



MAGNETIC SENSORS

The magnetic sensors range is basically made by two categories

DETECTION OF EXTERNAL MAGNETS

Very long sensing distance even with small sensors are possible. In order to choose properly the magnet see page C-12. In many cases the sensor is used to detect a magnet embedded inside other devices such as pneumatic cylinders, specifically made for this purpose.

There are two basic technologies : Reed contact or solid state.

Reed contact

They are the cheapest solution. Being made with the same production process as for the inductive sensors, they join the advantages of a robust and sealed construction to the electromechanical devices performances:

- no need of power supply
- no voltage drop
- no minimum load required
- no limitations in series and parallel connection

It must be observed that eventhough the number of cycles of a Reed contact is very high, that's not infinite. They are hence not suited for applications with high working frequency or requiring fast response time. It is also highly recommended to avoid to apply excessive mechanical strenght on the body of the sensors.

Working principle:

A Reed contact embedded inside the sensor detects the magnetic field and closes a contact able to drive directly the load. Versions with three wires or without LED don't have voltage drop on contacts. On the two wires with LED version you must consider a little voltage drop, to be considered for the series connection of more sensors.

Amplified in d.c. or static output

They are much more sensitive than the Reed contacts, as showed on page C-12 table.

They have all the advantages of the solid state sensors :

- Illimited number of cycles
- Very fast switching time
- High working frequencies
- High resistance against vibrations and mechanical strenght on the housing

Working principle:

An electronic, solid state component detects the magnetic field and drives amplifier stage, LED and short circuit protection.

DETECTION OF A FERROMAGNETIC TARGET

These sensors are able to detect only ferromagnetic objects. They are mainly used as selective sensors on working plants for aluminium, brass, copper, where bits of metal would create unavoided signals using standard inductive sensors.

Working principle:

An electronic, solid state component, internally polarized by an embedded magnet, detects the magnetic field variation due to the influence of an external ferromagnetic object, driving the amplifier, LED and short circuit protection.

MAGNETIC SENSORS CYLINDRICAL AND RECTANGULAR

BMS = activated by external magnet
DCH = activated by ferromagnetic target

Diameter of cylindrical sensors.
 For other types, change the number with the following:

Z = rectangular plastic 16 x 28 x 10
W = rectangular plastic 19 x 28,5 x 10,5

BMS Z / 4 6 0 9 KS -5 PUR

3 = with connector M12 x 1
6 = standard type cable output
9 = with connector M8 x 1
***** = male connector cabled on sensor (see pag. H-1)

0 = NO (normally open output)
1 = NC (normally closed output)
2 = NO + NC (complementary outputs)

0 = REED contact
2 = REED contact 2-wire with LED
8 = NPN static output
2 = NPN static output open collector
9 = PNP static output
1 = PNP static output open collector

L = smooth body
J = degree of protection IP68
K = protection against short circuit and overload
S = LED output status
T = high temperatures version
P = high current REED contact

Cable length (if required different than standard 2m)

MAGNETIC SENSORS FOR PNEUMATIC CYLINDERS WITH T SLOT

BMT = activated by external magnet for pneumatic cylinders with T slot

BMT	2	0	3	F	1
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1 = black color housing
2 = blue color housing

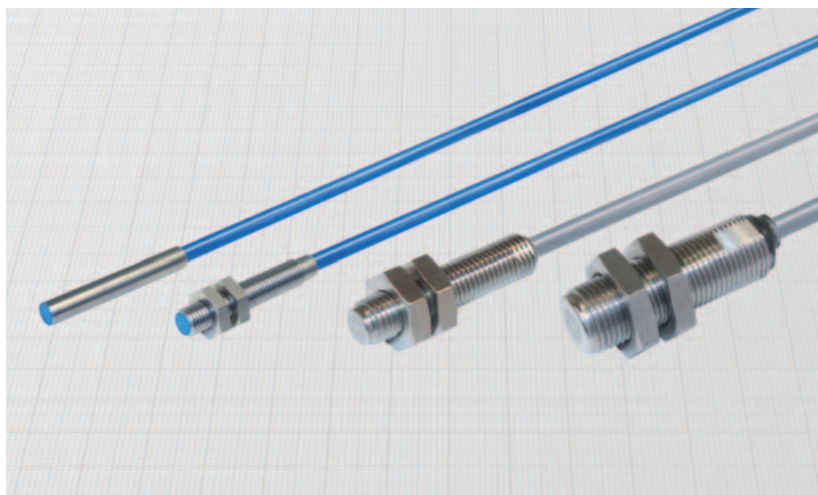
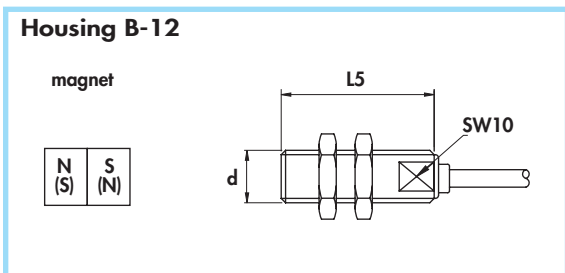
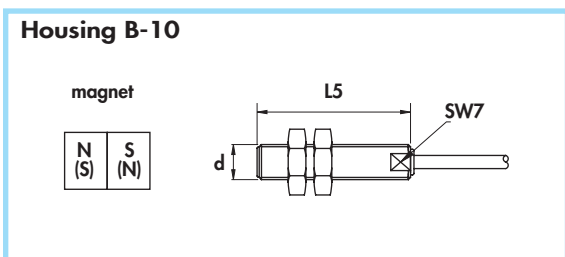
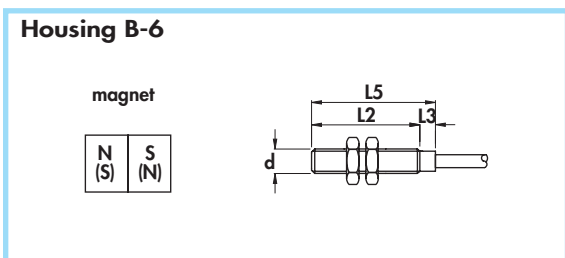
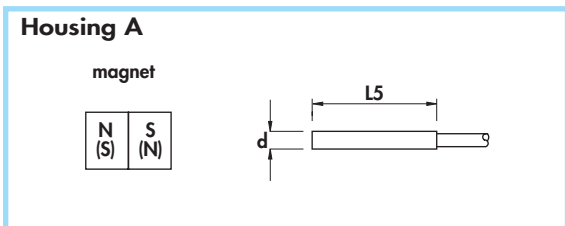
0 = NO (normally open output)
1 = NC (normally closed output)

2 = REED contact 2-wire with LED
3 = REED contact 3-wire
4 = REED contact 2-wire for high temperatures
8 = NPN static output
9 = PNP static output

- = PVC cable
R = PUR cable
F = PUR cable with M8 male connector with fixed nut (for 2-wire version connected on pins 1-4)
C = PUR cable with M8 male connector with fixed nut (2-wire version connected on pins 1-3)
N = PUR cable with M8 male connector with rotating nut
H = PUR cable with M12 male connector with rotating nut

Cable length (if required different than standard 2m)

- REED CONTACT 2 wires •**
Detection of magnets •
Cable output •



Diameter	M5 x 0,5	M8 x 1	M12 x 1
Nut	Size	SW7	SW13
	Thickness mm	2,5	4
Max tightening torque Nm	2	10	20

Materials:

- Cable: 2m PVC CEI 20 - 22 II; 90°C; 300 V; O.R.
- Housing: stainless steel

General Features:

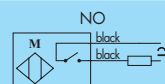
These sensors give on the output a contact activated by an external magnetic field, not depending by the polarity of the field. The activation distance depends by the power of the magnet (see on page C-12), which must be ordered separately. Reed contacts allows to drive directly dc loads (PNP/NPN) or ac loads. Diameters 8 and 12 mm are completely in stainless steel and are able to withstand high pressures on the housing.

Technical data:

- Max working voltage: 50 Vac/75 Vdc normally open
- Output logic: 0,1 Ω
- Contact resistance max: 1 ms
- Operate time max: 0,4 ms
- Release time max: -25 ÷ + 85°C
- Temperature range: front side (diameters 8 and 12 mm): IP68
- Degree of protection: back side: IP67
- Pressure on the front side max (diameters 8 and 12 mm): 150 bar
- Cable conductor cross section: 0,15 mm² on 4 and 5 mm
- 0,35 mm² on 6,5 ÷ 12 mm

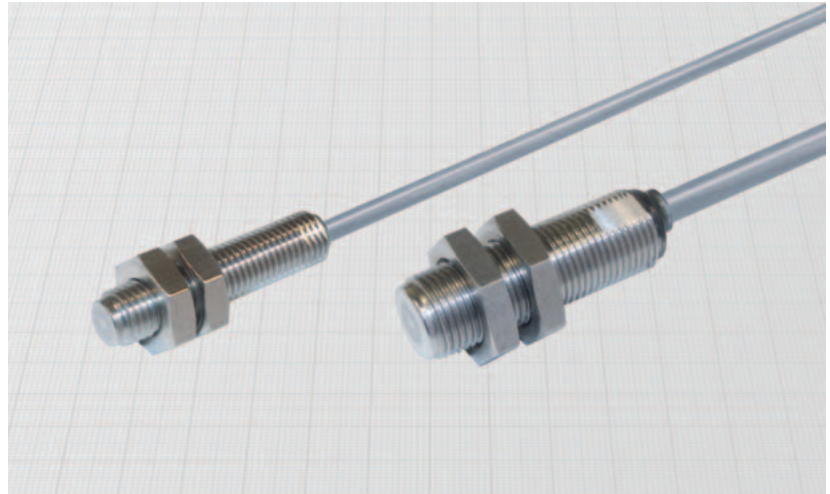
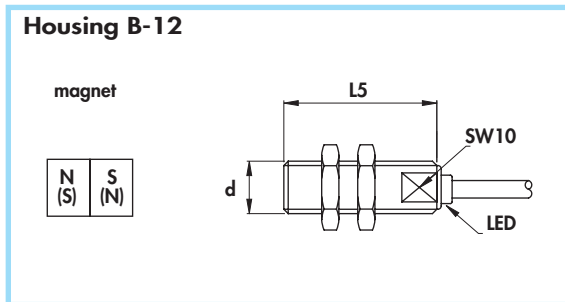
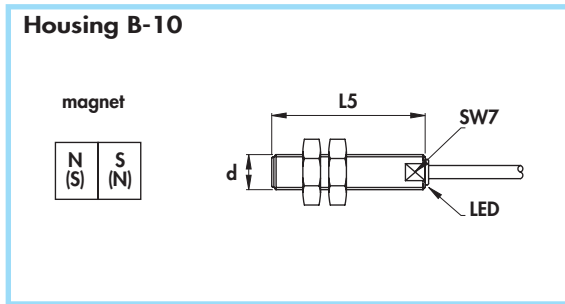
Housing	L1	L2	L3	L4	L5	Cable diameter	Body diameter (d)	Max switching frequency (f)	Rated operational current (I _e)	ORDERING REFERENCES
	mm	mm	mm	mm	mm					
A	-	-	-	-	25	3	4	0,5	500	BMS4/4600L
B-6	-	20	5	-	25	3	M5 x 0,5	0,5	500	BMS5/4600
A	-	-	-	-	30	4	6,5	0,5	500	BMS6,5/4600L
B-10	-	-	-	-	35	4	M8 x 1	0,5	500	BMS8/4600
B-12	-	-	-	-	35	4	M12 x 1	0,5	500	BMS12/4600

ORDERING REFERENCES



CYLINDRICAL MAGNETIC SENSORS IN METAL HOUSING

- REED CONTACT 2 and 3 wires with LED
- Detection of magnets
- Cable output



Diameter	M8 x 1	M12 x 1
Nut	Size	SW13
	Thickness mm	4
Max tightening torque Nm	10	20

Materials:

- Cable: 2m PVC CEI 20 - 22 II; 90°C; 300 V; O.R.
- Housing: stainless steel

General Features:

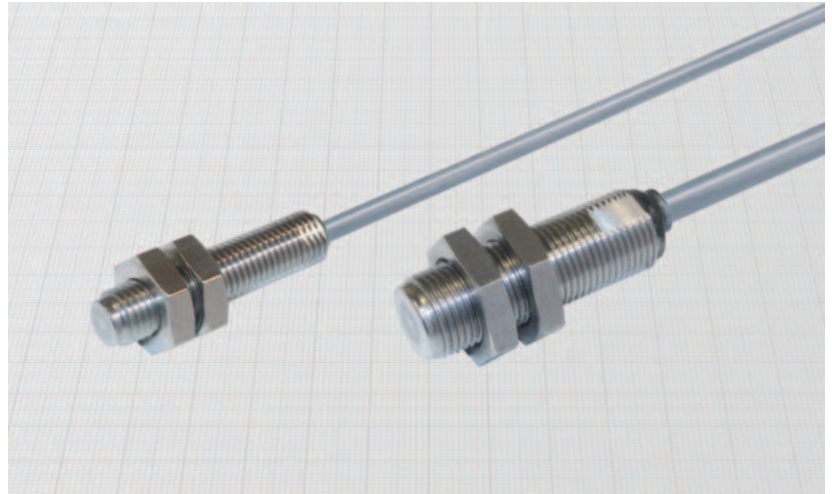
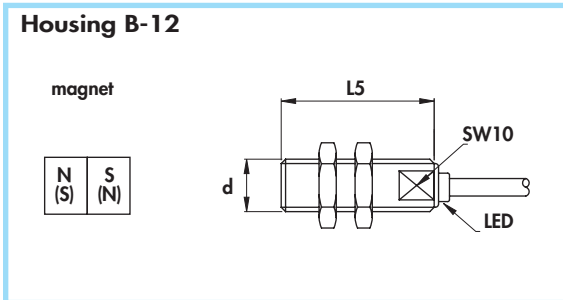
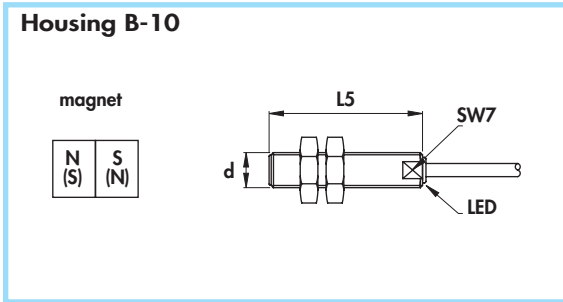
These sensors give on the output a contact activated by an external magnetic field, not depending by the polarity of the field. The activation distance depends by the power of the magnet (see on page C-12), which must be ordered separately. Reed contacts allows to drive directly dc loads (PNP/NPN) or ac loads. The output status is indicated by LED. The extremely strong construction allows the use in the most difficult conditions even with high pressures on the housing.

Technical data:

- Working voltage: 10 ÷ 30 Vac/Vdc
- Voltage drop (U_d) (2 wires versions)
 - with I_e = 10 mA: ≤ 2,2 V
 - with I_e = 100 mA: ≤ 3 V
- Output logic: normally open
- Contact resistance max (3 wires versions): 0,1 Ω
- Operate time max: 1 ms
- Release time max: 0,4 ms
- Temperature range: - 25 ÷ + 85°C
- Degree of protection:
 - front side: IP68
 - cable output side: IP67
- Max pressure on the front side: 150 bar
- Output status indication: yellow LED
- Cable conductor cross section:
 - 0,22 mm² on 8 mm
 - 0,34 mm² on 12 mm

Housing	L1	L2	L3	L4	L5	Cable diameter	Body diameter (d)	Max switching frequency (f)	Rated operational current (I _e)	ORDERING REFERENCES		
										PNP	NPN	2 wires
										NO brown black blue	NO blue black brown	NO black black
B-10	-	-	-	-	35	3,5	M8 x 1	0,5	500	BMS8/4600S		
B-12	-	-	-	-	35	4	M12 x 1	0,5	500	BMS12/4600S		
B-10	-	-	-	-	35	4	M8 x 1	0,5	100	-	-	BMS8/4602S
B-12	-	-	-	-	35	4	M12 x 1	0,5	100	-	-	BMS12/4602S

Amplified in d.c. 3 wires with LED •
 Detection of magnets •
 Cable output •



Diameter	M8 x 1	M12 x 1
Nut	Size	SW13
	Thickness mm	4
Max tightening torque Nm	10	20

Materials:

- Cable: 2m PVC CEI 20 - 22 II; 90°C; 300 V; O.R.
- Housing: stainless steel

General Features:

These sensors are completely electronic and are activated by an external magnetic field, not depending by the polarity of the field. The activation distance depends by the power of the magnet (see on page C-12), which must be ordered separately. Main advantages of static output sensors are unlimited electric life, protection against short circuit and lines transients, high switching frequency and no bounces on switching edges.

The output status is indicated by LED.

The extremely strong construction allows the use in the most difficult conditions even with high pressures on the housing.

Technical data:

- Supply voltage (U_B): 10 ÷ 30 Vdc
- Max ripple: 10%
- No-load supply current (I_0): < 20 mA
- Voltage drop (U_d): ≤ 1.5 V
- Repeat accuracy (R): < 2%
- Temperature range: -25 ÷ + 85°C
- Degree of protection: IP67
- Max pressure on front side: 150 bar
- Output status indicator: yellow LED
- Cable conductor cross section: 0,22 mm² on 8 mm
0,34 mm² on 12 mm

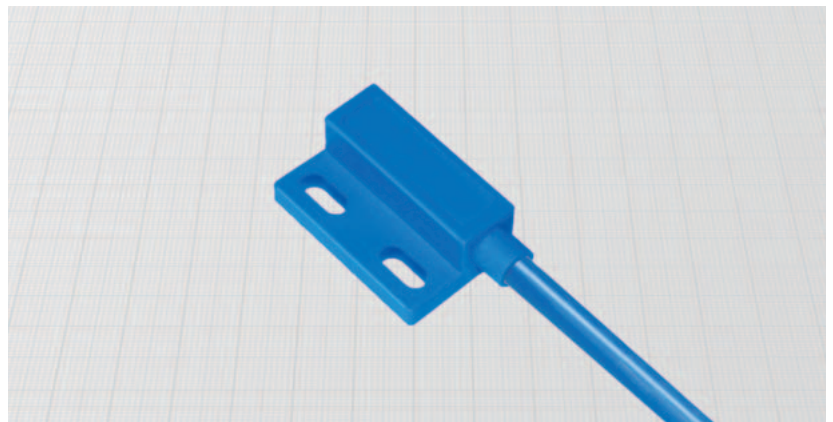
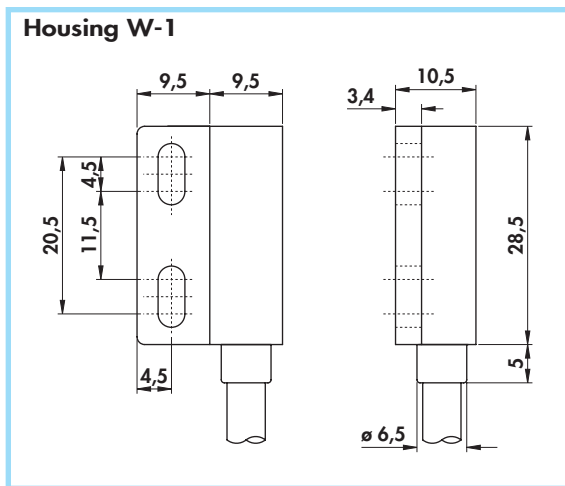
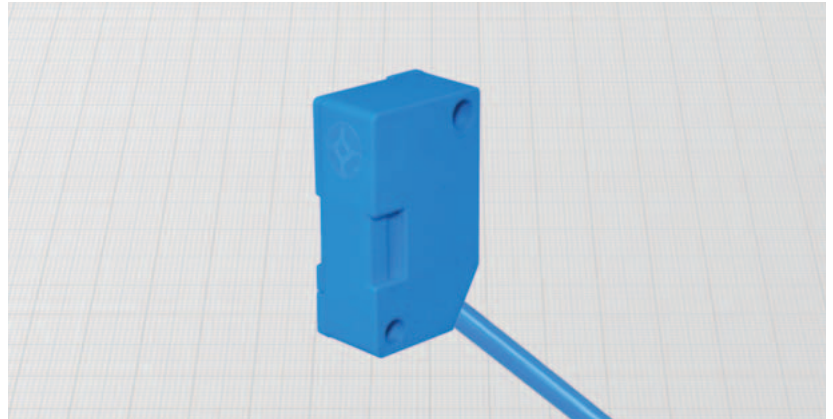
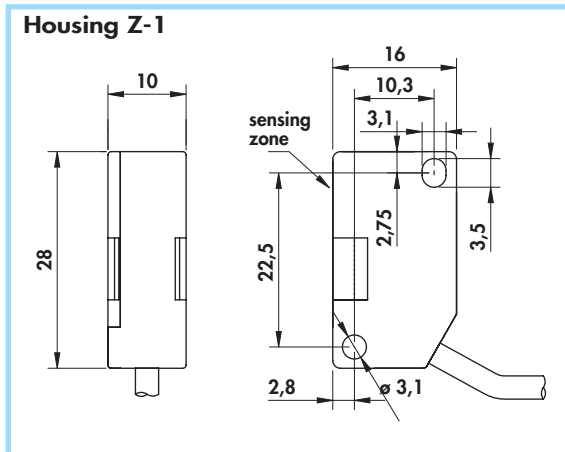
- Protected against short-circuit and overload
- Protected against any wrong connection
- Suppression of initial false impulse
- Electromagnetic compatibility (EMC) according to EN60947-5-2
- Shock and vibration resistance according to EN60068-2-27 EN60068-2-6



Housing	L1	L2	L3	L4	L5	Cable diameter	Body diameter (d)	Max switching frequency (f)	Rated operational current (I _e)	ORDERING REFERENCES	
										PNP (positive switching)	
										NO	NC
B-10	-	-	-	-	35	3,5	M8 x 1	10	200		
B-12	-	-	-	-	35	4	M12 x 1	10	200	BMS8/4609KS	BMS8/4619KS
										BMS12/4609KS	BMS12/4619KS
NPN (negative switching)											
Use the above mentioned part number changing the last number 9 with 8 (ie. BMS8/4608KS)											

RECTANGULAR MAGNETIC SENSORS

- REED CONTACT 2 wires
- Type Z and W
- Cable output



Materials:

- Cable: 2m PVC CEI 20 - 22 II; 90°C; 300 V; O.R.
- Housing: plastic

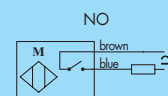
General Features:

These sensors give on the output a contact activated by an external magnetic field, not depending by the polarity of the field. The activation distance depends by the power of the magnet (see on page C-12), which must be ordered separately. Reed contacts allows to drive directly dc loads (PNP/NPN) or ac loads.

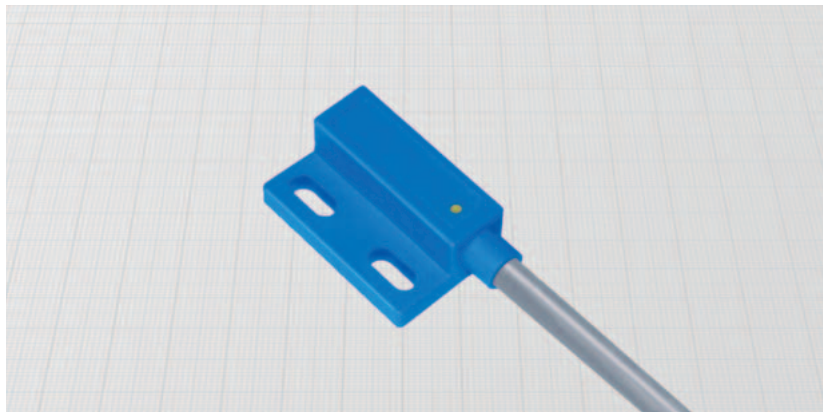
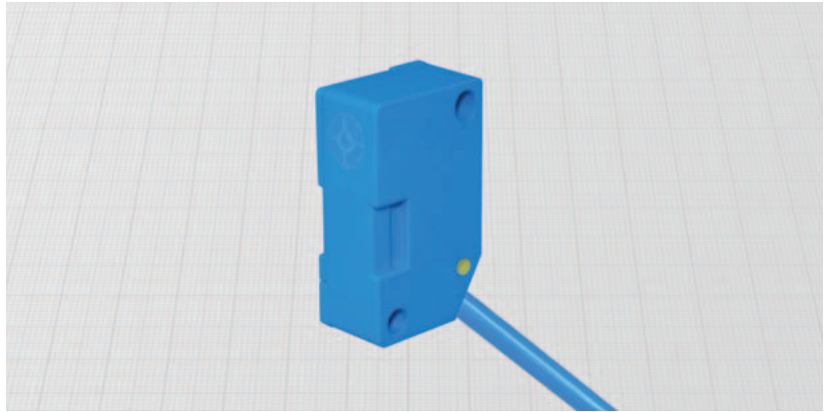
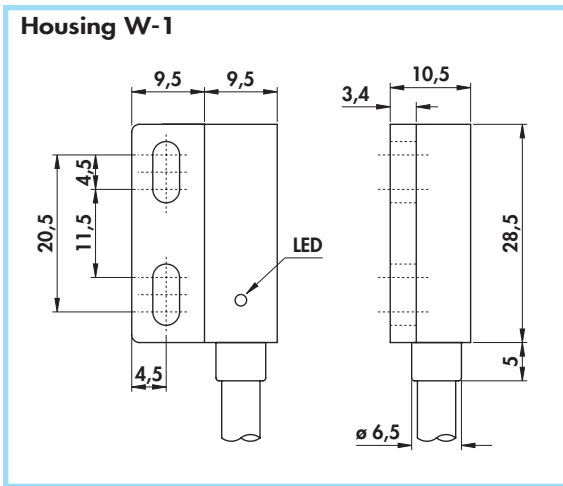
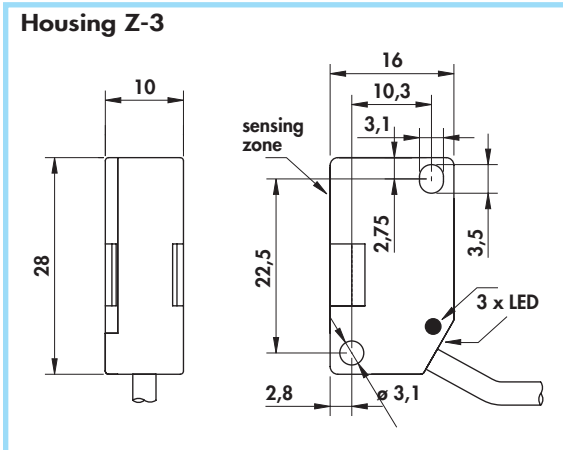
Technical data:

- Working voltage max 50 Vac/75 Vdc
- Output function normally open
- Contact resistance max 0,1 Ω
- Operate time max 1 ms
- Release time max 0,4 ms
- Temperature range -25 \pm + 85°C
- Degree of protection IP67
- Cable conductor cross section 0,15 mm² Type Z
0,50 mm² Type W

Housing	Cable diameter	Max switching frequency (f)	Rated operational current (I _o)	ORDERING REFERENCES
Z - 1	3	0,5	500	BMSZ/4600
W - 1	5	0,5	500	BMSW/4600



Type Z and W - Amplified in d.c. 3 wires with LED •
 Detection of magnets •
 Cable output •



Materials:

- Cable: 2m PVC CEI 20 - 22 II; 90°C; 300 V; O.R.
- Housing: plastic

General Features:

These sensors are completely electronic and are activated by an external magnetic field, not depending by the polarity of the field. The activation distance depends by the power of the magnet (see on page C-12), which must be ordered separately. Main advantages of static output sensors are unlimited electric life, protection against short circuit and lines transient, high switching frequency and no bounces on switching edges. The output status is indicated by LED.

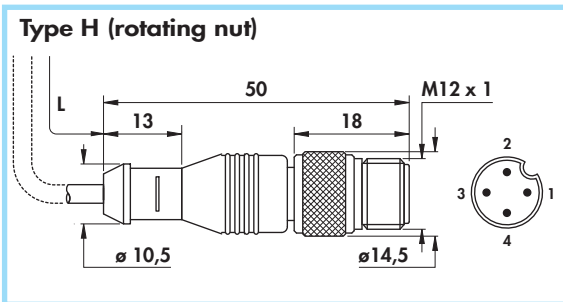
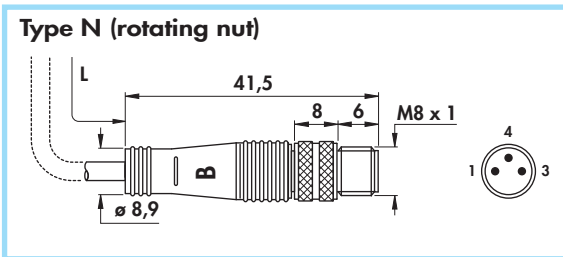
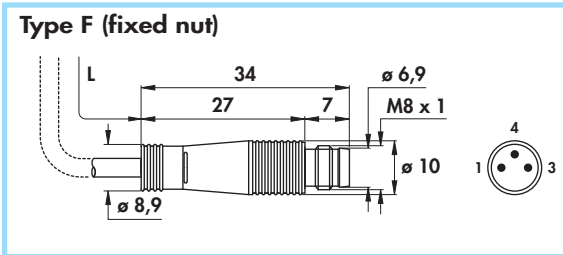
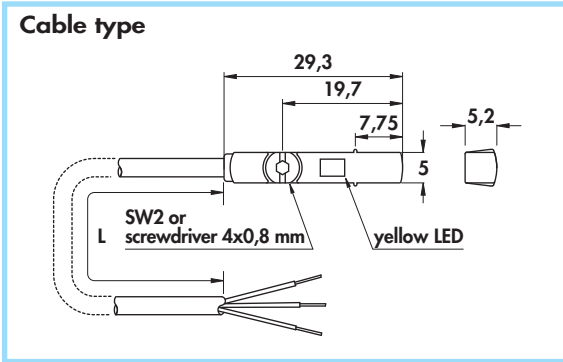
Technical data:

- Supply voltage (U_B): 10 ÷ 30 Vdc
- No-load supply current (I_0): < 20 mA
- Voltage drop (U_d): ≤ 1,5 V
- Repeat accuracy (R): < 2%
- Temperature range: - 25 ÷ + 85°C
- Degree of protection: IP67
- Switch status indicator: yellow LED
- Cable conductor cross section: 0,15 mm² Type Z
0,50 mm² Type W
- Protected against short-circuit, overload and any wrong connection
- Electromagnetic compatibility (EMC) according to EN60947-5-2
- Shock and vibration resistance according to EN60068-2-27 EN60068-2-6

Housing	Max ripple	Cable diameter	Max switching frequency (f)	Rated operational current (I _e)	ORDERING REFERENCES	
					PNP (positive switching)	
	%	mm	KHz	mA		
Z - 3	10	3	10	200	BMSZ/4609KS	BMSZ/4619KS
W - 1	10	5	10	200	BMSW/4609KS	BMSW/4619KS
					NPN (negative switching)	
					Use the above mentioned part number changing the last number 9 with 8 (ie. BMSZ/4608KS)	

RECTANGULAR MAGNETIC SENSORS

- REED CONTACT 2 and 3-wire with LED
- For pneumatic cylinders with T slot
- Drop-in mounting
- Cable and connector output M8 x 1 or M12 x 1



General Features:

This sensor detects the position of the magnetic ring inside a standard pneumatic cylinder with a T slot. The sensor remains completely recessed and thus mechanically protected. A clip to fix the cable inside the slot is supplied with the sensor. Reed contact provides for a direct driving of DC (PNP/NPN) and AC loads. A yellow LED gives indication of the output status.

Available with cable exit, M8x1 connector or M12x1 connector.

Technical data:

- Working voltage: 10 ÷ 30 Vac/Vdc
- Output function: normally open
- Voltage drop (U_d) 2-wire versions:
 - with $I_e = 10 \text{ mA}$ $\leq 2,2 \text{ V}$
 - with $I_e = 160 \text{ mA}$ $\leq 3 \text{ V}$
- Contact resistance max (3-wire versions): 0,1 Ω
- Operate time max: 0,7 ms
- Release time max: 0,4 ms
- Temperature range: -25 ÷ + 85°C
- Degree of protection: IP67
- Output status indication: yellow LED
- Cable conductor cross section: 0,15 mm²
- Electromagnetic compatibility (EMC) according to EN60947-5-2

Materials:

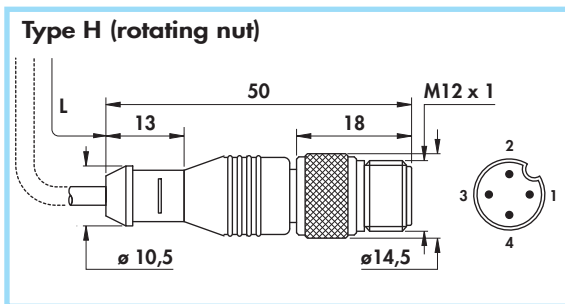
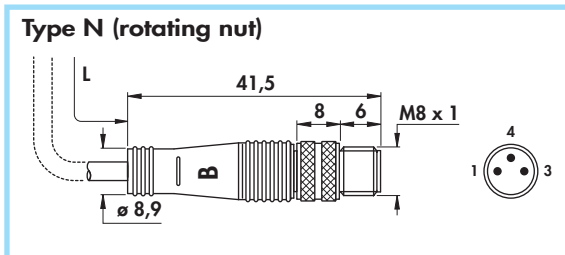
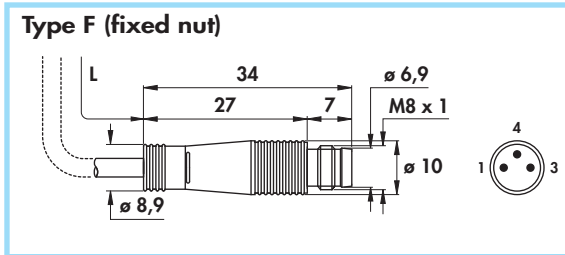
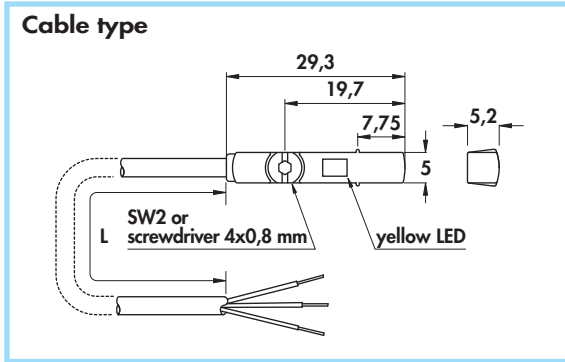
- Cable: BMT... PVC CEI 20-22 II; 90°C; 300V
- BMT...F; BMT...N; BMT...H; BMT...R PUR VDE 0492/265 90°C
- Sensor and fixing clip: plastic
- Rotating nut and fixing screw (*): nickel plated brass

(*) Stainless steel fixing screw available on request

Connection type	Female connector (see page H-1)	Cable diameter	Cable length (L)	Rated operational current (I_e)	Max switching frequency (f)	ORDERING REFERENCES		
						PNP (positive switching)	NPN (negative switching)	2-wire (*)
	n°	mm	m	mA	KHz			
cable	-	3	2	500	0,5			
F	11 - 12	3	0,3	500	0,5	BMT203		-
N	11 - 12	3	0,3	500	0,5	BMT203F		-
H	8B - 10	3	0,3	500	0,5	BMT203N		-
H	8B - 10	3	0,3	500	0,5	BMT203H		-
cable	-	3	2	100	0,5	-		BMT202
F	11 - 12	3	0,3	100	0,5	-		BMT202F (**)
N	11 - 12	3	0,3	100	0,5	-		BMT202N
H	8B - 10	3	0,3	100	0,5	-		BMT202H

Note: - different cable lengths must be specified at the end of the code. Ex: BMT203F1 for 1m of cable with connector.
 - for PUR cable add letter R at the end the code. Ex: BMT203R for 2m of PUR cable.
 - (**) for 2-wire version connected on pins 1-3 (brown-blue) use the code: BMT202C.

Amplified in d.c. 3-wire with LED •
For pneumatic cylinders with T slot •
 Drop-in mounting •
 Cable and connector output M8 x 1 or M12 x 1 •



General Features:

These sensors are completely electronic and detect the position of the magnetic ring inside a standard pneumatic cylinder with a T slot. The sensor remains completely recessed and thus mechanically protected. A clip to fix the cable inside the slot is supplied with the sensor. Main advantages of static output sensors are unlimited electric life, protection against short circuit and line transients, high switching frequency and no contact bounce. Version with output holding function available on request. A yellow LED gives indication of the output status. Available with cable exit, M8x1 connector or M12x1 connector.

Technical data:

- Supply voltage (U_B): 10 ÷ 30 Vdc
- No-load supply current (I_0): < 10 mA
- Temperature range: -25 ÷ + 85° C
- Degree of protection: IP67
- Switch status indicator: yellow LED
- Cable conductor cross section: 0,15 mm²
- Electromagnetic compatibility (EMC) according to EN60947-5-2
- Protected against short circuit, overload and connection mistakes
- Shock and vibration resistance according to EN60068-2-27 EN60068-2-6

Materials:

- Cable: BMT... PVC CEI 20-22 II; 90°C; 300V
 BMT...F; BMT...N; BMT...H; BMT...R PUR VDE 0492/265 90°C
- Sensor and fixing clip: plastic
- Rotating nut and fixing screw (*): nickel plated brass

(*) Stainless steel fixing screw available on request

Connection type	Female connector (see page H - 1)	Cable diameter	Cable length (L)	Max ripple	Max switching frequency (f)	Rated operational current (I _e)	ORDERING REFERENCES	
							PNP (positive switching)	
cable	-	3	2	10	10	200		
F	11-12	3	0,3	10	10	200	BMT209	BMT219
N	11-12	3	0,3	10	10	200	BMT209F	BMT219F
H	8B-10	3	0,3	10	10	200	BMT209N	BMT219N
							BMT209H	BMT219H

Note:
 - different cable lengths must be specified at the end of the code.
 Ex: BMT209F1 for 1m of cable with connector.
 - for PUR cable add letter R at the end of the code.
 Ex: BMT209R for 2m of PUR cable.

NPN (negative switching)
 Use the above mentioned part number changing the last number 9 with 8 (ie. BMT208)

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• MAGNETS FOR SENSORS

Fig. A

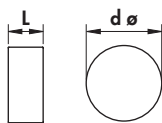


Fig. B

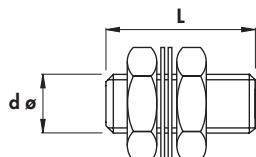


Fig. C

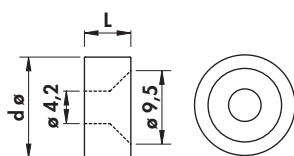
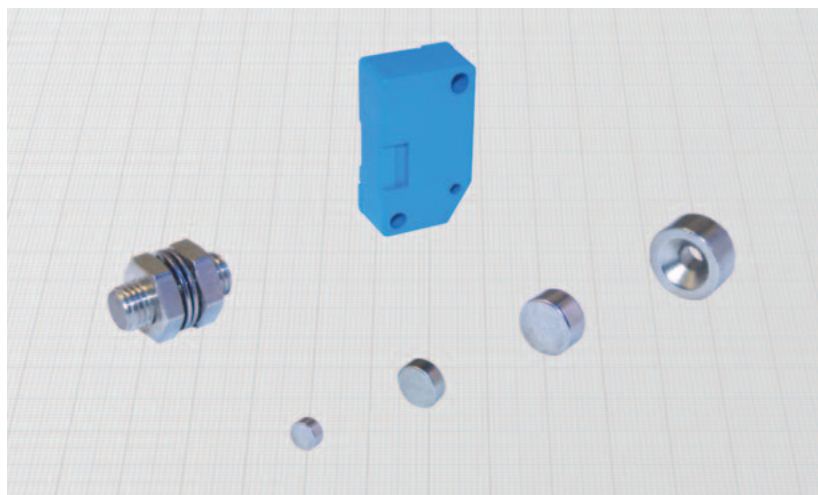
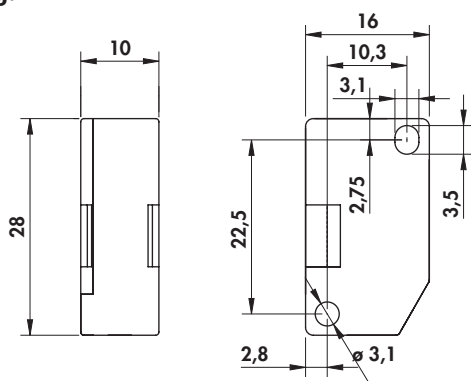


Fig. D



General Features:

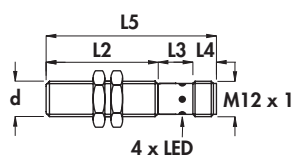
These magnets can be used as actuator for all the magnetic sensors which need an external activation magnet. They're suitable for applications up to 70° C. For particular applications contact our technical office.

In the ordering reference table there are approximate detection distances obtained with different types of BDC sensors.

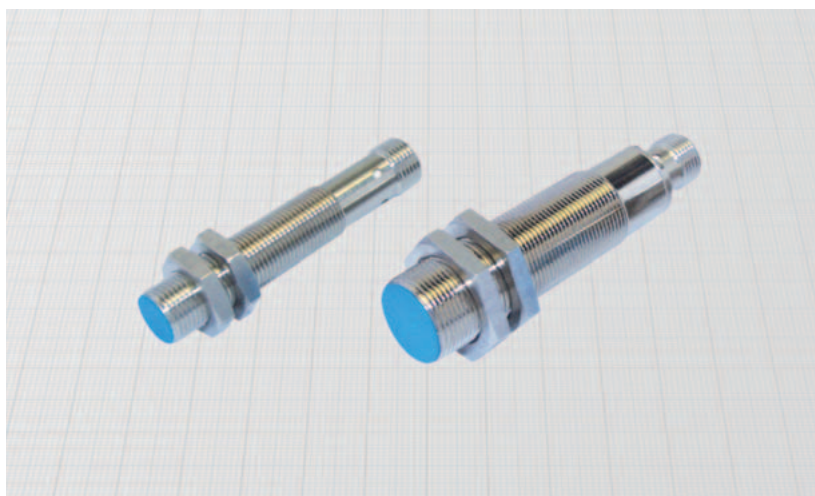
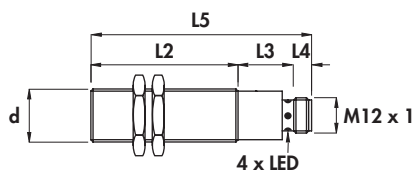
Fig.	Diameter	L	DETECTION DISTANCE		ORDERING REFERENCES
			With Reed sensors	With static sensors	
	mm	mm			
A	5	3	6	15	MAG-T53 MAG-T83 MAG-T105
A	8	3,6	13	22	
A	10	5	20	30	
B	M8x1	20	10	17	MAG-M820
C	13	6	25	45	MAG-TF136
D	-	-	13	22	MAG-Z

- Amplified in d.c. 3 and 4 wires
- Detection of ferromagnetic targets
- Connector output M12 x 1

Housing I-14



Housing I-13



Diameter	M12 x 1	M18 x 1
Nut	Size	SW17
	Thickness mm	4
Max tightening torque Nm	15	35

Materials:

- Housing: nickel plated brass
- Sensing face: plastic

General Features:

These sensors are able to detect only ferromagnetic objects. They are mainly used as selective sensors on working plants for aluminium, brass, copper, where bits of metal would create unavoids signals using standard inductive sensors.

Technical data:

- Supply voltage (U_B): 10 ÷ 30 Vdc
- Max ripple: 10%
- No-load supply current (I_0): ≤ 20 mA
- Voltage drop (U_d): ≤ 1,5 V
- Temperature range: -20° ÷ +70°C
- Max thermal drift of sensing distance S_r : ± 10%
- Repeat accuracy (R): 2%
- Switching hysteresis max (H): 10%
- Degree of protection: IP67
- Switch status indicator: yellow LED
- Protected against short-circuit and overload
- Protected against any wrong connection
- Suppression of initial false impulse
- Electromagnetic compatibility (EMC) according to EN60947-5-2
- Shock and vibration resistance according to EN60068-2-27 EN60068-2-6

Housing	Flush mounting Non flush mounting	L1	L2	L3	L4	L5	Female connector	Body diameter (d)	Max switching frequency (f)	Rated operational current (I_e)	Nominal sensing distance (S_n) ± 10% with Fe37	ORDERING REFERENCES		
												PNP (positive switching)		
I-14	•	-	43	15	8	66	6-8B-10	M12 x 1	1	200	3			
I-13	•	-	50	19	8	77	6-8B-10	M18 x 1	1	200	3	DCH12/4309KS	DCH12/43C9KS	DCH12/4329KS

NPN (negative switching)
Use the above mentioned part number changing the last number 9 with 8 (ie. DCH12/4308KS)