 8, 10, 15
<b>7 Output polarity</b>		P PNP, N NPN				
<b>8 Output function</b>	C normally closed, O normally open	C normally closed, O normally open, CO normally closed + open (2 outputs)		C normally closed, O normally open	CO normally closed + open (2 outputs)	O normally open, C normally closed
<b>Sensing face material</b>	POM	POM, SS304			PBT	SS304
<b>Housing material</b>	SS304, brass	SS304, brass			PBT	SS304
<b>9 Overall length</b> [mm]	26, 40	18, 22, 30, 32, 35, 40, 45, 48, 50, 55, 60, 68, 70, 79	18, 22, 30, 32, 35, 45, 48, 50, 55, 60, 68, 70	18, 30, 32, 45, 50, 53, 55, 60, 68, 70, 79	S 28	L 142 30, 35, 45, 48, 50, 55, 60, 68, 70, 79
<b>12...16 Connection</b>	M8, 300 mm PUR cable	M8, M12, 300 mm PUR cable, PVC ultra flex cable		M8, 300 mm PUR cable, PVC ultra flex cable	PG13	M8, M12, PVC ultra flex cable
<b>3, 6, 10, 11 Special features</b>		—				
<b>Operating voltage</b>		10...30 V <sub>DC</sub>				

Connection					
Connector in right angle — only RA12	Switching indicator LED	Cable length [m], but 3 dm and 20 cm	cable material	connector type	The following compositions of connection suffixes exist:
12 R <none>	13 A N <none>	14 2 3 4* 5* 6* 10* 20 <none>	15 P S T U <none>	16 8 12 PG13 F2 <none>	A8: metric screw thread M8, amber LED N8: metric screw thread M8, no LED A12: metric screw thread M12, amber LED RA12: metric screw thread M12 in right angle, amber LED N12: metric screw thread M12, no LED A2P: 2 m PVC cable, amber LED N2P: 2 m PVC cable, no LED A2S: 2 m silicone cable, amber LED N2S: 2 m silicone cable, no LED A2T: 2 m PTFE cable, amber LED N2T: 2 m PTFE cable, no LED 3P8: 300 mm PVC cable ("pigtail") with metric screw thread M8 connector 3U8: 300 mm PUR cable ("pigtail") with metric screw thread M8 connector R3U8: 300 mm PUR cable ("pigtail") in right angle with metric screw thread M8 connector 3P12: 300 mm PVC cable ("pigtail") with metric screw thread M12 connector PG13: cable gland PG13.5 ("panzergewinde") with terminal 20F2: two 200 mm stranded wires A4P, A5P, A6P, A10P, N4P, N5P, N6P, N10P on request for ≥10 units of the same article.
R: connector in right angle	A: amber LED N: no LED	* On request for ≥10 units of the same article — only in PVC	P: polyvinyl chloride (PVC) S: silicone cable T: PTFE cable U: polyurethan cable (PUR)	8: M8 connector 12: M12 connector PG13: cable gland PG13.5 with terminal	

↑ Artikelcodelegende

Der Artikelcode besteht aus 8...16 Parametern und zwei Bindestrichen. Nicht alle Parameter werden in jedem Artikelcode verwendet. «...» steht für weitere Zahlenwerte. Aus der Legende können Sie keinen neuen Artikelcode bilden. Insbesondere gibt es nur die Anschluss-suffixe, die in der Liste rechts stehen. O≠0, I≠I≠1, S≠5, B≠8 beachten.

↓ Baureihenübersicht

Die möglichen Werte einiger Parameter der Sensoren einer Baureihe stehen in Spalten. Ihre Reihenfolge entspricht der im Artikelcode (Ausnahme: Sondermerkmale), so dass ein Artikelcode senkrecht zusammengesetzt werden kann. Die blauen Zahlen links gleichen den Spaltennummern der Artikellegende. Grau sind Erklärungen und Parameter, die nicht Teil des Artikelcodes sind.

3-wire DC Weld-Field Immune	3-wire DC High Temperature	3-wire DC High Pressure	3-wire DC Analog Output	3-wire DC Ring Sensors	2-wire DC	2-wire AC	2-wire UC	2-wire NAMUR Intrinsic. Safe
IWI	IHT	IHP	IA	IR	IPS			D4, 5, 8, 12, 18, 30
8, 12, 18, 30		12, 14	8, 12, 18, 30	06, 10, 15, 21 (ring diameters [mm]: 6.1, 10.1, 15.1 21.1)	8, 12, 18, 30, 40 (40: 40×40□)			
S flush, N non-flush		S flush	S flush, N non-flush	—	S flush, N non-flush			
1, 2, 4, 5, 8, 10, 15	2, 4, 5, 8, 10, 15	1.5, 3	0.6...3, 1.1...6, 3.1...10, 7.3...20, 17.6...40	—	1, 2, 4, 5, 8, 10, 15, 16, 25, 30	2, 4, 5, 8, 10, 15, 16, 20, 25	2, 4, 5, 8, 10, 15, 16, 20, 25, 30	0.8, 1, 2, 4, 5, 8, 10, 15
P PNP, N NPN			—	—	D 55 V <sub>DC</sub>	A 250 V <sub>AC</sub>	U Universal AC and DC	NA NAMUR
C normally closed, O normally open			—	C norm.closed, O norm. open, S normally open↔closed (switch)	C normally closed, O normally open			—
PTFE		ceramic, SS304	POM	PBT (ring material)	POM, PBT			POM
SS304, brass, PTFE coated	SS304		SS304, brass	PA 6.6	SS304, brass, PBT	brass, PBT		SS304, brass
22, 30, 45, 50, 60	45, 50, 55	43, 47, 56, 57, 65, 69, 78, 93, 94, 138	voltage or current: 010, 020, 420	impulse lengthening: <none>, 150	45, 50, 50, 55, 60, 68, 70, 79, L	55, 60, 68, 79, L	35, 50, 55, 68, 79, L	9, 20, 25, 30, 40
M8, M12, PUR ultra flex	PTFE, silicone	M12, PVC ultra flex cable	M8, M12, PVC ultra flex cable	M12	M8, M12, PVC ultra flex cable, PG13 terminal	PVC ultraflex cable, PG13 terminal	M12, PVC ultra flex cable, PG13 terminal	PVC ultra flex, PUR ultra flex
—	max. temperature: A 120 °C, B 150 °C, C 180 °C	max. pressure: <none> 500 bar, S 1000 bar	V 10...0 V, I 20...0 mA, I 20...4 mA	detection principle: S static, D dynamic	—			
		10...30 V <sub>DC</sub>			10...55 V <sub>DC</sub>	20...250 V <sub>AC</sub>	24...255 V <sub>UC</sub>	6...12 V <sub>DC</sub> , NAMUR



Series	Housing size	Special feature — only CR: operating principle	Mounting	Sensing distance	Special feature — only CHT: maximal temperature	Output polarity	Output function	Overall length	Special feature: housing material
1	2	3	4	5	6	7	8	9	10
CS	06	<none>	-	2	<none>	P	O	7	<none>
CHT	8	S	S	3	A	N	C	45	P
CR	10		N	4	B	A		60	
IHT	12			6	C			70	
IHP	15			8				80	
IA	18			10				90	
IR	21			12				L	
	30	S: static	S: flush, semi-flush N: non-flush	15	A: 120 °C B: 150 °C	P: PNP N: NPN A: AC	O: normally open C: normally closed		P: PBT T: PTFE Only 2-wire AC: <none>: brass
	3050			20					
	40			22					
				25					
				30					
				35					

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#### ↓ Series overview

The possible values of some parameters of the sensors of a series are written in columns. Their order corresponds to that in the article code (exception: special features), so that an article code can be composed vertically. The blue numbers on the left side are equal to the column numbers of the legend of the article codes. Explications and parameters which are no component of an article code are gray.

Series	3-wire DC	3-wire DC High Temperature	3-wire DC Chemical-Resistant	3-wire DC Ring Sensors	2-wire AC
<b>1 Series prefix</b>	CS	CHT	CS	CR	CS
<b>2 Housing size Ø (∅ cuboid) [mm]</b>	8, 12, 30, 3050, 40 (3050: 30×50∅, 40: 40×40∅)	8, 12, 18, 30	18, 30	06, 10, 15, 21 (ring diameters [mm]: 6.1, 10.1, 15.1 21.1)	18, 30, 40 (40: 40×40∅)
<b>4 Mounting</b>	S flush, N non-flush			—	S flush, N non-flush
<b>5 Sensing distance [mm]</b>	2, 4, 6, 8, 10, 12, 15, 20, 25, 30, 35	1, 2, 4, 8, 15, 20, 30,	12, 20, 25, 30	3, 4, 6, 8, 12, 15, 22	8, 15, 20, 30
<b>7 Output polarity</b>	P PNP, N NPN				A 250 V <sub>AC</sub>
<b>8 Output function</b>	C normally closed, O normally open, CO normally closed + open (2 outputs)	C normally closed, O normally open			
<b>Sensing face material</b>	POM	PTFE		PBT (ring material)	POM
<b>Housing material</b>	SS304, brass, PBT	brass	PTFE	PA 6.6	brass, PBT
<b>9 Overall length [mm]</b>	7, 45, 60, 70, 80	60, 80	80	—	90, L
<b>11...15 Connection</b>	M8, M12, PVC ultra flex cable, PG13 terminal	PTFE cable, silicone cable		M12	M12, PVC ultra flex cable, PG13 terminal
<b>3, 6, 10 Special features</b>	housing material: <none> brass, P PBT	max. temperature: A 120 °C, B 150 °C	housing material: T PTFE	detection principle: S static	housing material: <none> brass, P PBT, T PTFE
<b>Operating voltage</b>	10...30 V <sub>DC</sub>				

Connection					
Connector in right angle — only RA12	Switching indicator LED	Cable length [m], but 3 for 300 mm	cable material	connector type	The following compositions of connection suffixes exist:
11	12	13	14	15	
-	R	2	P	8	A8: metric screw thread M8, amber LED
<none>	A	3	S	12	N8: metric screw thread M8, no LED
	N	4*	T	PG13	A12: metric screw thread M12, amber LED
	<none>	5*	U	<none>	RA12: metric screw thread M12 in right angle, amber LED
		6*	<none>		N12: metric screw thread M12, no LED
		10*			A2P: 2 m PVC cable, amber LED
		<none>			N2P: 2 m PVC cable, no LED
					A2S: 2 m silicone cable, amber LED
					N2S: 2 m silicone cable, no LED
					A2T: 2 m PTFE cable, amber LED
					N2T: 2 m PTFE cable, no LED
					3P8: 300 mm PVC cable ("pigtail") with metric screw thread M8 connector
					3U8: 300 mm PUR cable ("pigtail") with metric screw thread M8 connector
					R3U8: 300 mm PUR cable ("pigtail") in right angle with metric screw thread M8 connector
					3P12: 300 mm PVC cable ("pigtail") with metric screw thread M12 connector
					PG13: cable gland PG13.5 ("panzergewinde") with terminal
					A4P, A5P, A6P, A10P, N4P, N5P, N6P, N10P on request for ≥ 10 pieces of the same article.




R: connector in right angle	A: amber LED N: no LED	* On request for ≥ 10 pieces of the same article — only in PVC	P: polyvinyl chloride (PVC) S: silicone cable T: PTFE cable U: polyurethan cable (PUR)	8: M8 connector 12: M12 connector PG13: cable gland PG13.5 with terminal
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↑ Artikelcodelegende

Der Artikelcode besteht aus 8...16 Parametern und zwei Bindestrichen. Nicht alle Parameter werden in jedem Artikelcode verwendet. Aus der Legende können Sie keinen neuen Artikelcode bilden. Insbesondere gibt es nur die Anschlusssuffixe, die in der Liste rechts stehen. O≠0, I≠I≠1, S≠5, B≠8 beachten.

↓ Baureihenübersicht (linke Seite unten)

Die möglichen Werte einiger Parameter der Sensoren einer Baureihe stehen in Spalten. Ihre Reihenfolge entspricht der im Artikelcode (Ausnahme: Sondermerkmale), so dass ein Artikelcode senkrecht zusammengesetzt werden kann. Die blauen Zahlen links gleichen den Spaltennummern der Artikellegende. Grau sind Erklärungen und Parameter, die nicht Teil des Artikelcodes sind.

<b>Pinout</b> Inductive and capacitive sensors  <b>Belegung</b> Induktive und kapazitive Sensoren	<b>M8-3</b>	<b>M8-4</b>	<b>M12-4</b>
	black schwarz  brown braun      blue blau	white weiß      black schwarz  brown braun      blue blau	black schwarz      blue blau  brown braun      white weiß