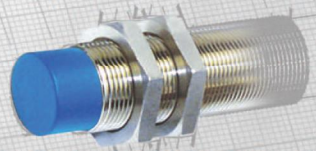


MAGNETIC SENSORS

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 tecnologies : Reed contact or solid state.

Reed contact

This is the most cost effective solution. Being assembled with the same production process as for the inductive sensors, they join the advantages of a robust and sealed construction to the performance of a electromechanical device:
- no need of power suppy
- no voltage drop
- no minimum load requirement
- no limitations for series or parallel connection

It must be observed that eventhough the number of cycles of a Reed contact is very high, it is not infinite. They are hence not suitable for applications with high working frequencies or requiring fast response times. It is also highly recommended to avoid the application of eccessive mechanical stresses on the body of the sensor.

Working principle:

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

Amplified in d.c. or solid state output

They are much more sensitive than the Reed contacts, as shown in table at page C-12.
They have all the advantages of the solid state sensors :
- Unlimited number of cycles
- Very fast switching time
- High working frequencies
- High resistance against vibration and mechanical strenght of the housing

Working principle:

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

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 pieces of metal would create unwanted 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 stages.

MAGNETIC SENSORS

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

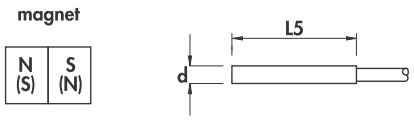
L = smooth body
J = degree of protection IP68
K = protection against short circuit and overload
S = LED output status
T = high temperatures version
P = high current REED contact

Cable length (if required different than standard 2m)

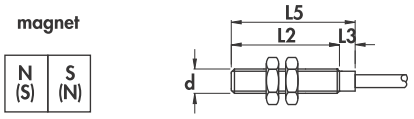
For Polyurethane cable add PUR

REED CONTACT 2-wire •
Detection of external magnets •
Cable output •

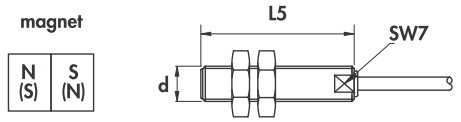
Housing A



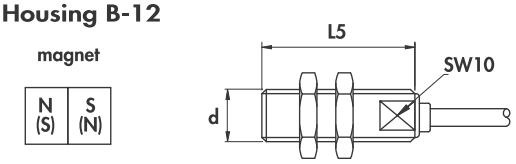
Housing B-6



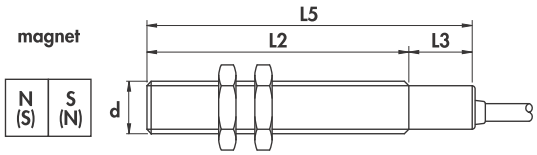
Housing B-10



Housing B-12



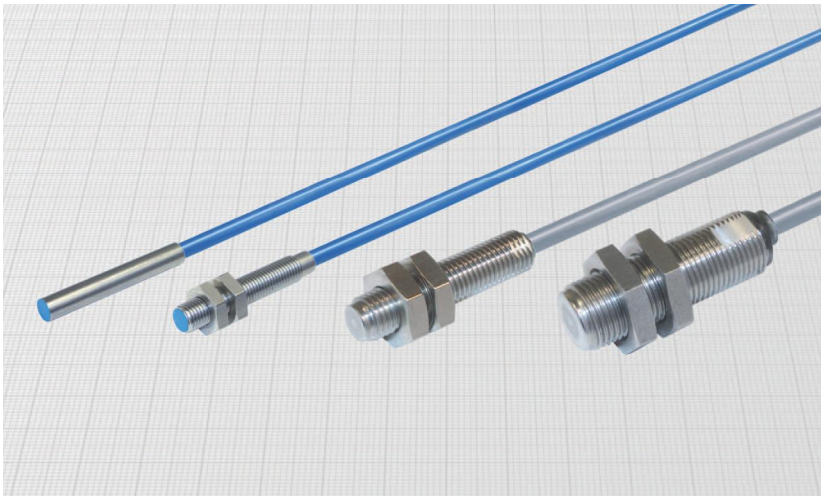
Housing B-20



Diameter		M5 x 0,5	M8 x 1	M12 x 1
Nut	Size	SW7	SW13	SW17
	Thickness mm	2,5	4	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 produce an output contact activated by an external magnetic field, independent by the polarity of the field. The activation distance depends upon the power of the magnet (see on page C-12), which must be ordered separately.
Reed contacts are able 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.

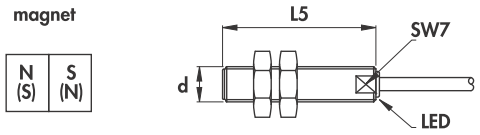
Technical data:

- Max working voltage: 250 Vac/Vdc
- Output logic normally open
- Contact resistance max 0,1 Ω
- Operate time max 9 ms
- Release time max 5 ms
- Temperature range - 25 ÷ + 85°C
- Degree of protection: front side (diameters 8 and 12 mm): IP68/IP69K
  back side: IP67
- Pressure on the front side max (diameters 8 and 12 mm): 150 bar

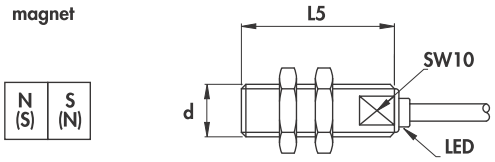
Housing	L1	L2	L3	L4	L5	Cable diameter	Body diameter (d)	Max switching frequency (f)	Rated operational current (I_e)	Cable conductor cross section	ORDERING REFERENCES
	mm	mm	mm	mm	mm	mm	mm	KHz	A	mm^2	NO black / black
A	-	-	-	-	25	3	4	0,5	0,5	0,15	**BMS4/4600L**
B - 6	-	20	5	-	25	3	M5 x 0,5	0,5	0,5	0,15	**BMS5/4600**
A	-	-	-	-	30	4	6,5	0,5	0,5	0,35	**BMS6,5/4600L**
B - 10	-	-	-	-	35	4	M8 x 1	0,5	0,5	0,35	**BMS8/4600**
B - 12	-	-	-	-	35	4	M12 x 1	0,5	0,5	0,35	**BMS12/4600**
B - 20	-	60	15	-	75	5	M12 x 1	0,7	3	0,5	**BMS12P/4600P**

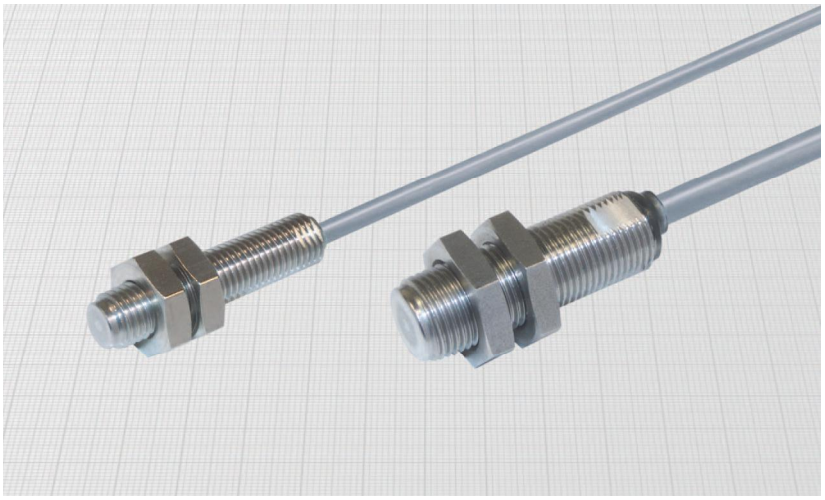
• REED CONTACT 2 and 3-wire with LED
• Detection of external magnets
• Cable output

Housing B-10



Housing B-12





Diameter		M8 x 1	M12 x 1
Nut	Size	SW13	SW17
	Thickness mm	4	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 produce an output contact activated by an external magnetic field, independent by the polarity of the field. The activation distance depends upon the power of the magnet (see on page C-12), which must be ordered separately.
Reed contacts are able 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-wire versions) with I_e = 10 mA: ≤ 2,2 V
  with I_e = 100 mA: ≤ 3 V
- Output logic: normally open
- Contact resitance max (3-wire 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-wire
	mm	mm	mm	mm	mm	mm	mm	KHz	mA	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**

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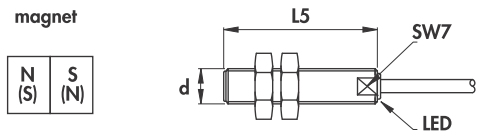
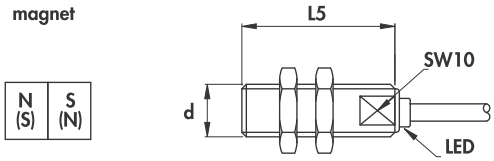
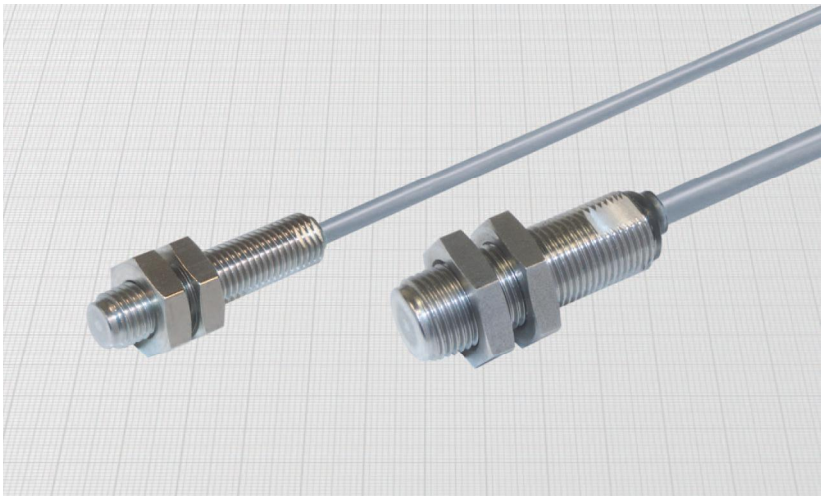
Amplified in d.c. 3-wire with LED •
Detection of external magnets •
Cable output •

Housing B-10



Housing B-12





Diameter		M8 x 1	M12 x 1
Nut	Size	SW13	SW17
	Thickness mm	4	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:

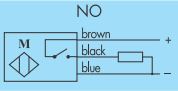
These sensors are completely electronic and are activated by an external magnetic field, independent of the polarity of the field. The activation distance depends upon the power of the magnet (see on page C-12), which must be ordered separately.
Main advantages of static output sensors are unlimited electric life, protection against short circuit and line transients, high switching frequency and no contact bounce.
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.

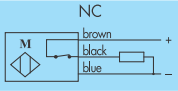
Technical data:

- Supply voltage (U_B): 10 ÷ 30 Vdc
- Max ripple: 10%
- No-load supply current (I_o): < 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 CE
- Shock and vibration resistance according to EN60068-2-27 EN60068-2-6

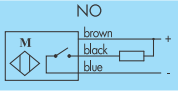
Housing	L1	L2	L3	L4	L5	Cable diameter	Body diameter (d)	Max switching frequency (f)	Rated operational current (I_e)	ORDERING REFERENCES PNP (positive switching) NO	NC
	mm	mm	mm	mm	mm	mm	mm	KHz	mA		
B-10	-	-	-	-	35	3,5	M8 x 1	10	200	**BMS8/4609KS**	**BMS8/4619KS**
B-12	-	-	-	-	35	4	M12 x 1	10	200	**BMS12/4609KS**	**BMS12/4619KS**



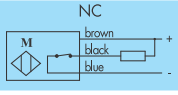


NPN (negative switching)
Use the above mentioned part number changing the last number 9 with 8 (ie. BMS8/4608KS)

NO

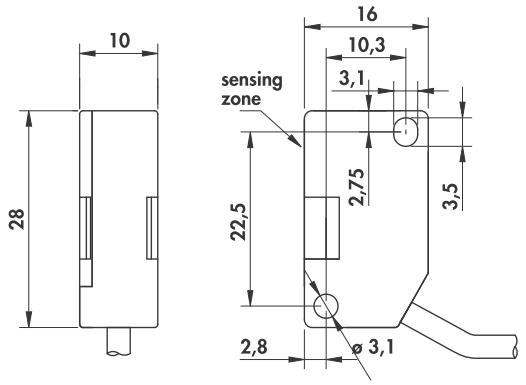


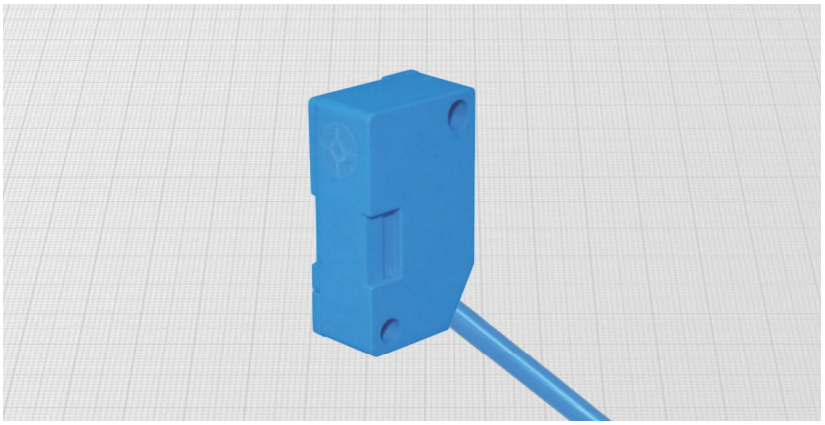
NC



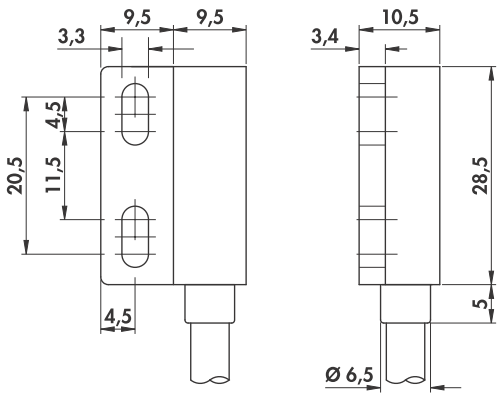
- **REED CONTACT 2-wire**
- **Type Z and W**
- Cable output

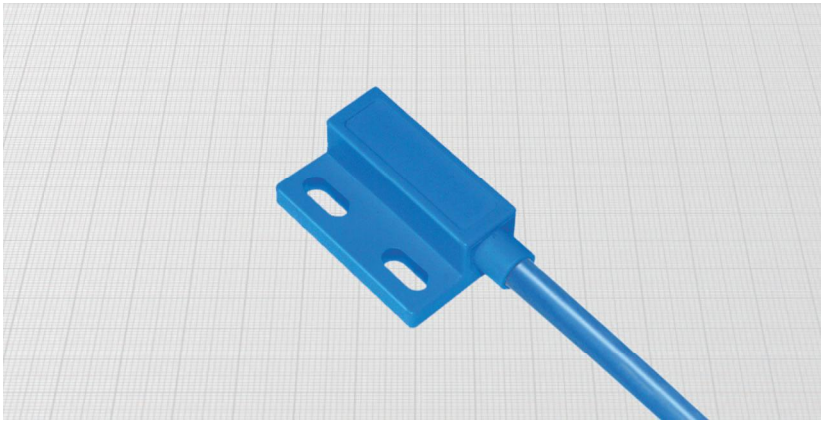
Housing Z-1





Housing W-1





Materials:

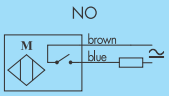
- Cable: 2m PVC CEI 20 - 22 II; 90°C; 300 V; O.R.
- Housing: plastic

General Features:

These sensors produce an output contact activated by an external magnetic field, independent by the polarity of the field. The activation distance depends upon the power of the magnet (see on page C-12), which must be ordered separately.
Reed contacts are able 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 ÷ + 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_e)	ORDERING REFERENCES
	mm	KHz	mA	NO 
Z - 1	3	0,5	500	**BMSZ/4600**
W - 1	5	0,5	500	**BMSW/4600**

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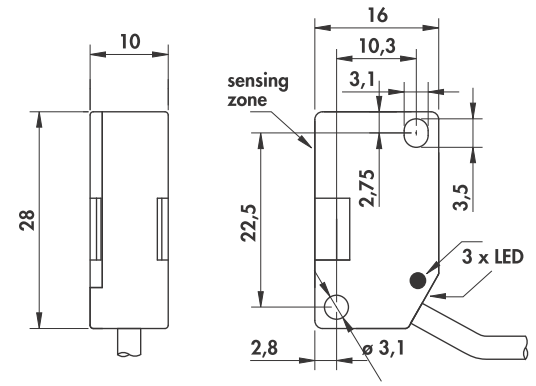
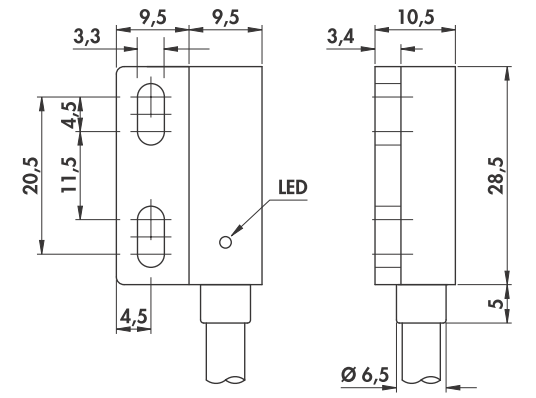
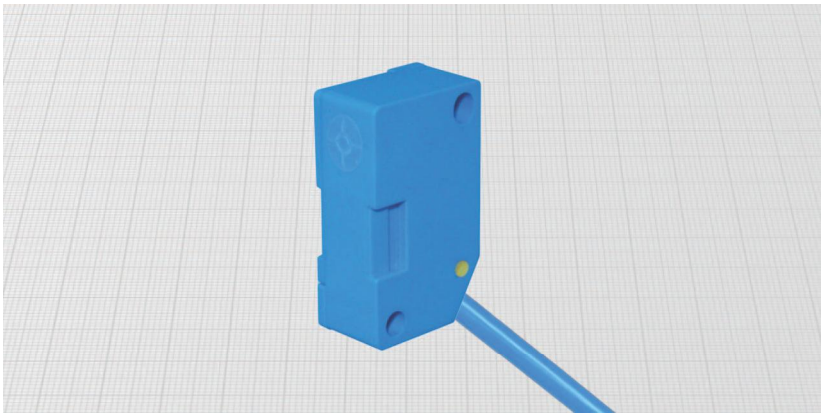
Type Z and W - Amplified in d.c. 3-wire with LED • Detection of external magnets • Cable output •

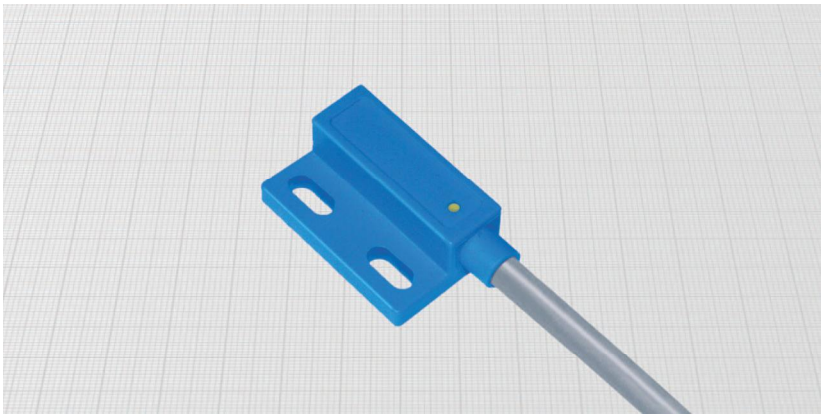
Housing Z-3



Housing W-1







Materials:

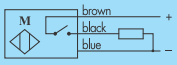
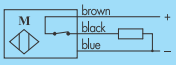
- Cable: 2m PVC CEI 20 - 22 II; 90°C; 300 V; O.R.
- Housing: plastic

General Features:

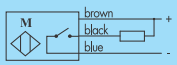
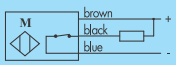
These sensors are completely electronic and are activated by an external magnetic field, independent of the polarity of the field. The activation distance depends upon the power of the magnet (see on page C-12), which must be ordered separately.
Main advantages of static output sensors are unlimited electric life, protection against short circuit and line transient, high switching frequency and no contact bounce.
The output status is indicated by LED.

Technical data:

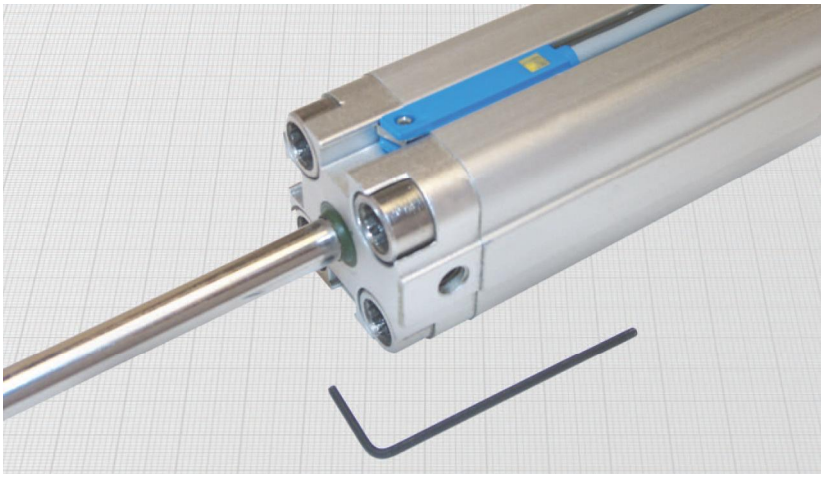
- Supply voltage (U_B): 10 ÷ 30 Vdc
- No-load supply current (I_o): < 20 mA
- Voltage drop (U_d) ≤ 1,5 V
- Repeat accuracy (R): < 2%
- Temperature range: - 25 ÷ + 85°C
- Degree of protection: IP67
- Switch status indicator: yellow LED
- Cable conductor cross section 0,15 mm² Type Z
  0,50 mm² Type W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

NO 
NC 

- **REED CONTACT 2 and 3-wire with LED**
- **For pneumatic cylinders**
- Cable and connector output M8 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. 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 or connector M8x1.

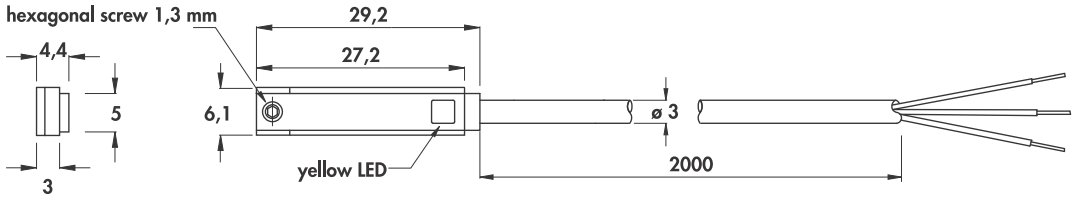
Technical data:

• Working voltage:	10 ÷ 30 Vac/Vdc
• Output function:	normally open
• Voltage drop (U_d) 2-wire versions:	with I_e = 10 mA ≤ 2,2 V with I_e = 160 mA ≤ 3 V
• Contact resistance max (3-wire versions):	0,1 Ω
• Operate time max:	1 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

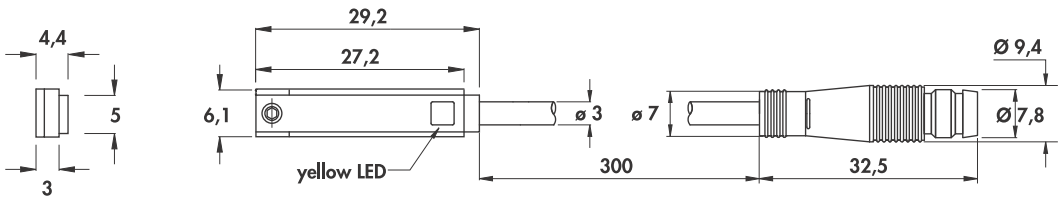
Materials:

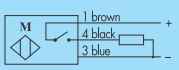
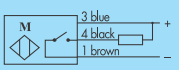
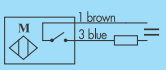
• Cable:	PVC CEI 20-22 II; 90°C; 300V
• Connector:	PUR
• Sensor:	plastic
• Connector ring nut and fixing nut:	nickel plated brass

Housing S-1



Housing S-2



Housing	Female connector	Cable diameter	Rated operational current (I_e)	Max switching frequency (f)	ORDERING REFERENCES		
					PNP (positive switching)	NPN (negative switching)	2-wire
							
	n°	mm	mA	KHz			
S - 1	-	3	500	30,5	**BMS/4600S**		-
S - 2	11- 12	3	500	0,5	**BMS/4F00S**		-
S - 1	-	3	100	0,5	-		**BMS/4602S**
S - 2	11- 12	3	100	0,5	-		**BMS/4F02S**

Note: different cable lengths must be specified at the end of the code. Ex: BMS/4F00S -1 for 1m of cable with connector

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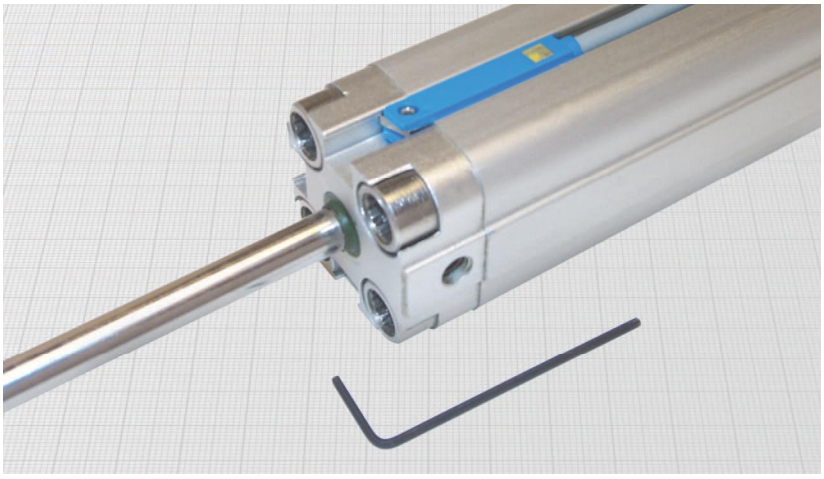
Amplified in d.c. 3-wire with LED •
For pneumatic cylinders •
Cable and connector output M8 x 1 •

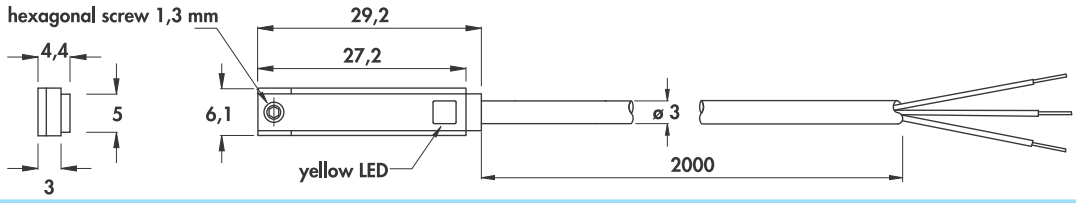


General Features:
These sensors are completely electronic and detect the position of the magnetic ring inside a standard pneumatic cylinder with a T slot. The sensor remains completely recessed and thus mechanically protected. Main advantages of static output sensors are unlimited electric life, protection against short circuit and line transients, high switching frequency and no contact bounce. A yellow LED gives indication of the output status. Available with integral cable or connector M8x1.

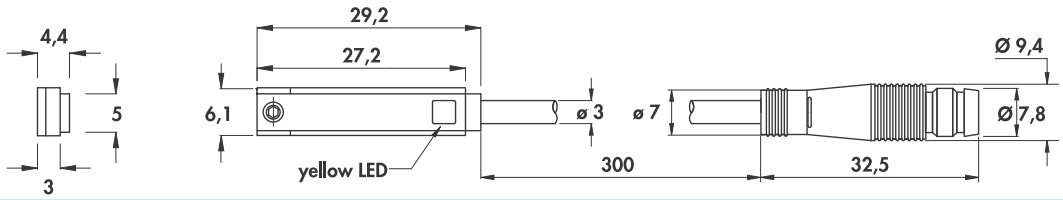
Technical data:
- Supply voltage (U_B): 10 ÷ 30 Vdc
- No-load supply current (I_o): < 10 mA
- Temperature range: - 25 ÷ + 85° C
- Degree of protection: IP67
- Switch status indicator: yellow LED
- Cable conductor cross section: 0,15 mm²
- Electromagnetic compatibility (EMC) according to EN60947-5-2 CE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

Materials:
- Cable: PVC CEI 20-22 II; 90°C; 300V
- Connector body: PUR
- Sensor body: plastic
- Connector ring nut and fixing nut: nickel plated brass

Housing S-1



Housing S-2



Housing	Female connector	Cable diameter	Max ripple	Max switching frequency (f)	Rated operational current (I_e)	ORDERING REFERENCES PNP (positive switching) NO	NC
	n°	mm	%	KHz	mA		
S - 1	-	3	10	10	200	**BMS/4609KS**	**BMS/4619KS**
S - 2	11- 12	3	10	10	200	**BMS/4F09KS**	**BMS/4F19KS**

Note: different cable lengths must be specified at the end of the code.
Ex: BMS/4F00S -1 for 1m of cable with connector.

NPN (negative switching)
Use the above mentioned part number changing the last number 9 with 8 (ie. BMS/4608KS)

• MAGNETS FOR SENSORS

Fig. A

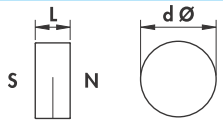


Fig. B - Epoxy encapsulated

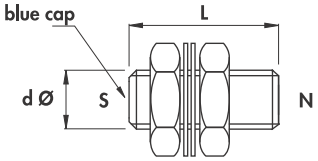


Fig. C - Epoxy coated

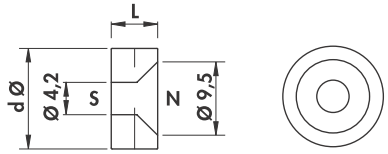


Fig. D - Epoxy encapsulated

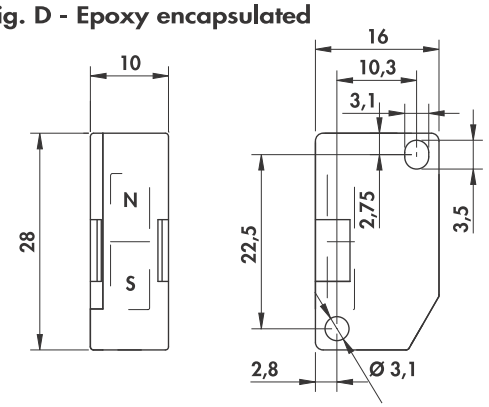
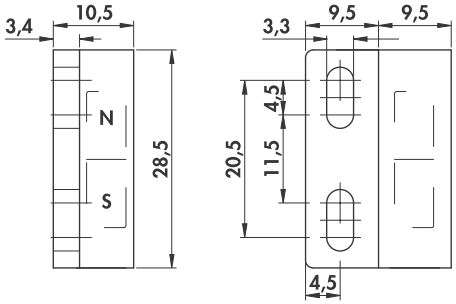
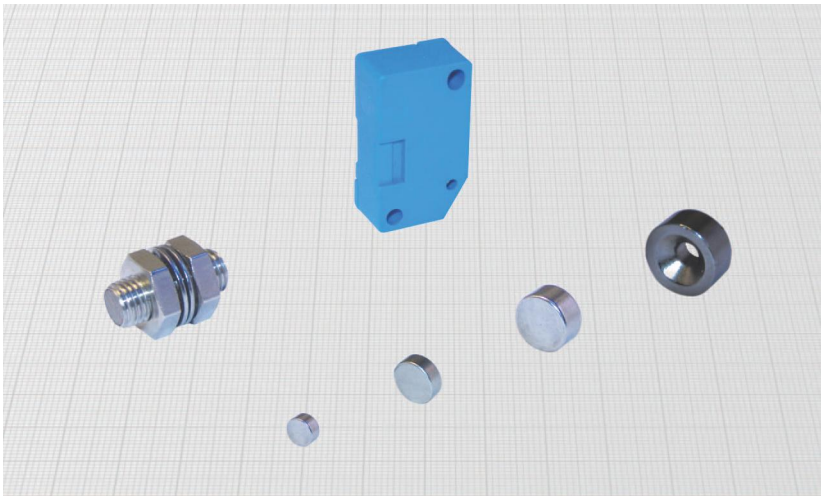


Fig. D - Epoxy encapsulated





General Features:

These magnets can be used as actuators 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.
Models showed on fig. B - D - E are epoxy encapsulated, not subject to oxidation.

Fig.	Diameter	L	DETECTION DISTANCE		ORDERING REFERENCES
	mm	mm	With Reed sensors	With solid state sensors	
A	5	3	6	15	**MAG-T53**
A	5	10	14	25	**MAG-T510**
A	8	3,6	13	22	**MAG-T83**
A	10	5	20	30	**MAG-T105**
B	M8x1	20	10	17	**MAG-M820**
C	13	6	25	45	**MAG-TF136**
D	-	-	13	22	**MAG-Z**
E	-	-	15	27	**MAG-W**

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