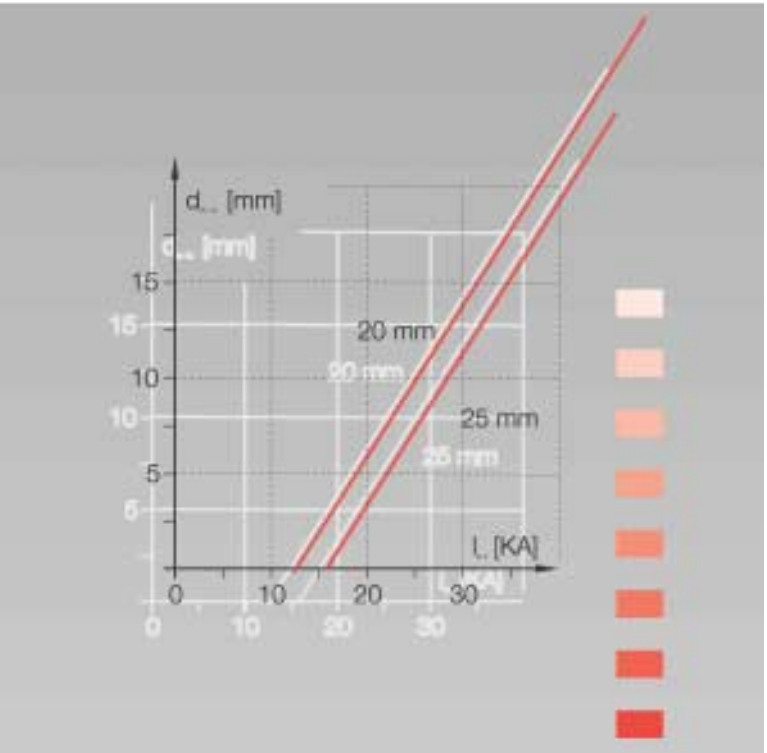
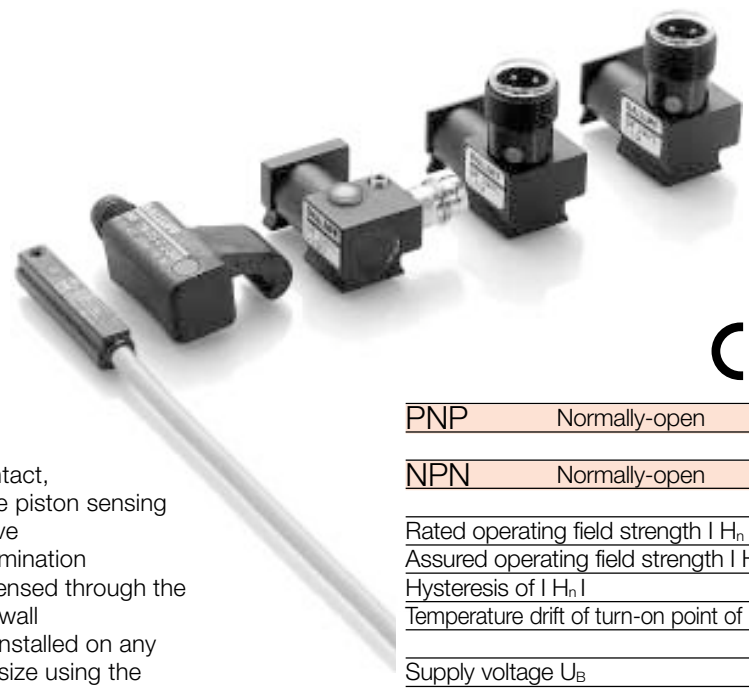
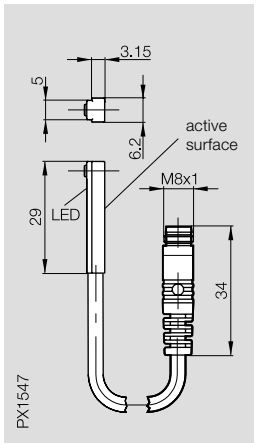
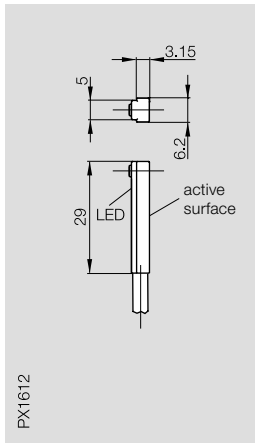


Magnetic field sensors respond to an external magnetic field. Their main area of application is sensing piston positions in pneumatic cylinders.

- Non-contact
- Wear-free
- Non-interfering
- Bounceless output signal
- Function indicator
- Switching independent of the polarization of the magnetic field
- No multiple switchpoints
- Compact housings
- Can be attached to any cylinder type



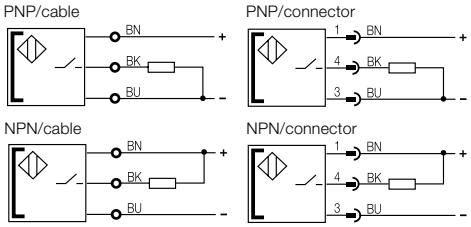




- Non-contact, wear-free piston sensing
- Insensitive to contamination
- Piston sensed through the cylinder wall
- Can be installed on any cylinder size using the corresponding bracket

Series		BMF 307	BMF 307
PNP	Normally-open	BMF 307K-PS-C-2-S49-	BMF 307K-PS-C-2-
NPN	Normally-open		
Rated operating field strength I H_n I		1.2 kA/m	1.2 kA/m
Assured operating field strength I H_a I		≥ 2 kA/m	≥ 2 kA/m
Hysteresis of I H_n I		≤ 45 %	≤ 45 %
Temperature drift of turn-on point of I H_n I		≤ 0.3 %/°C	≤ 0.3 %/°C
Supply voltage U_B		10...30 V DC	10...30 V DC
Voltage drop U_d		≤ 3.1 V	≤ 3.1 V
Rated insulation voltage U_i		75 V DC	75 V DC
Rated operational current I_e		200 mA	200 mA
No-load supply current I_0 max.		≤ 30 mA	≤ 30 mA
Off-state current I_r		≤ 80 µA	≤ 80 µA
Protected against polarity reversal		yes	yes
Short circuit protected		yes	yes
Load capacity		≤ 1 µF	≤ 1 µF
Ambient temperature range T_a		–25...+70 °C	–25...+70 °C
Utilization category		DC 13	DC 13
Degree of protection per IEC 60529		IP 67	IP 67
Housing material		LCP	LCP
Connection		cable with connector	cable
No. of wires × conductor cross section			3 × 0.14 mm²
Approval		cULus	cULus
Recommended connector		BKS-B 48	

Wiring diagrams



Please add the cable length to the ordering code for sensors with **cable!**
PU-03, PU-05 = PUR, length 3 m or 5 m

Please add the cable length to the ordering code for sensors with **cable and connector!**
00,2, 00,5 = PUR, length 0.2 m or 0.5 m

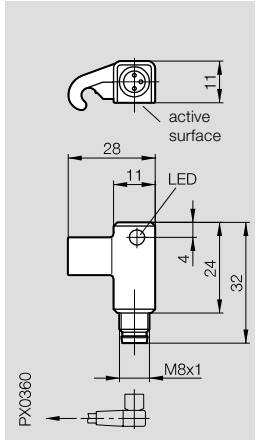
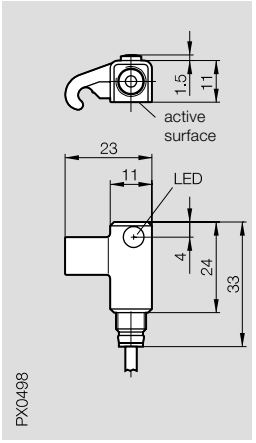
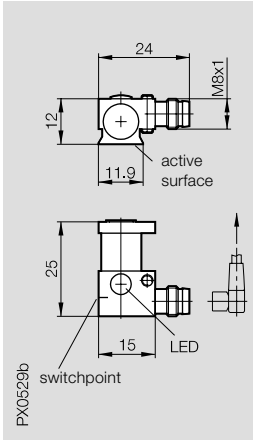
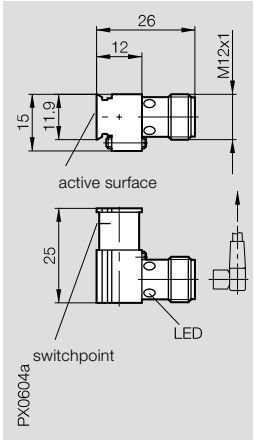
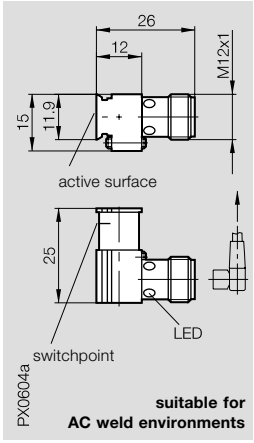
Connector orientation

Brackets for

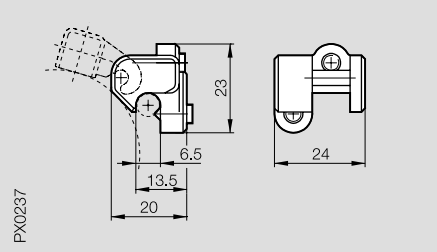
	Cylinder with tie rod
	Cylinder with DUO rail
	Cylinder without tie rod/rail
	Profile cylinder
	Cylinder with trapezoidal rail

Without brackets

	Cylinder with T-slot/ trapezoidal slot	useable without bracket in cylinder with T-slot e. g. Festo ADVU, DRQ, DGP

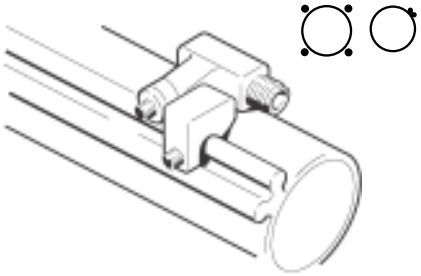
	BMF 21	BMF 21	BMF 32	BMF 32	BMF 32
					
	BMF 21K-PS-C-2-S49	BMF 21K-PS-C-2-	BMF 32M-PS-C-2-S49	BMF 32M-PS-C-2-S 4	BMF 32M-PS-W-2-S 4
	BMF 21K-NS-C-2-S49	BMF 21K-NS-C-2-	BMF 32M-NS-C-2-S49	BMF 32M-NS-C-2-S 4	
	1.2 kA/m	1.2 kA/m	1.2 kA/m	1.2 kA/m	1.2 kA/m
	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m
	≤ 45 %	≤ 45 %	≤ 45 %	≤ 45 %	≤ 45 %
	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C
	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
	≤ 3.1 V	≤ 3.1 V	≤ 3.1 V	≤ 3.1 V	≤ 4 V
	75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
	200 mA	200 mA	200 mA	200 mA	200 mA
	≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA
	≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA
	yes	yes	yes	yes	yes
	yes	yes	yes	yes	yes
	≤ 1 µF	≤ 1 µF	≤ 1 µF	≤ 1 µF	≤ 0.15 µF
	–25...+70 °C	–25...+70 °C	–25...+70 °C	–25...+70 °C	–25...+70 °C
	DC 13	DC 13	DC 13	DC 13	DC 13
	IP 67	IP 67	IP 67	IP 67	IP 67
	PBT (fiberglass reinforced)	PBT (fiberglass reinforced)	Al	Al	Al
	connector	cable	connector	connector	connector
		3 × 0.14 mm²			
	cULus		cULus	cULus	cULus
	BKS-B 48/BKS-B 49		BKS-B 48/BKS-B 49	BKS-B 19/BKS-B 20	BKS-B 19/BKS-B 20
	BMF 21-HW-8 BMF 21-HW-10	BMF 21-HW-8 BMF 21-HW-10	BMF 32-HW-13 BMF 32-HW-15	BMF 32-HW-13 BMF 32-HW-15	BMF 32-HW-13 BMF 32-HW-15
	BMF 21-HW-8	BMF 21-HW-8	BMF 32-HW-16 BMF tube cuff	BMF 32-HW-16 BMF tube cuff	BMF 32-HW-16 BMF tube cuff
	BMF 21-HW-11 BMF tube cuff	BMF 21-HW-11 BMF tube cuff	BMF tube cuff	BMF tube cuff	BMF tube cuff
	BMF 21-HW-10	BMF 21-HW-10	BMF 32-HW-15	BMF 32-HW-15	BMF 32-HW-15
			BMF 32-HW-12 (Mecman) BMF 32-HW-14 (Bosch)	BMF 32-HW-12 (Mecman) BMF 32-HW-14 (Bosch)	BMF 32-HW-12 (Mecman) BMF 32-HW-14 (Bosch)
			useable without bracket on cylinders with 60°- or 90°-trapezoidal slot e. g. Festo, Bosch, Martonair		

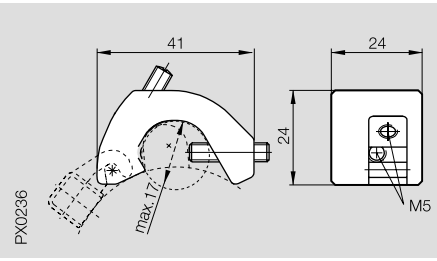
3
Brackets page 3.14 ...
Connectors selection guide page 3.20 ...
6
Connectors ... page 6.2 ...



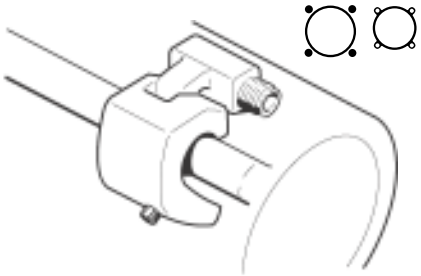
BMF 21-HW-8
for pneumatic cylinder with tie rod
any piston diameter
tie rod diameter up to 6.5 mm

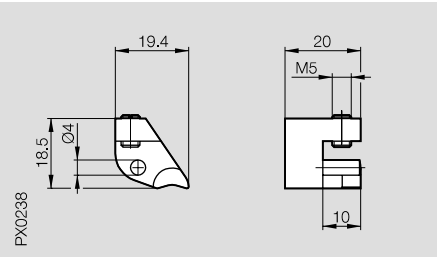
pneumatic cylinder with DUO rail
(Festo), any piston diameter



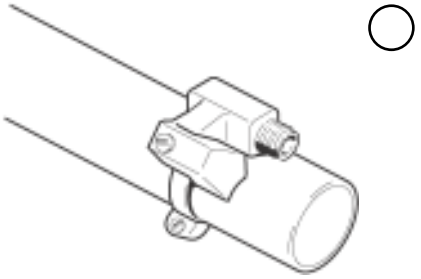


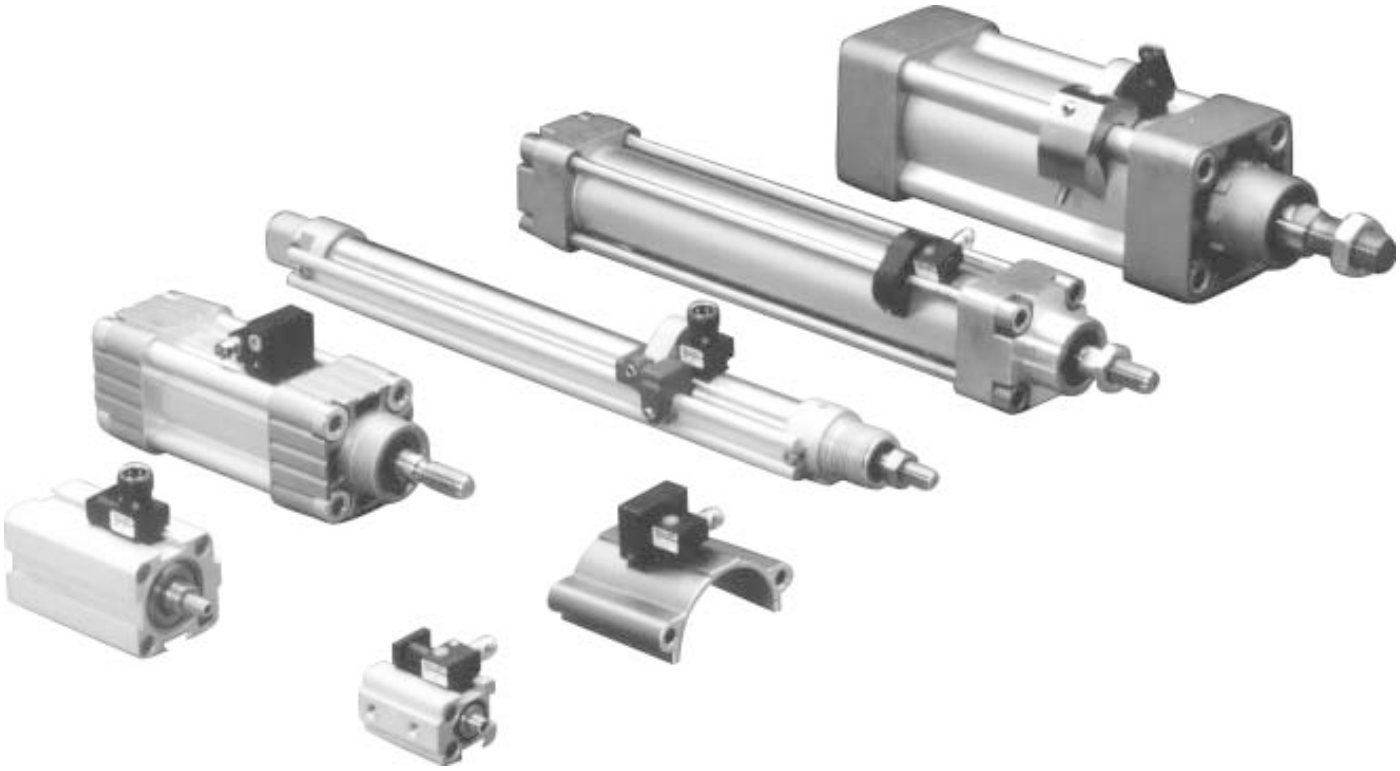
BMF 21-HW-10/BMF 21-HW-10-E
for pneumatic cylinder with tie rod
any piston diameter
tie rod diameter up to 17 mm
for pneumatic cylinder with integral
tie rod (profile)
any piston diameter
profile width up to 17 mm
BMF 21-HW-10-E: stainless steel 1.4305

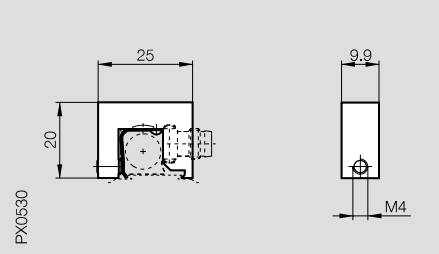




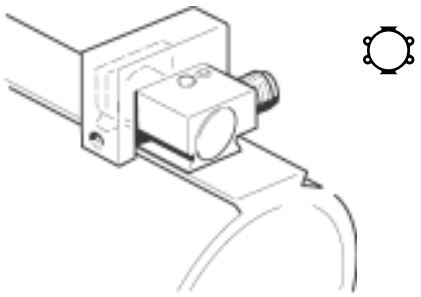
BMF 21-HW-11
for pneumatic cylinder without tie
rod/rail
piston diameter 8...80 mm
bracket for use only with tube cuff
please order tube cuff separately
(see page **3.**15).

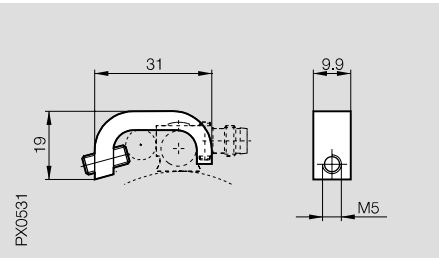




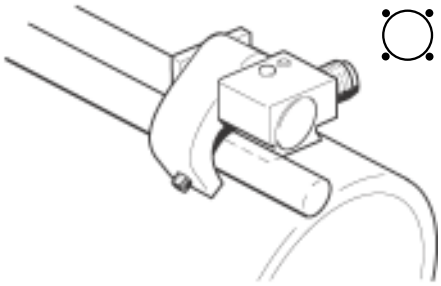


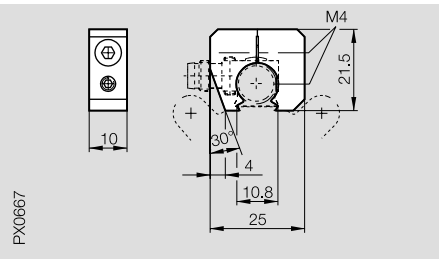
BMF 32-HW-12
for pneumatic cylinder with
trapezoidal rail (Rexroth-Mecman)
any piston diameter



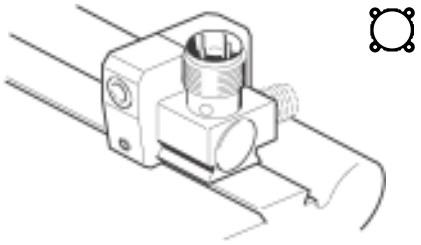


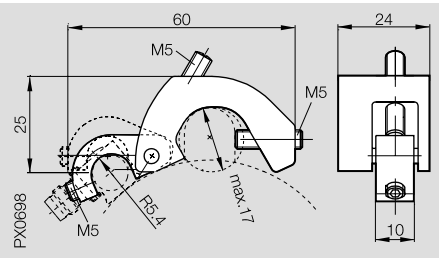
BMF 32-HW-13
for pneumatic cylinder with tie rod
any piston diameter
tie rod diameter max. 11 mm



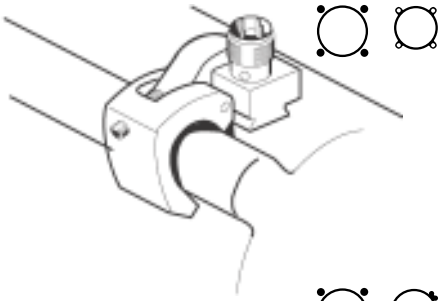


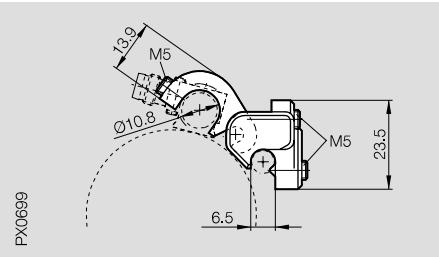
BMF 32-HW-14
for pneumatic cylinder with
trapezoidal rail (Bosch) type:
0 822 350/351/352/353/354/355
any piston diameter





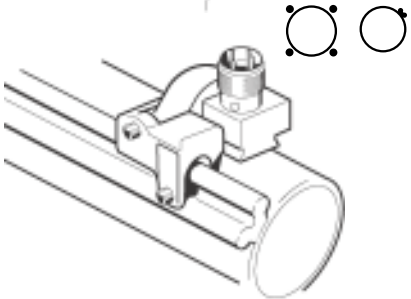
BMF 32-HW-15
for pneumatic cylinder with tie rod
any piston diameter
tie rod diameter up to 17 mm
for pneumatic cylinder with integral
tie rod (profile)
any piston diameter
profile width up to 17 mm

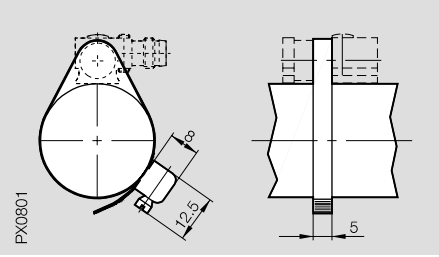




BMF 32-HW-16
for pneumatic cylinder with tie rod
any piston diameter
tie rod diameter up to 6.5 mm

pneumatic cylinder with DUO rail
(Festo), any piston diameter

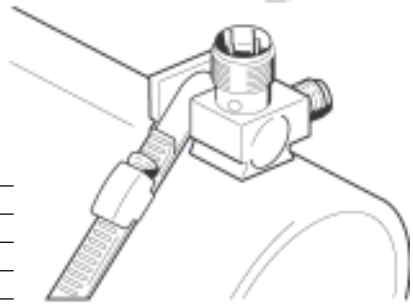




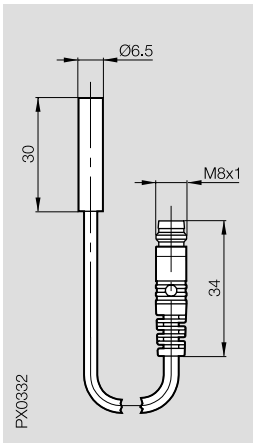
BMF Tube cuff size 1...8
stainless steel for pneumatic cylinder
without tie rod/rail
piston diameter 8...80 mm

Piston Ø	Tube cuff size for BMF 21-HW-11	Tube cuff size for BMF 32
8, 10	1	1
12	1	2
16, 20	2	2
25	2	3
32	3	3
40	4	4
50	5	5
63	6	8
80	7	7

Tube cuff size _ please order separately

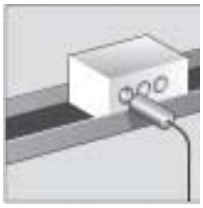


Series	**BMF 07M**
Housing size	∅ 6.5 mm



Some advantages of magnetic field sensors in the classic inductive sensors housing.

- Significantly greater switching distances compared with the same size inductive sensor
- Sensing through walls made of colored metal and aluminum, without reduced switching distances
- Reacts only to magnetic fields; no faulty switching by metal shavings or other metal parts
- Can be actuated from the front or side
- Magnet can be flush mounted in steel
- Protected against polarity reversal
- Supply voltage 10...30 V
- Responds to north or south poles
- Semiconductor sensor wear-free
- Vibration insensitive
- Output protected against inductive peaks
- Short circuit protected

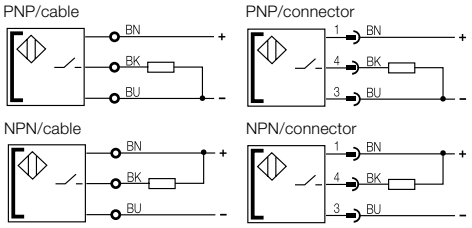


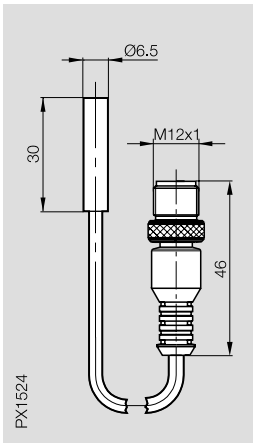
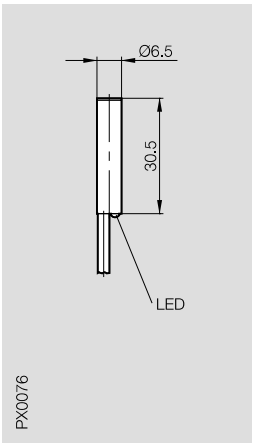
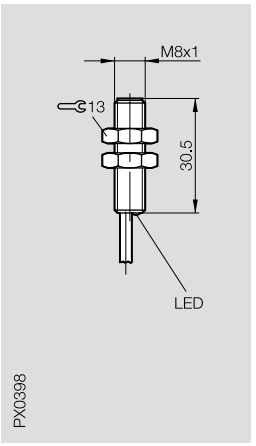
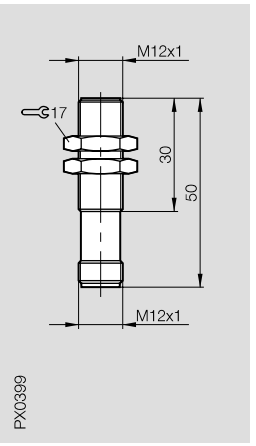
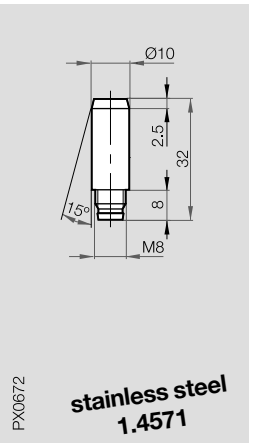
PNP	Normally-open	BMF 07M-PS-D-2-S49-
NPN	Normally-open	BMF 07M-NS-D-2-S49-
Rated operating field strength I H_n I		1.2 kA/m
Assured operating field strength I H_a I		≥ 2 kA/m
Hysteresis of I H_n I		≤ 45 %
Temperature drift of turn-on point of I H_n I		≤ 0.3 %/°C
Supply voltage U_B		10...30 V DC
Voltage drop U_d		≤ 2.5 V
Rated insulation voltage U_i		75 V DC
Rated operational current I_e		200 mA
No-load supply current I_0 max.		≤ 12 mA
Off-state current I_r		≤ 80 µA
Protected against polarity reversal		yes
Short circuit protected		yes
Load capacity		≤ 1 µF
Ambient temperature range T_a		–25...+70 °C
Utilization category		DC 13
Degree of protection per IEC 60529		IP 67
Housing material		CuZn nickel plated
Connection		cable with connector
No. of wires × conductor cross section		
Approval		cULus
Recommended connector		BKS-B 48

Please add the cable length to the ordering code for sensors with **cable!**
PU-03, PU-05 = PUR, length 3 m or 5 m

Please add the cable length to the ordering code for sensors with **cable and connector!**
00,2, 00,5 = PUR, length 0.2 m or 0.5 m

Wiring diagrams



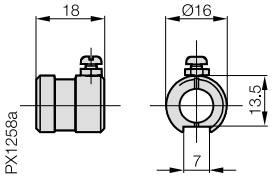
	BMF 07M	BMF 07M	BMF 08M	BMF 12M	BMF 10E
					for foods industry
					bracket BMF 10E-HW-19
	∅ 6.5 mm	∅ 6.5 mm	M8×1	M12×1	∅ 10 mm
					
	BMF 07M-PS-D-2-S 4-	BMF 07M-PS-C-2-KPU-	BMF 08M-PS-C-2-KPU-	BMF 12M-PS-D-2-S 4	BMF 10E-PS-D-2-SA 1-S49
		BMF 07M-NS-C-2-KPU-	BMF 08M-NS-C-2-KPU-	BMF 12M-NS-D-2-S 4	
	1.2 kA/m	1.2 kA/m	1.2 kA/m	1.2 kA/m	1.2 kA/m
	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m
	≤ 45 %	≤ 45 %	≤ 45 %	≤ 45 %	≤ 45 %
	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C
	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
	≤ 2.5 V	≤ 2.5 V	≤ 3.1 V	≤ 2.5 V	≤ 2.5 V
	75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
	200 mA	200 mA	200 mA	200 mA	200 mA
	≤ 12 mA	≤ 22 mA	≤ 22 mA	≤ 12 mA	≤ 12 mA
	≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA
	yes	yes	yes	yes	yes
	yes	yes	yes	yes	yes
	≤ 1 µF	≤ 1 µF	≤ 1 µF	≤ 1 µF	≤ 1 µF
	–25...+70 °C	–25...+70 °C	–25...+70 °C	–25...+70 °C	–25...+70 °C
	DC 13	DC 13	DC 13	DC 13	DC 13
	IP 67	IP 67	IP 67	IP 67	IP 67
	CuZn nickel plated	CuZn nickel plated	CuZn nickel plated	CuZn nickel plated	**stainless steel 1.4571**
	cable with connector	cable	cable	connector	connector
		3 × 0.14 mm²	3 × 0.14 mm²		
	cULus	cULus	cULus	cULus	
	BKS-B 19			BKS-B 19/BKS-B 20	BKS-B 48/BKS-B 49

Operating distance magnet – sensor

Magnet type	Samarium-Cobalt	Hard ferrite	Strontium-Ferrite
			
Ordering code	630 620 260	350 620 961	320 709 084
Housing size	16 × 12 mm	∅ 10 mm	∅ 4 mm
Height	3 mm	10 mm	5 mm
Assured operating distance S_a	28 mm	15 mm	5 mm
Hysteresis	8 mm	2 mm	2 mm

Within the operating zone scheduled, a secure switch is guaranteed. The operating zones have been determined in measuring series and help to choose a magnet suitable.

Bracket
BMF 10E-HW-19
(please order separately)



Piston-∅	Tube cuff size
8, 10, 12	2
16, 20, 25	3
32	4
40	5
50	6
63	8

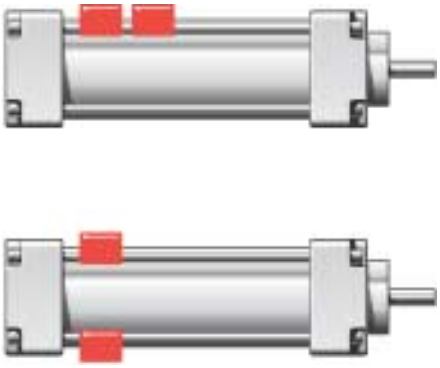
Tube cuff size _ please order separately

3
Connectors selection guide page 3.20 ...

6
Connectors, clamps ... page 6.2 ...

Mounting distances

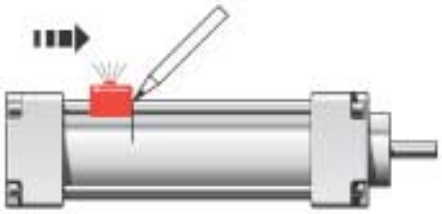
The response travel of a magnetic field sensitive sensor is virtually independent of the field strength of typical piston magnets. Still the sensor does not exhibit false switching. When using more than one of the magnetic field switches, the BMF sensors can be mounted directly next to or beside each other.



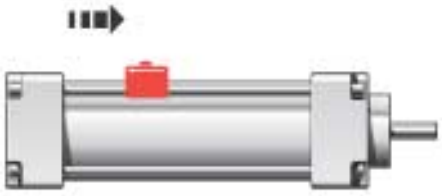
Adjustment and installation

1. Set piston to end of travel.

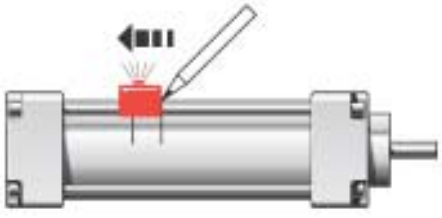
2. Slide sensor (with power on) until the output turns on (LED on). Mark front edge of sensor on cylinder.



3. Continue to slide the sensor until the output is off (LED off).



4. Slide sensor back to 2nd turn-on point. Mark front edge of sensor on cylinder.



5. Fasten sensor down with front edge is between the two marked points.

Response distances

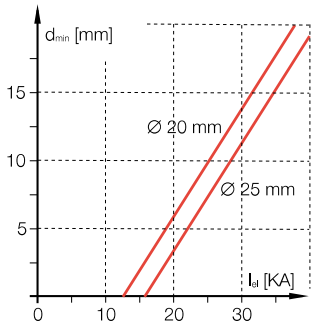
Ø cylinder	BMF 303	BMF 305/BMF 21/BMF 10E	BMF 307	BMF 32	BMF 32...W...
32 mm	10.0 mm	3.6 mm	9.7 mm	4.2 mm	7.2 mm
40 mm	9.1 mm	4.1 mm	10.1 mm	5.1 mm	5.1 mm
50 mm	13.0 mm	4.8 mm	12.4 mm	5.3 mm	6.5 mm
63 mm	12.4 mm	4.9 mm	11.9 mm	5.4 mm	9.4 mm
80 mm	13.0 mm	5.1 mm	12.6 mm	5.7 mm	8.5 mm
100 mm	13.1 mm	5.9 mm	13.3 mm	5.8 mm	8.8 mm
Hysteresis	1...2 mm	0.5...1 mm	0.5...1 mm	1...1.5 mm	1.5...2 mm

The indicated values represent measured guidelines.

Differences may arise due to different types of pistons and magnets.

Using in AC welding environments

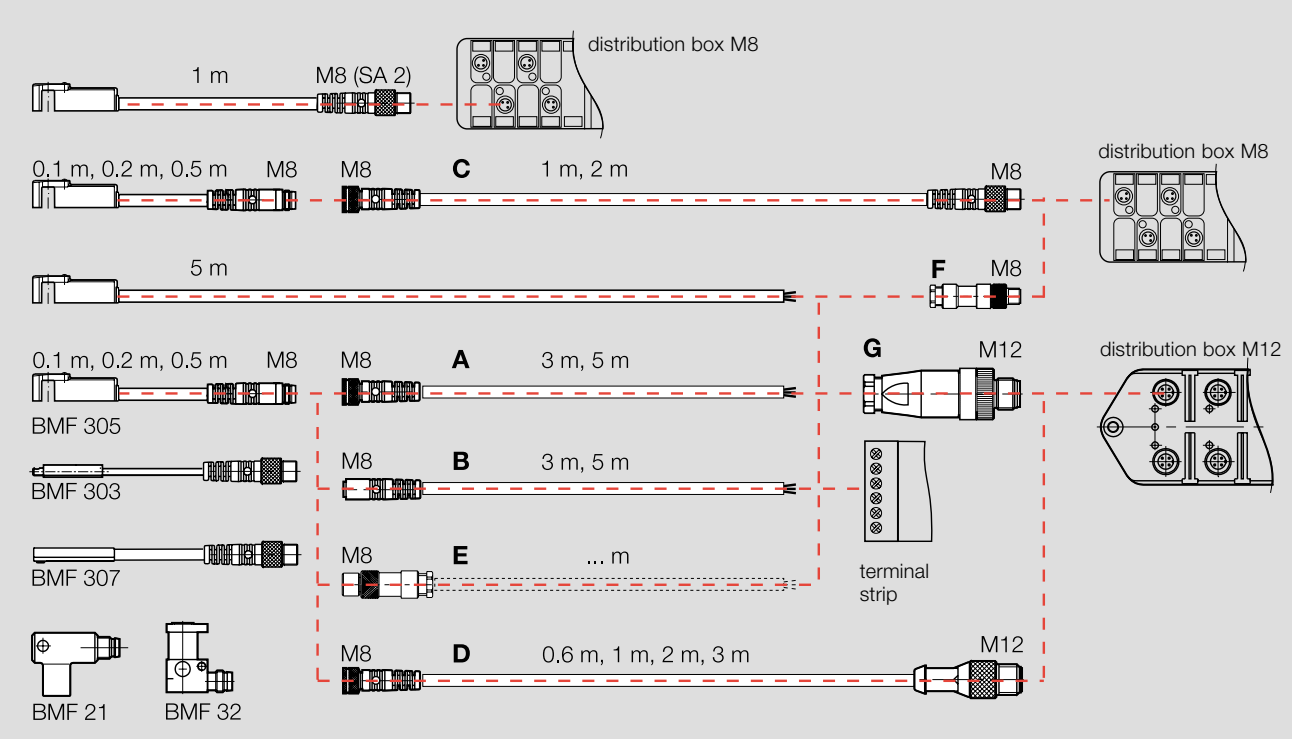
The BMF 305M/32M-..-**W**-.. magnetic field sensors can be operated in external fields up to a field strength of E_{max} = 200 kA/m.
This limit is often exceeded in the direct vicinity of high current lines, e. g. welding equipment. The sensor should therefore be mounted at a distance d_{min} from such lines, as shown in the diagram below showing the relationship between current and conductor diameter.



3

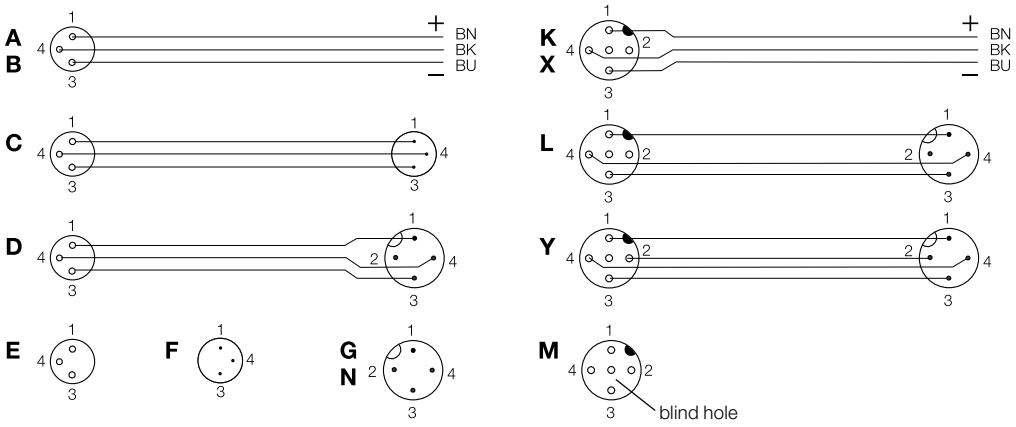
Wiring versions for M8 (BMF-...-S49)

Select the appropriate cable from the magnetic field sensor to your control.



	Type/version	Fastening	Material	Length	Ordering code
A	straight coupling M8 with molded-in cable	threaded ring M8, self-securing	PVC	3 m	BKS-B 48-1-03
			PVC	5 m	BKS-B 48-1-05
			PUR	3 m	BKS-B 48-1-PU-03
			PUR	5 m	BKS-B 48-1-PU-05
B	straight coupling M8 with molded-in cable	ratchet (for M8)	PVC	3 m	BKS-B 41-1-03
			PVC	5 m	BKS-B 41-1-05
			PUR	3 m	BKS-B 41-1-PU-03
			PUR	5 m	BKS-B 41-1-PU-05
C	straight coupling M8 with cable and straight connector M8	threaded ring M8, threaded ring M8	PUR	1 m	BKS-B 48-1/GS 49-PU-01
			PUR	2 m	BKS-B 48-1/GS 49-PU-02
D	straight coupling M8 with cable and straight connector M12	threaded ring M8, threaded ring M12, self-securing	PUR	0.6 m	BKS-B 48-1/GS 4-PU-00,6
			PUR	1 m	BKS-B 48-1/GS 4-PU-01
			PUR	2 m	BKS-B 48-1/GS 4-PU-02
			PUR	3 m	BKS-B 48-1/GS 4-PU-03
E	straight coupling M8, solder contacts 3-pin	threaded ring M8			BKS-S 81-00
F	straight connector M8, solder contacts 3-pin	threaded ring M8			BKS-S 82-00
G	straight connector M12, screw contacts 4-pin	threaded ring M12			RSC 4/7

Connector wiring



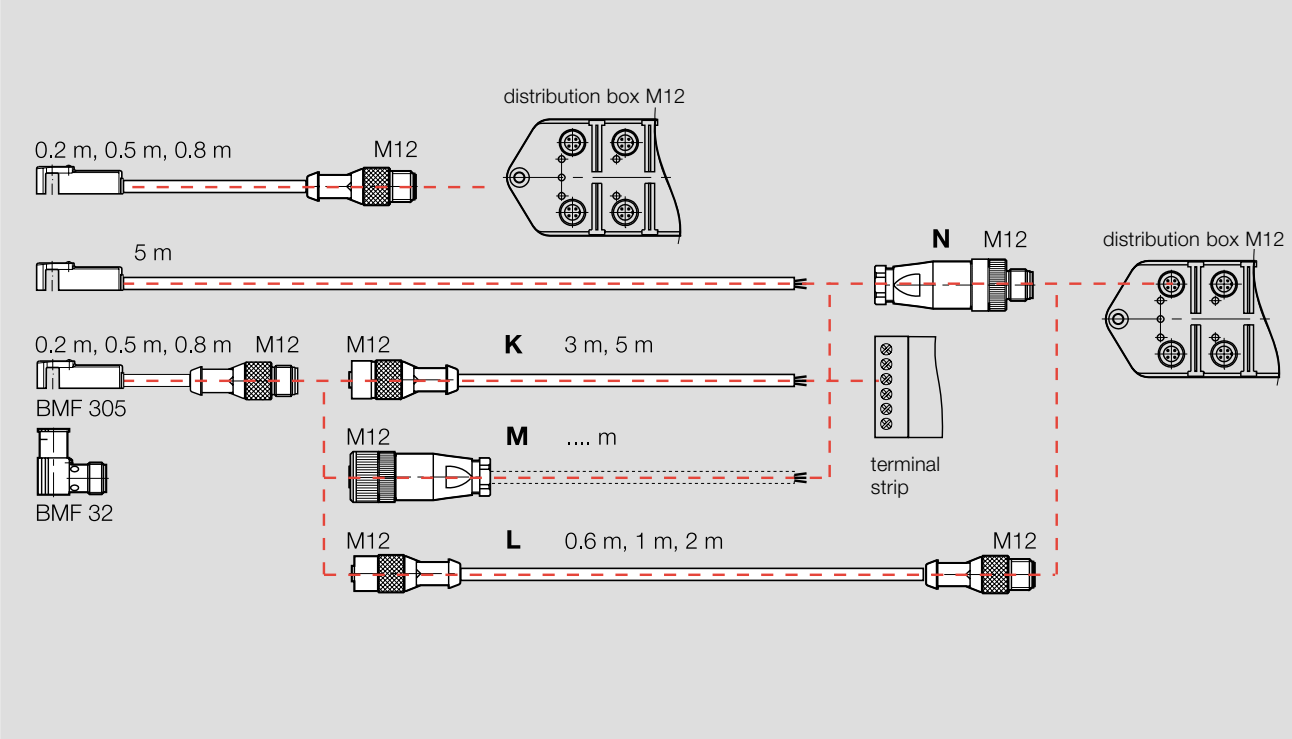
front view of pins/sockets

Wire colors

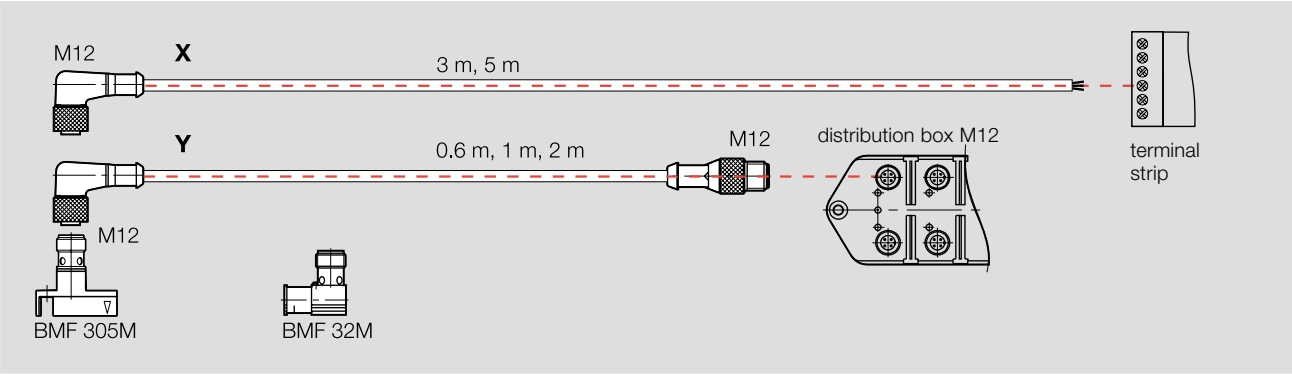
coding as per DIN IEC 60757

BN	brown
BK	black
BU	blue

Wiring versions for M12 (BMF-...-S 4)
Select the appropriate cable from the magnetic field sensor to your control.



	Type/version	Fastening	Material	Length	Ordering code
K	straight coupling M12 with molded-in cable	threaded ring M12, self-securing	PVC	3 m	BKS-B 19-1-03
			PVC	5 m	BKS-B 19-1-05
			PUR	3 m	BKS-B 19-1-PU-03
			PUR	5 m	BKS-B 19-1-PU-05
L	straight coupling M12 with cable and straight connector M12	threaded ring M12,	PUR	0.6 m	BKS-B 19-1/GS 4-PU-00,6
		threaded ring M12, self-securing	PUR	1 m	BKS-B 19-1/GS 4-PU-01
			PUR	2 m	BKS-B 19-1/GS 4-PU-02
M	straight coupling M12, screw contacts 4-pin	threaded ring M12			BKS-S 10-3
N	straight connector M12, screw contacts 4-pin	threaded ring M12			RSC 4/7



	Type/version	Fastening	Material	Length	Ordering code
X	right angle coupling M12 with molded-in cable	threaded ring M12, self-securing	PVC	3 m	BKS-B 20-1-03
			PVC	5 m	BKS-B 20-1-05
			PUR	3 m	BKS-B 20-1-PU-03
			PUR	5 m	BKS-B 20-1-PU-05
Y	right angle coupling M12 with cable and straight connector M12	threaded ring M12,	PUR	0,6 m	BKS-B 20-3/GS 4-PU-00,6
		threaded ring M12, self-securing	PUR	1 m	BKS-B 20-3/GS 4-PU-01
			PUR	2 m	BKS-B 20-3/GS 4-PU-02