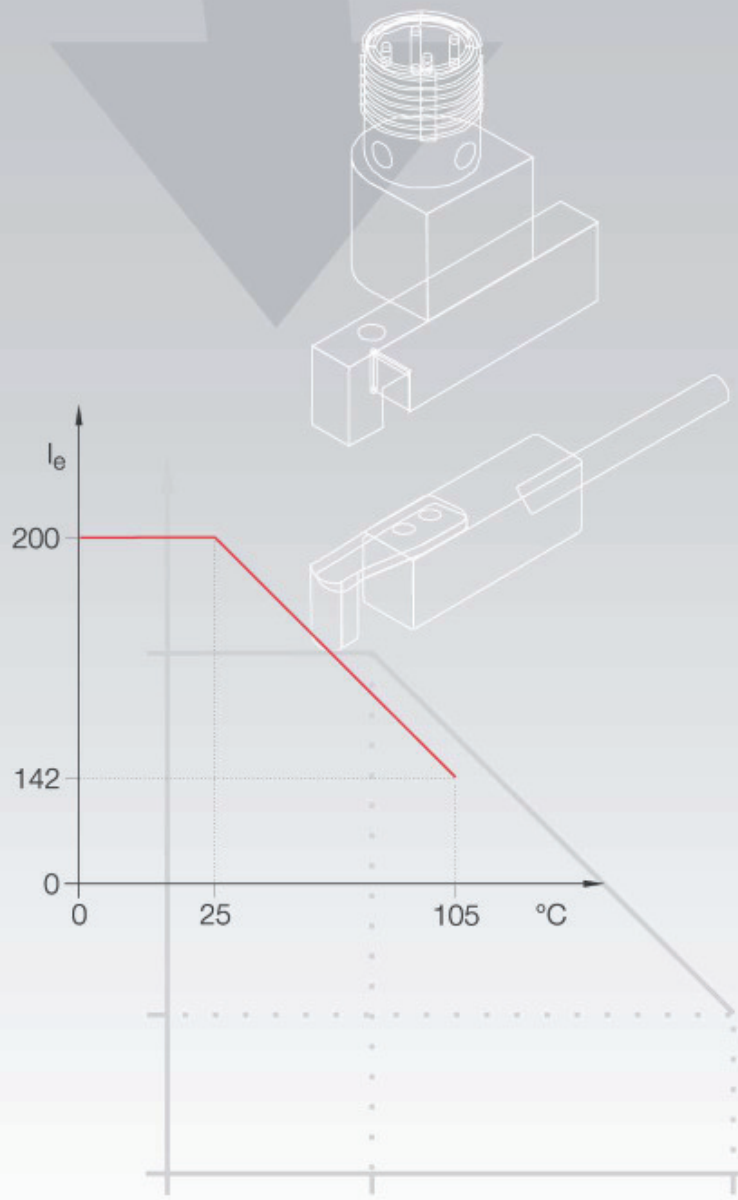
Sensors for Pneumatic Cylinders

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



3.0

Series		BMF 103	BMF 273	BMF 303	BMF 305K	BMF 305M
						
		mini.s	**mini.s**	**mini.s**	**All-rounder**	**Special**
for cylinder types						
C-slot		HW-41/HW-42	■	HW-28/HW-30	HW-32 (Norgren)	HW-32 (Norgren)
T-slot		HW-43		HW-33/40/51	HW-17/20/22/23/26	HW-17/20/22/23/26
Trapezoidal slot				HW-44	HW-25	HW-25
Trapezoidal guide					HW-27	HW-27
Round cylinder				HW-59/HW-61/ HW-80	HW-24	HW-24
Tie rod cylinder					HW-21+HW-8/ HW-21+HW-10	HW-21+HW-8/ HW-21+HW-10
for flush mounting			■	■		
without mounting bracket			■			
Connections						
Connector						M8 and M12
Cable and connector		M5 and M8	M8	M5 and M8	M8 and M12	
Cable		■	■	■	■	
Output types						
PNP NO	3-wire	10...30 V	10...30 V	10...30 V	10...30 V	10...30 V
PNP NC	3-wire	10...30 V	10...30 V	10...30 V	10...30 V	
NPN NO	3-wire	10...30 V	10...30 V	10...30 V	10...30 V	
NPN NC	3-wire		10...30 V	10...30 V	10...30 V	
PNP NO Weld-immune	3-wire					10...30 V
PNP NO Reed	3-wire				10...30 V	
Non-polarized AC/DC Reed	2-wire				6...240 V AC/DC	
Housing						
Plastic		LCP	PBT	LCP	LCP	
Metal						Al
Characteristics						
Short circuit protected		■	■	■	■	■
Polarity reversal protected		■	■	■	■	■
CE		■	■	■	■	■
UL		■	■	■	■	■
Unique features						
		Optimized for short-stroke cylinders, compact design	Can be inserted in C-slot from above, integrated holder	Integrated in C-slot, mini design	Universal sensor	Universal sensor, metal housing, weld-immune, temperature rated
Page		**3.1.**2	**3.1.**4	**3.1.**6	**3.1.**8	**3.1.**9

	BMF 307	BMF 315K	BMF 315M	BMF 21	BMF 32	BMF 10E
						
	Compact	**Compact**	**Special**	**Classic**	**Classic**	**Special**
	■	■	■			
					HW-12/14/18	
	HW-73	HW-73	HW-73	HW-11	Hose clamp	HW-49 and hose clamp
				HW-8/HW-10/ HW-10E	HW-13/HW-15	HW-49 and hose clamp
	■	■	■			
	■	■	■		■	
				M8	M8 and M12	M8
	M8	M8 and M12	M8 and M12			
	■	■	■	■		
	10...30 V	10...30 V	10...30 V	10...30 V	10...30 V	10...30 V
	10...30 V	10...30 V				
	10...30 V	10...30 V		10...30 V	10...30 V	
	10...30 V	10...30 V				
			10...30 V		10...30 V	
	4...30 V AC/DC					
	LCP	PA 66		PBT		
			Al		Al	**Stainless steel 1.4571**
	■	■	■	■	■	■
	■	■	■	■	■	■
	■	■	■	■	■	■
	■	■	■	■	■	■
	integrated holder	Can be inserted in T-slot from above, integrated holder	Can be inserted in T-slot from above, Integrated holder, metal housing, weld-immune, temperature rated	for tie rod cylinders	For tie rod cylinders, metal housing, weld immune	for the foods industry
	3.1.15	**3.1.**17	**3.1.**18	**3.1.**20	**3.1.**22	**3.1.**24

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Use

Magnetic field, electronic sensors in the BMF series detect the piston position in pneumatic and hydraulic cylinders and grippers.

Depending on the model, the sensor housing will be made of plastic, aluminum, brass or stainless steel.

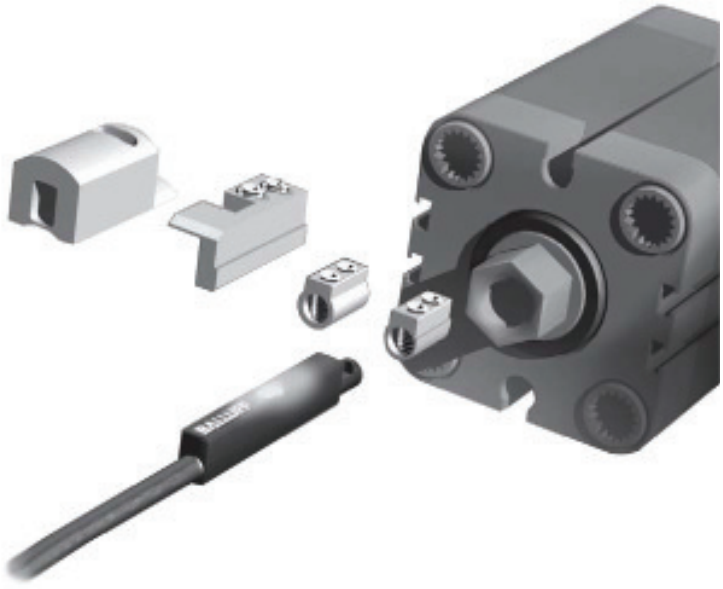
Balluff offers a comprehensive variety of BMF form factors and mounting brackets for your pneumatic cylinders. Most require only one sensor model with various mounting brackets for the different cylinder manufacturers and sizes. This reduces your inventory costs. Mounting with our brackets allows sensors to be replaced without losing your switchpoints.

Function

Permanent magnets are installed in the piston ring of the pneumatic cylinder which are sensed by the magnetic field sensor through the cylinder wall. As the piston approaches, the sensor changes its output signal state.

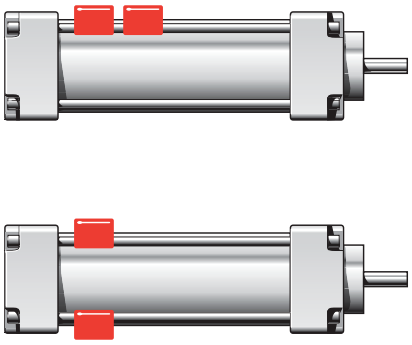
Advantages

- Reliable, bounce-free switching
- Long service life
- Non-contact, wear-free piston sensing
- Resensitized to contamination
- Detects piston position through the cylinder wall
- Space-saving design, small sizes and shapes
- Can be installed on any
- cylinder using the appropriate mounting bracket
- Significantly greater switching distances for the same size
- Switches through alloy and aluminum walls without a reduction in switching distance
- Magnet can be flush mounted in steel
- Polarity reversal protected
- Supply voltage 10...30 V DC
- Responds to both magnetic field directions equally
- Solid-state, wear-free
- Insensitive to vibration
- Short circuit protected
- Housing material is highly resistant to aggressive media



Mounting distances
Adjustment
and installation

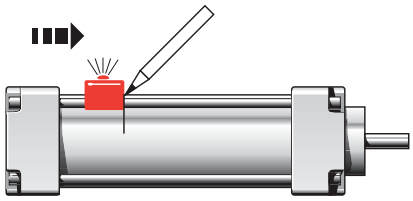
The response travel of a magnetic field sensitive sensor is virtually independent of the field strength of typical piston magnets. This design and operating principle eliminates multiple switchpoints.
When using more than one of the magnetic field switches, these BMF sensors can be mounted directly next to or beside each other.



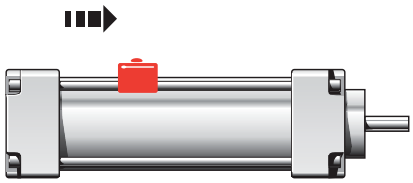
Adjustment
and installation

1. Set piston to end position.

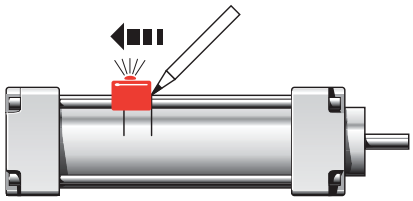
2. Slide sensor (with power on) until 1st turn-on point (LED on). Mark edge of sensor on cylinder.



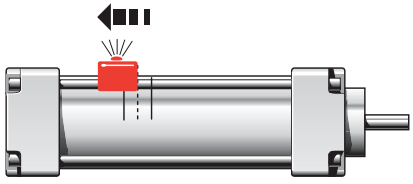
3. Continue to slide the sensor until the output is off (LED off).



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



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



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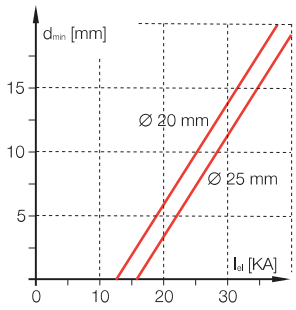
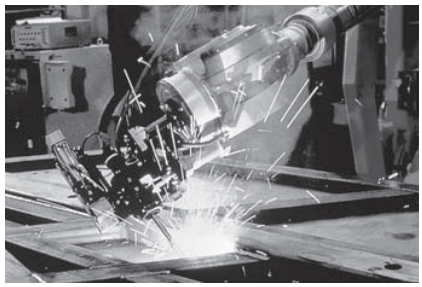
Using in AC welding environments

The BMF 305M/ 315M/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.

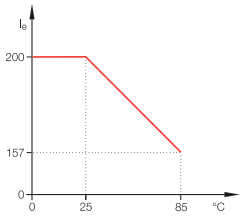
The sensor should therefore be mounted at a distance d_{min} from such lines, as shown in the diagram below showing the relationship between current and conductor diameter.



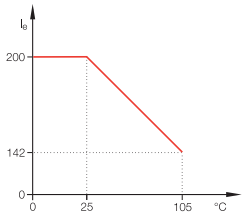


Temperature load curve

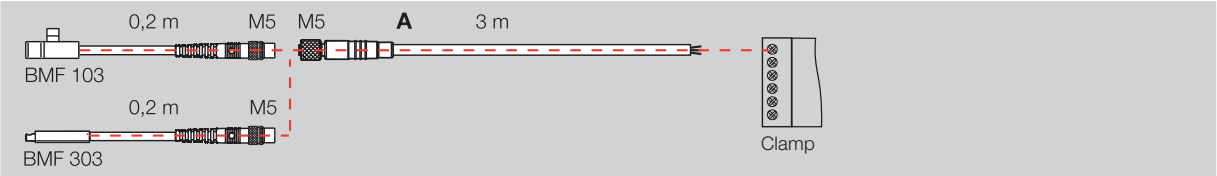
For series BMF 10E, BMF 21, BMF 32, BMF 305, BMF 307, BMF 315



For series BMF 305M...SA4 and BMF 315M...SA3 (extended temperature range) –25...+105 °C

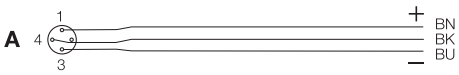


Wiring versions M5 (BMF-...-S26)
Select the appropriate cables from the BMF sensor for your controller.



	Type/version	Fastening	Material	Length	Ordering code
A	Straight coupling M5 with molded-in cable	Threaded ring M5	PUR	3 m	BKS-B25-1-PU-03

Connector wiring M5 (BMF-...-S26)



Top view of socket/pins

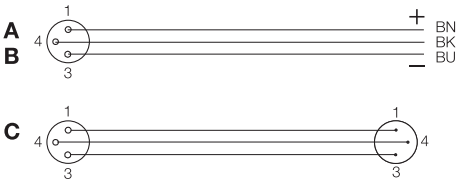
Wire colors
Coding per DIN IEC 60757

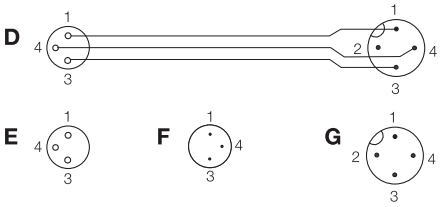
BN	brown
BK	black
BU	blue

BKS-S4-TM1-01
BKS-S49-TM1-02

BSB-04-P01P/4-M02K-HKP-_ _

Straight M5 coupling M8 (BMF-...-S49)



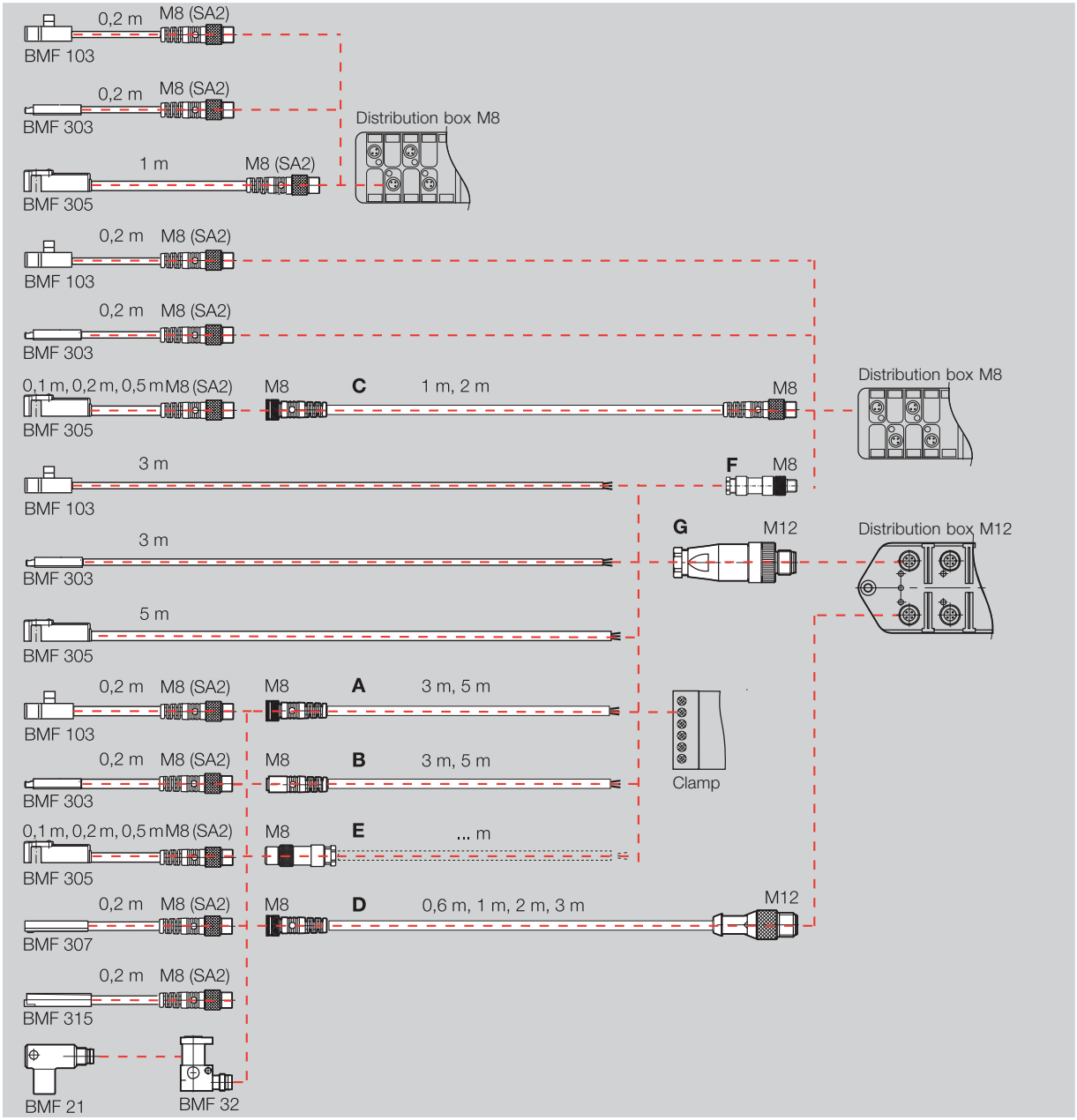


Wire colors
Coding per DIN IEC 60757

BN	brown
BK	black
BU	blue

Top view of socket/pins

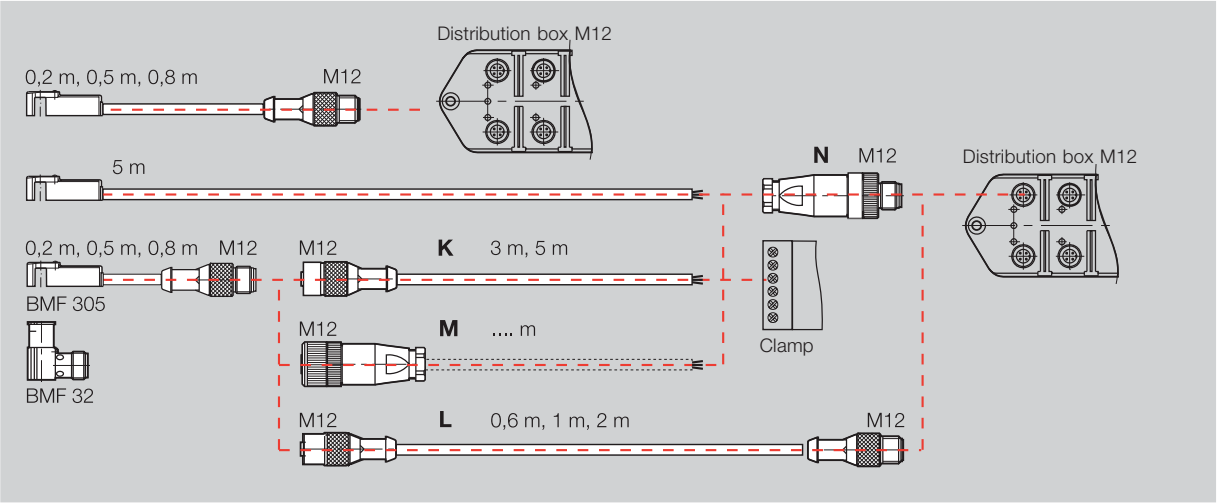
Wiring versions for M8 (BMF-...-S4)
Select the appropriate cables from the BMF sensor for your controller.



	Type/version	Fastening	Material	Length	Ordering code
A	Straight coupling M8 with molded-in cable	threaded ring M8 self-securing	PVC	3 m	BKS-_ 48-1-03
			PVC	5 m	BKS-_ 48-1-05
			PUR	3 m	BKS-_ 48-1-PU-03
			PUR	5 m	BKS-_ 48-1-PU-05
B	Straight coupling M8 with molded-in cable	ratchet (for M8)	PVC	3 m	BKS-S 41-1-03
			PVC	5 m	BKS-S 41-1-05
			PUR	3 m	BKS-S 41-1-PU-03
			PUR	5 m	BKS-S 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/GS49-PU-01
			PUR	2 m	BKS-B 48-1/GS49-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-S 48-1/GS4-PU-00,6
			PUR	1 m	BKS-S 48-1/GS4-PU-01
			PUR	2 m	BKS-S 48-1/GS4-PU-02
			PUR	3 m	BKS-S 48-1/GS4-PU-03
E	Straight coupling M8, 3-pole solder contacts	threaded ring M8			BKS-S 81-00
F	straight connector M8, 3-pole solder contacts*	threaded ring M8			BKS-S 82-00
G	straight connector M12, 4-pole screw contacts*	threaded ring M12			RSC 4/7

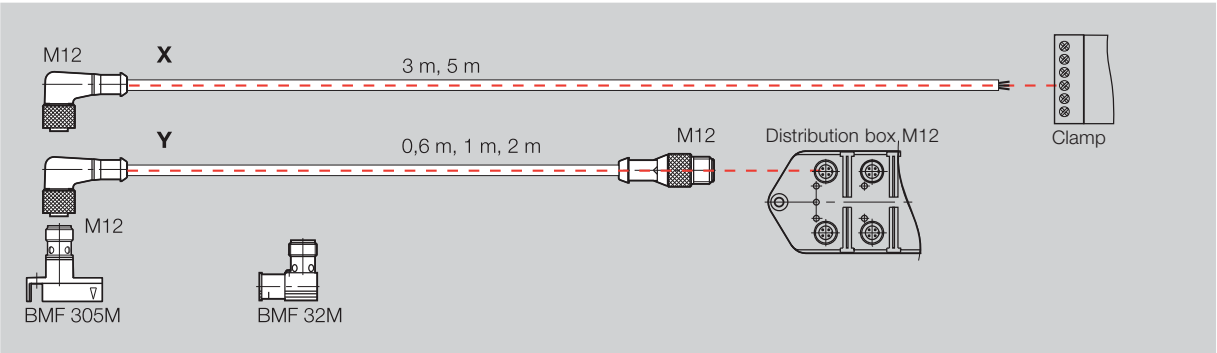
*Insulation displacement and screw contact

Wiring versions for M12 (BMF-...-S4)
Select the appropriate cables from the BMF sensor for your controller.



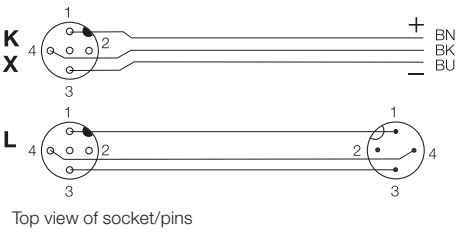
	Type/version	Fastening	Material	Length	Ordering code
K	straight coupling M12 with molded-in cable	threaded ring M12 self-securing	PVC	3 m	BKS-_ 19-1-03
			PVC	5 m	BKS-_ 19-1-05
			PUR	3 m	BKS-_ 19-1-PU-03
			PUR	5 m	BKS-_ 19-1-PU-05
L	straight coupling M12 with cable and straight connector M12	threaded ring M12, threaded ring M12 self-securing	PUR	0.6 m	BKS-S 19-1/GS4-PU-00,6
			PUR	1 m	BKS-S 19-1/GS4-PU-01
			PUR	2 m	BKS-S 19-1/GS4-PU-02
M	Straight coupling M12, 4-pole screw contacts*	threaded ring M12			BKS-S 10-3
N	straight connector M12, 4-pole screw contacts	threaded ring M12			RSC 4/7

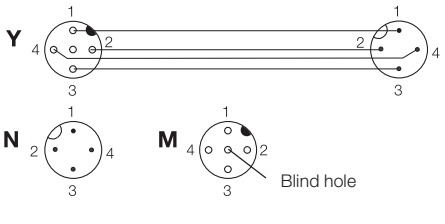
*Insulation displacement and screw contact



	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-_ 20-1-03
			PVC	5 m	BKS-_ 20-1-05
			PUR	3 m	BKS-_ 20-1-PU-03
			PUR	5 m	BKS-_ 20-1-PU-05
Y	right angle coupling M12 with cable and straight connector M12	threaded ring M12, threaded ring M12 self-securing	PUR	0.6 m	BKS-S 20-3/GS4-PU-00,6
			PUR	1 m	BKS-S 20-3/GS4-PU-01
			PUR	2 m	BKS-S 20-3/GS4-PU-02

Pin configurations





Wire colors
Coding per DIN IEC 60757

BN	brown
BK	black
BU	blue

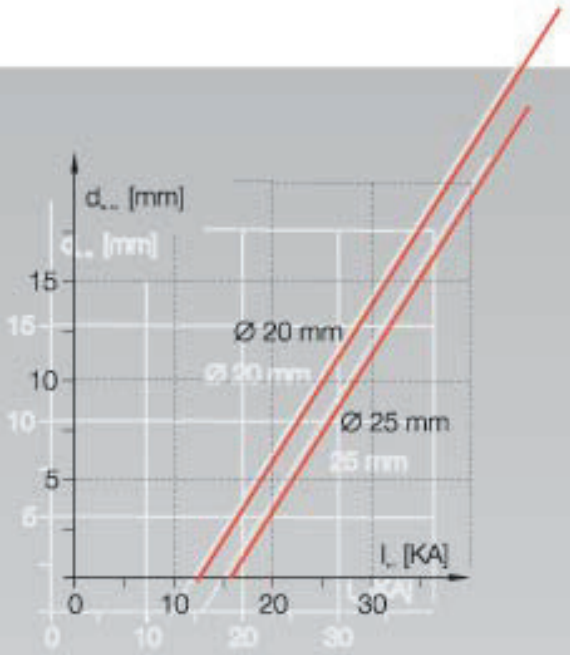
3.0

Hose clamp matrix

Piston ∅	**BMF 303-HW-59** with **hose clamp BMF size _**	**BMF 305-HW-24** with **hose clamp BMF size _**	**BMF 21-HW-11** with **hose clamp BMF size _**	**BMF 32** with **hose clamp BMF size _**	**BMF 10E-HW-19** with **hose clamp BMF size _**
≤ 8		0			
8...10	1	1	1	1	2
12	2	1	1	1	2
16	2	1	2	2	3
20	2	2	2	2	3
25	2	2	2	2	3
32	3	3	3	3	4
40	4	4	4	4	5
50	5	5	5	5	6
63	6	6	6	6	8
80	7	7	7	7	

Please append size to part number!

Sensors for Pneumatic Cylinders

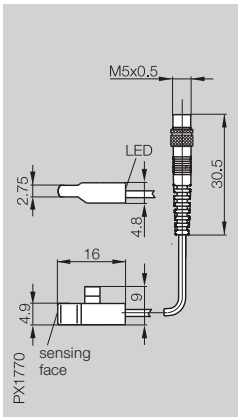


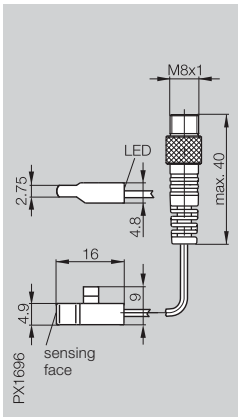
Magnetic field sensors respond to an external magnetic field. Their main area of application is sensing piston positions in pneumatic cylinders.

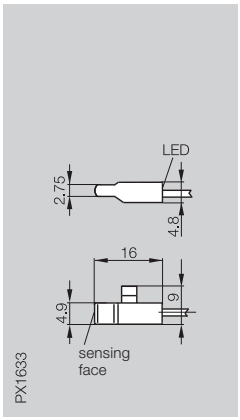
3.1

Series	**BMF 103**	**BMF 103**	**BMF 103**
Type	Connector M5×0.5 with rotatable union nut	Connector M8×1 with rotatable union nut	

The sensor for positioning monitoring on miniature grippers and miniature cylinders with C- or T-slot. Highly precise switching response for monitoring even the smallest piston movements.







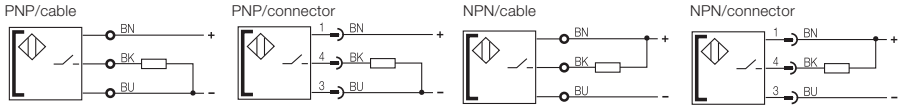
PNP	NO	BMF 103K-PS-C-2A-S26-00,3	BMF 103K-PS-C-2A-SA2-S49-00,3	BMF 103K-PS-C-2A-PU-02
	NC		BMF 103K-PO-C-2A-SA2-S49-00,3	BMF 103K-PO-C-2A-PU-02
NPN	NO		BMF 103K-NS-C-2A-SA2-S49-00,3	BMF 103K-NS-C-2A-PU-02

Rated operating field strength $\|H_n\|$	1.2 kA/m	1.2 kA/m	1.2 kA/m
Assured operating field strength $\|H_a\|$	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m
Hysteresis of $\|H_n\|$	≤ 45 %	≤ 45 %	≤ 45 %
Temperature drift of turn-on point of $\|H_n\|$	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C
Turn-on delay	≤ 0.07 ms	≤ 0.07 ms	≤ 0.07 ms
Turn-off delay	≤ 0.07 ms	≤ 0.07 ms	≤ 0.07 ms
Supply voltage U_B	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
Rated insulation voltage U_i	75 V DC	75 V DC	75 V DC
Rated operational current I_e	100 mA	100 mA	100 mA
No-load supply current I_0 max.	≤ 5 mA	≤ 5 mA	≤ 5 mA
Polarity reversal protected	yes	yes	yes
Short circuit protected	yes	yes	yes
Ambient temperature range T_a	–25...+70 °C	–25...+70 °C	–25...+70 °C
Utilization category	DC 13	DC 13	DC 13
Degree of protection per IEC 60529	IP 67	IP 67	IP 67
Housing material	LCP	LCP	LCP
Connection	0.3 m cable (PUR) with connector	0.3 m cable (PUR) with connector	2 m Cable PUR
No. of wires × cross-section			3×0.10 mm²
Approval	cULus	cULus	cULus
Recommended connector	BKS-_ 25	BKS-_ 48	

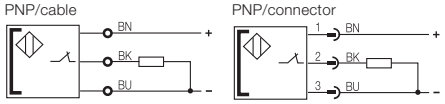
Other cable lengths on request.

Wiring diagrams

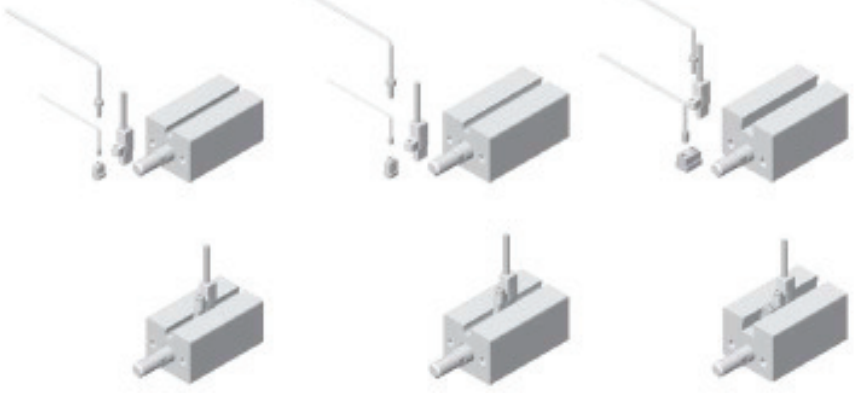
NO



NC



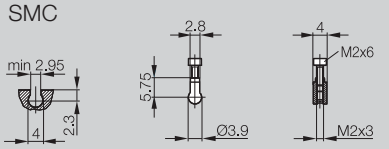
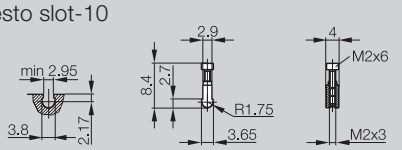
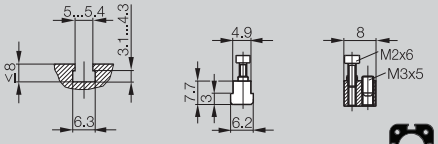
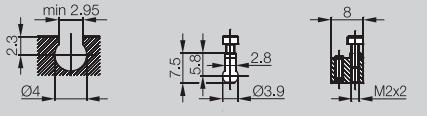
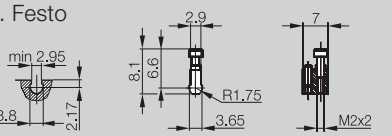
BMF 103-HW-41 BMF 103-HW-42 BMF 103-HW-43



Advantages

Switchpoint can be adjusted in seconds! Turn screw one revolution, adjust position, tighten.

Switchpoint cannot be lost. Even if you replace the sensor, the adjusted switchpoint is determined by the mounting bracket, not the sensor.

Ordering code	Advantages	Cylinder type	Mounting brackets
BMF 103-HW-41 		C-slot e.g. SMC 	PX1663
BMF 103-HW-42 		C-slot Festo slot-10 	PX1664
BMF 103-HW-43 		T-slot e.g. Festo slot-8, Bosch, SMC 	PX1665
BMF 103-HW-85 		C-slot e.g. SMC, Bimba 	PX1663a
BMF 103-HW-87 		C-slot e.g. Festo 	PX1664a

Cable clip for routing on request

Hex Key Set

BMF Hex Key

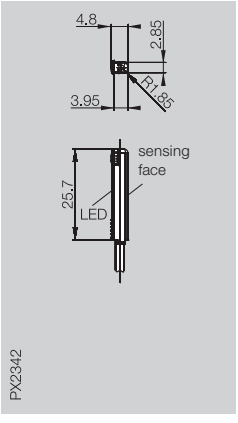
Please order accessories separately see page **5.**74

3.1 Connectors selection guide page 3.0.7 ...

5 Connectors ... page 5.2 ...

Advantages

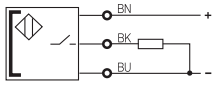
- Can be inserted in C-slot from above,
- Proven circuitry from the BMF line:
  Low hysteresis, precise switching point, can be used for cylinders and grippers with strong or weak magnets
- Rugged, compact, low-profile housing
- Can be installed without mounting bracket in cylinders with C-slot e.g. Festo, SMC.

Series		**BMF 273**	**BMF 273**
Type		Connector for direct connection to distribution box	
			
PNP	NO	BMF 273K-PS-C-2A-SA2-S49-00,3	BMF 273K-PS-C-2A-PU-02
	NC	BMF 273K-PO-C-2A-SA2-S49-00,3	
NPN	NO	BMF 273K-NS-C-2A-SA2-S49-00,3	BMF 273K-NS-C-2A-PU-02
	NC	BMF 273K-NO-C-2A-SA2-S49-00,3	
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
Turn-on delay		≤ 0.07 ms	≤ 0.07 ms
Turn-off delay		≤ 0.07 ms	≤ 0.07 ms
Supply voltage U_B		10...30 V DC	10...30 V DC
Voltage drop U_d		≤ 2.5 V	≤ 2.5 V
Rated insulation voltage U_i		75 V DC	75 V DC
Rated operational current I_e		100 mA	100 mA
No-load supply current I_0 max.		≤ 8 mA	≤ 8 mA
Polarity reversal protected		yes	yes
Short circuit protected		yes	yes
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		PBT	PBT
Connection		0.3 m PUR cable with connector	2 m PUR cable
No. of wires × cross-section			3×0.14 mm²
Approval		cULus	cULus
Recommended connector		BKS-B/S 48	
Other cable lengths on request.			

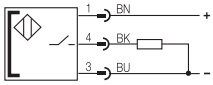
Wiring diagrams

NO

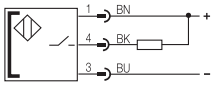
PNP/cable



PNP/connector

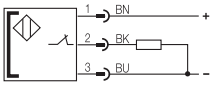


NPN/connector

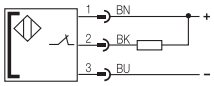


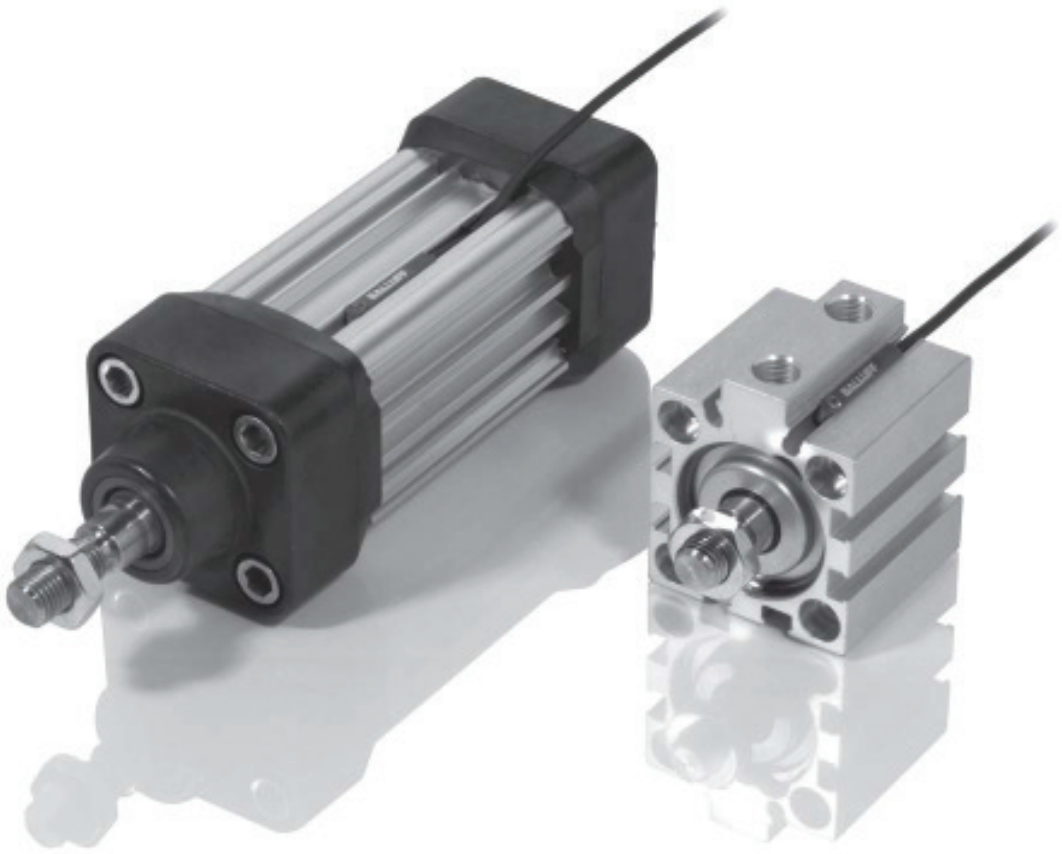
NC

PNP/connector



NPN/connector





3.1
Connectors selection guide
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Connectors ...
page 5.2 ...

Cable clip for routing on request

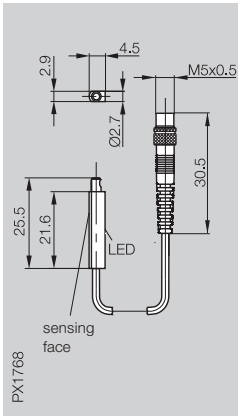
Hex Key Set

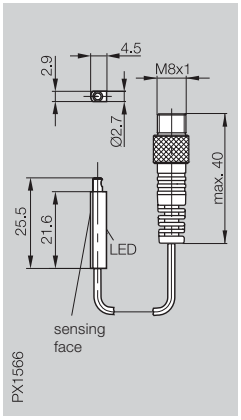
BMF Hex Key

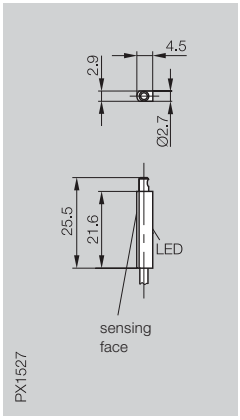
Please order accessories separately see page **5.**74

Series	**BMF 303**	**BMF 303**	**BMF 303**
Type	Connector M5×0.5 with rotatable union nut	Connector M8×1 with rotatable union nut	

The universal sensor for position monitoring on small grippers and cylinders.
A variety of mounting brackets enables adapting to virtually every miniaturized pneumatic actuator on the market.





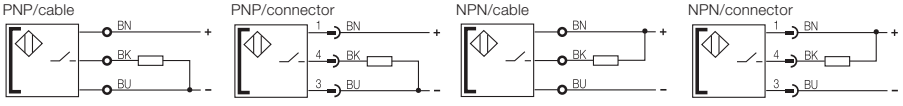


PNP	NO	BMF 303K-PS-C-2A-S26-00,3	BMF 303K-PS-C-2A-SA2-S49-00,3	BMF 303K-PS-C-2A-PU-02
	NC		BMF 303K-PO-C-2A-SA2-S49-00,3	BMF 303K-PO-C-2A-PU-02
NPN	NO	BMF 303K-NS-C-2A-S26-00,3	BMF 303K-NS-C-2A-SA2-S49-00,3	BMF 303K-NS-C-2A-PU-02
	NC		BMF 303K-NO-C-2A-SA2-S49-00,3	BMF 303K-NO-C-2A-PU-02
Rated operating field strength l H_n l		1.2 kA/m	1.2 kA/m	1.2 kA/m
Assured operating field strength l H_a l		≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m
Hysteresis of l H_n l		≤ 45 %	≤ 45 %	≤ 45 %
Temperature drift of turn-on point of l H_n l		≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C
Turn-on delay		≤ 0.07 ms	≤ 0.07 ms	≤ 0.07 ms
Turn-off delay		≤ 0.07 ms	≤ 0.07 ms	≤ 0.07 ms
Supply voltage U_B		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d		≤ 2 V	≤ 2 V	≤ 2 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operational current I_e		100 mA	100 mA	100 mA
No-load supply current I_0 max.		≤ 5 mA	≤ 5 mA	≤ 5 mA
Polarity reversal protected		yes	yes	yes
Short circuit protected		yes	yes	yes
Ambient temperature range T_a		–25...+70 °C	–25...+70 °C	–25...+70 °C
Utilization category		DC 13	DC 13	DC 13
Degree of protection per IEC 60529		IP 67	IP 67	IP 67
Housing material		LCP	LCP	LCP
Connection		0.3 m cable (PUR) with connector	0.3 m cable (PUR) with connector	2 m Cable PUR
No. of wires × cross-section				3×0.10 mm²
Approval		cULus	cULus	cULus
Recommended connector		BKS-_ 25	BKS-_ 48	

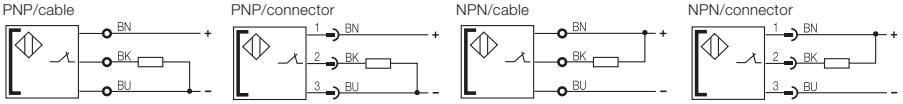
Other cable lengths on request.

Wiring diagrams

NO



NC



Please order accessories separately see page **5.**74

Advantages

Sensor disappears in the slot!

Switchpoint can be adjusted in seconds! Turn screw one revolution, adjust position, tighten.

Switchpoint cannot be lost. Even if you replace the sensor, the adjusted switchpoint is determined by the mounting bracket, not the sensor.

BMF 303-HW-28/30

BMF 303-HW-33

For hose clamp matrix see page **3.0.**10.

Ordering code	Advantages	Cylinder type	Mounting brackets
BMF 303-HW-28		C-slot e.g. SMC	
BMF 303-HW-30		C-slot e.g. Festo slot-10	
BMF 303-HW-31		C-slot e.g. Festo	
BMF 303-HW-33		T-slot e.g. Festo slot-8, Bosch, SMC	
BMF 303-HW-40		T-slot e.g. Festo slot-8, Bosch, SMC	
BMF 303-HW-44		Trapezoidal slot 60°/90° e.g. Festo, Bosch, Numatics, Hoerbiger-Origa, Norgren-Martonair	
BMF 303-HW-51		T-slot **A** T-slot **B** Location for T-slot **A** Location for T-slot **B**	
BMF 303-HW-59		without slot round cylinder Ø 8...80 mm with hose clamp	
BMF 303-HW-80		e.g. Bosch	

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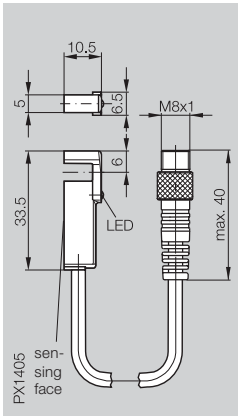
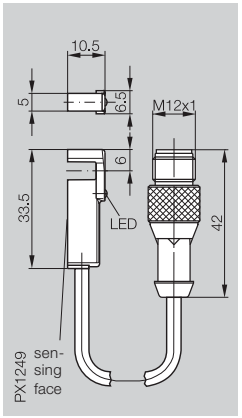
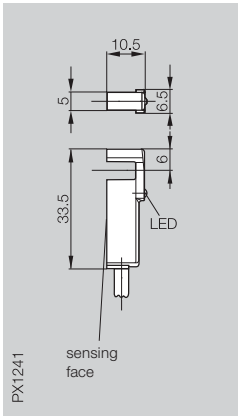
5 Connectors ... page 5.2 ...

Series		**BMF 305**	**BMF 305**	**BMF 305**	
Type		Connector M8×1 with rotatable union nut	Connector M12×1 with rotatable union nut		

The all-rounder for position monitoring on cylinders.



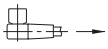




PNP	NO	BMF 305K-PS-C-2-SA2-S49-00,3	BMF 305K-PS-C-2-S4-00,2	BMF 305K-PS-C-2-PU-02	
	NC	BMF 305K-PO-C-2-SA2-S49-00,3		BMF 305K-PO-C-2-PU-02	
NPN	NO	BMF 305K-NS-C-2-SA2-S49-00,3		BMF 305K-NS-C-2-PU-02	
	NC	BMF 305K-NO-C-2-SA2-S49-00,3		BMF 305K-NO-C-2-PU-02	
Rated operating field strength I H_n I		1.2 kA/m	1.2 kA/m	1.2 kA/m	
Assured operating field strength I H_a I		≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m	
Hysteresis of I H_n I		≤ 45 %	≤ 45 %	≤ 45 %	
Temperature drift of turn-on point of I H_n I		≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	
Turn-on delay		≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	
Turn-off delay		≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	
Supply voltage U_B		10...30 V DC	10...30 V DC	10...30 V DC	
Voltage drop U_d		≤ 3.1 V	≤ 3.1 V	≤ 3.1 V	
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC	
Rated operational current I_e		200 mA*	200 mA*	200 mA*	
No-load supply current I_0 max.		≤ 30 mA	≤ 30 mA	≤ 30 mA	
Polarity reversal protected		yes	yes	yes	
Short circuit protected		yes	yes	yes	
Ambient temperature range T_a		–25...+85 °C	–25...+85 °C	–25...+85 °C	
Utilization category		DC 13	DC 13	DC 13	
Degree of protection per IEC 60529		IP 67	IP 67	IP 67	
Housing material		LCP	LCP	LCP	
Connection		0.3 m cable (PUR) with connector	0.2 m cable (PUR) with connector	2 m Cable PUR	
No. of wires × cross-section				3×0.14 mm²	
Approval		cULus	cULus	cULus	
Recommended connector		BKS-_ 48	BKS-_ 19		

*Temperature load curve see page **3.0.**6

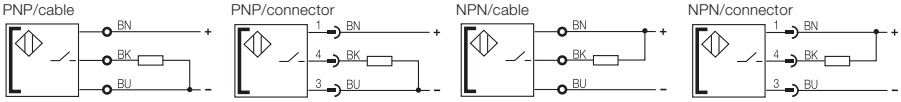
Other cable lengths on request.



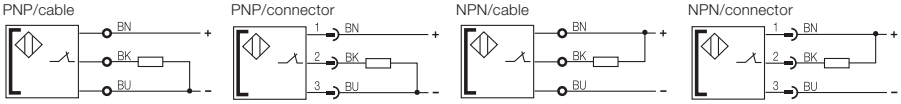
Connector orientation

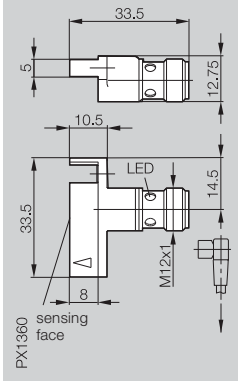
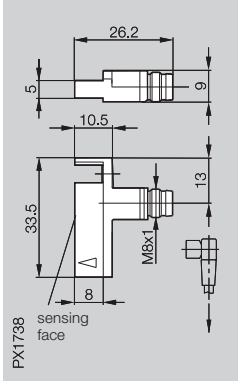
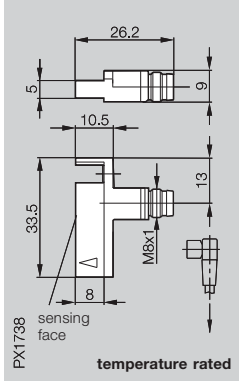
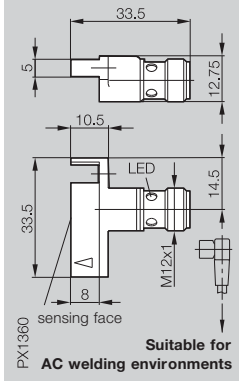
Wiring diagrams

NO



NC



	BMF 305	BMF 305	BMF 305	BMF 305	
					
	BMF 305M-PS-C-2-S4	BMF 305M-PS-C-2-S49	BMF 305M-PS-C-2-SA4-S49	BMF 305M-PS-**W**-2-S4	
	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	
	≤ 45 %	≤ 45 %	≤ 45 %	≤ 45 %	
	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 3 %/°C	≤ 0.3 %/°C	
	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	
	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	
	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	≤ 4 V	
	75 V DC	75 V DC	75 V DC	75 V DC	
	200 mA*	200 mA*	200 mA*	200 mA*	
	≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA	
	yes	yes	yes	yes	
	yes	yes	yes	yes	
	–25...+85 °C	–25...+85 °C	**–25...+105 °C**	–25...+85 °C	
	DC 13	DC 13	DC 13	DC 13	
	IP 67	IP 67	IP 65	IP 67	
	AI	AI	AI	AI	
	Connector	Connector	Connector	Connector	
	cULus	cULus	cULus	cULus	
	BKS-_ 19/BKS-_ 20	BKS-_ 48/BKS-_ 49	BKS-S146-00	BKS-_ 19/BKS-_ 20	
					

3.1
Connectors selection guide
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Connectors ...
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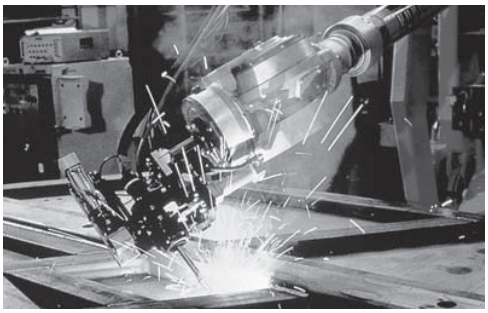
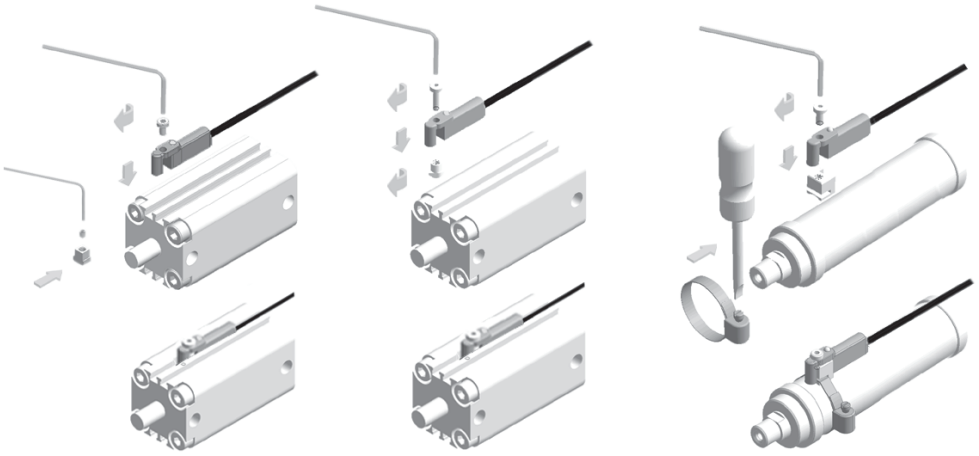
The series BMF 305M/315M/32M-..-**W**-.. is suitable for extreme conditions of use. The housings are metal, making them resistant to weld splatter. Conditions including weld currents of over 25 kA do not affect the function ability of the sensor. The output state of the sensor is stored during AC welding.



BMF 305-HW-20 BMF 305-HW-23 BMF 305-HW-24

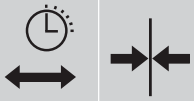
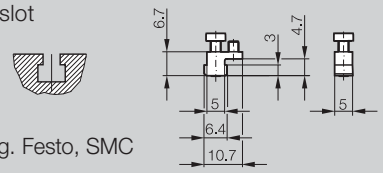
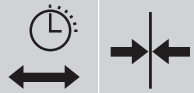
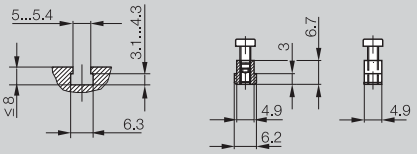
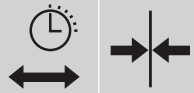
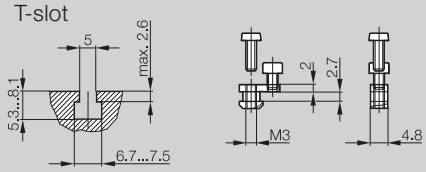
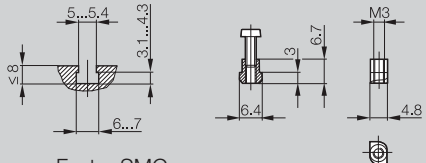
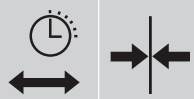
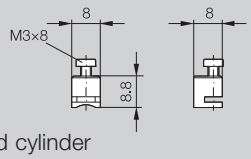


Advantages

Can be inserted in slot from above. Anytime! Also afterwards! Fast! Saves time!

Switchpoint can be adjusted in seconds! Turn screw one revolution, adjust position, tighten.

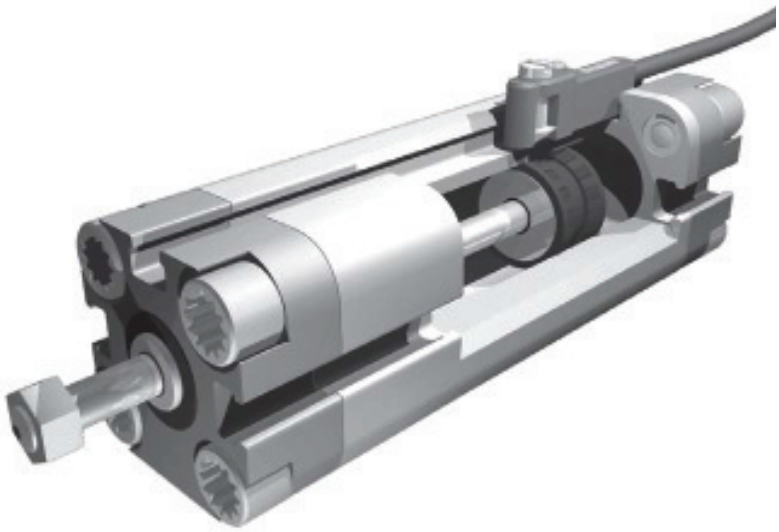
Switchpoint cannot be lost. Even if you replace the sensor, the adjusted switchpoint is determined by the mounting bracket, not the sensor.

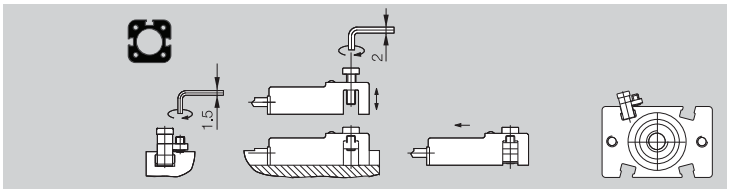
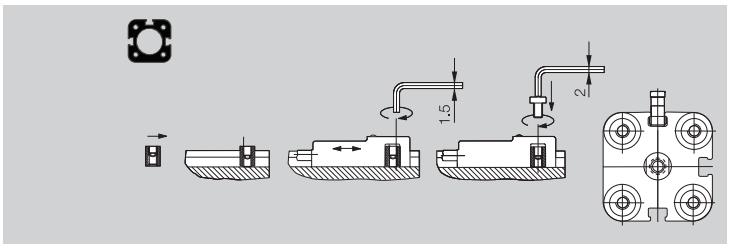
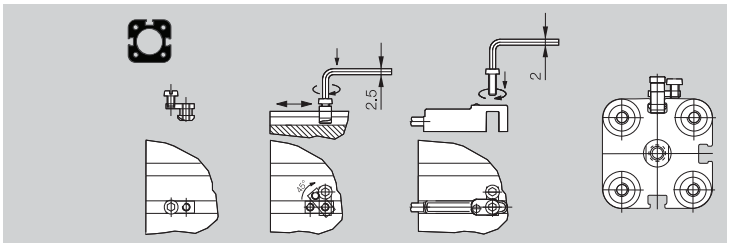
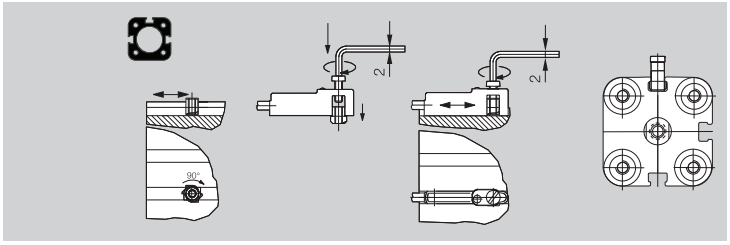
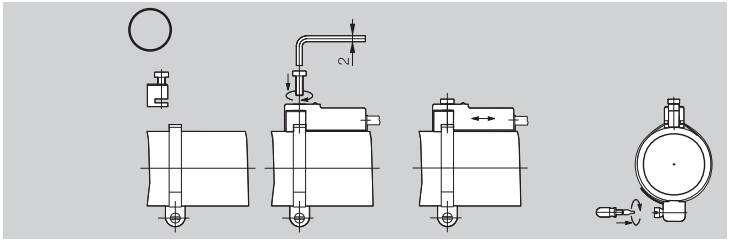
Ordering code	Advantages	Cylinder type	Mounting brackets
BMF 305-HW-17 		T-slot  PX1207a e.g. Festo, SMC	
BMF 305-HW-20 		T-slot  PX1287b e.g. Festo, SMC	
BMF 305-HW-22 	 	T-slot  PX1305 e.g. Festo, Bosch	
BMF 305-HW-23 	 	T-slot  PX1306 e.g. Festo, SMC	
BMF 305-HW-24 		without slot  PX1341 round cylinder with piston Ø < 8...80 mm	

Hex Key Set

BMF Hex Key

Please order accessories separately see page **5.**74



	Installation notes	Included
	1. Insert mounting bracket in slot from front side 2. Insert sensor from above and tighten 3. Position sensor, bolt together mounting bracket	Set screw DIN 916 M3×5-A2 Screw DIN 7984 M3×10-A2 Mounting bracket
	1. Insert mounting bracket into slot from head end 2. Insert sensor from above, position and tighten mounting bracket 3. Bolt together sensor with mounting bracket	Set screw DIN 916 M3×4-A2 Screw ISO 1207 M3×6-A2 Mounting bracket also: Screw DIN 7984 M3×6-A2
	1. Insert mounting bracket from above into slot Rotate 90° 2. Insert sensor from above and tighten 3. Position sensor, bolt together mounting bracket	Screw DIN 912 M3×4-A2 Screw DIN 7984 M3×8-A2 Mounting bracket also: Screw ISO 1207 M3×4-A2 Screw ISO 1207 M3×8-A2
	1. Attach mounting bracket to sensor with 1 to 2 turns 2. Insert sensor and mounting bracket from above and tighten (mounting bracket turns also 90°)	Screw DIN 7984-KL M3×10-A2 Mounting bracket also: Screw ISO 1207-KL M3×10-A2
	1. Place tube cuff on loosely 2. Attach sensor with mounting bracket to tube cuff 3. Position and tighten	Screw DIN 7984 M3×8-A2 Mounting bracket For hose clamp matrix see page **3.0.**10 (please order separately)

3.1

5

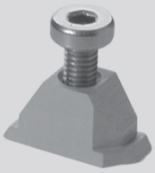
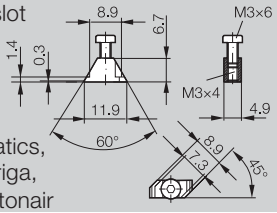
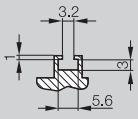
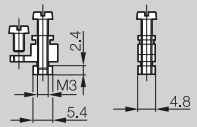
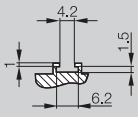
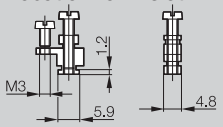
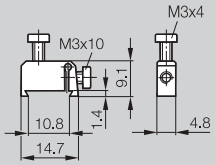
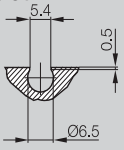
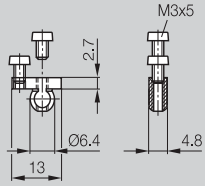
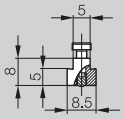
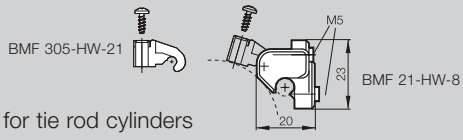
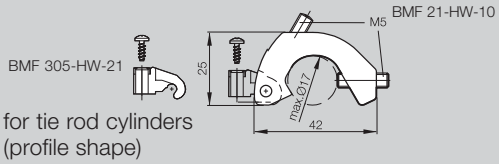
Connectors ... page 5.2 ...

Advantages

Can be installed in the slot from above.
Anytime!
Also afterwards!
Fast!
Saves time!

Switchpoint can be adjusted in seconds! Turn screw one revolution, adjust position, tighten.

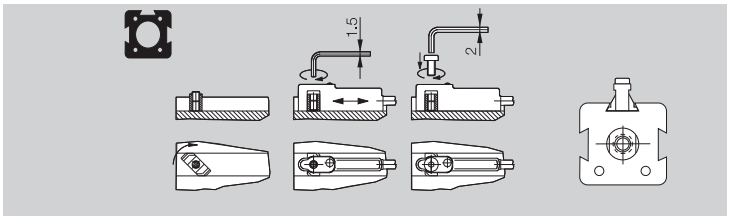
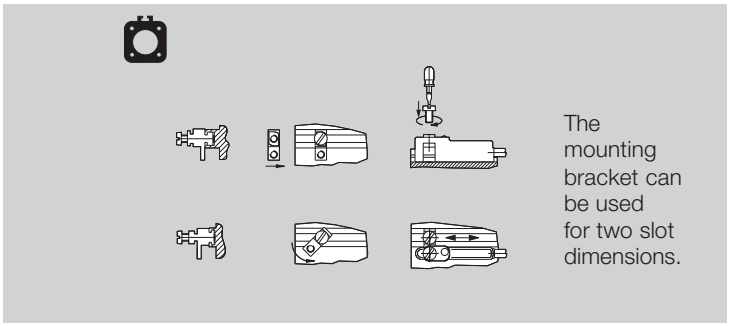
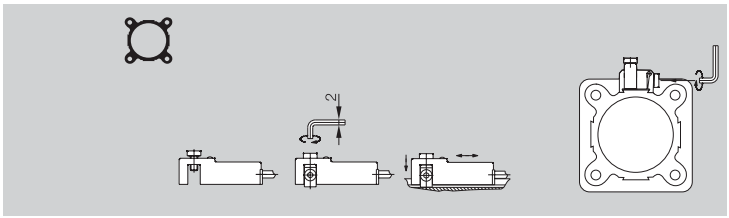
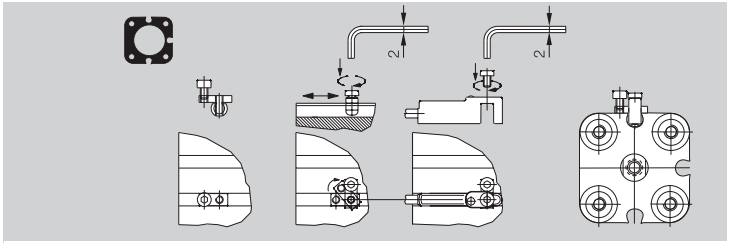
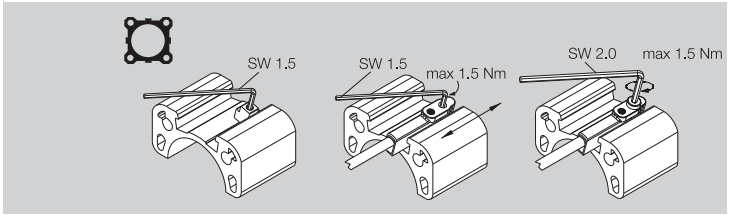
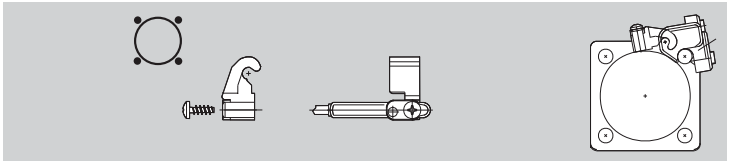
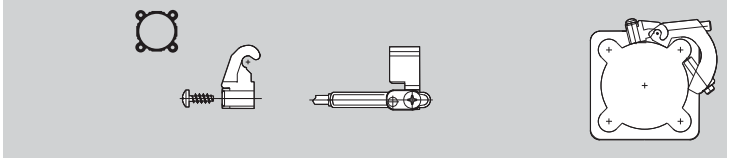
Switchpoint cannot be lost. Even if you replace the sensor, the adjusted switchpoint is determined by the mounting bracket, not the sensor.

Ordering code	Advantages	Cylinder type	Mounting brackets
BMF 305-HW-25 	  	Trapezoidal slot 60°/90°  e.g. Festo, Bosch, Numatics, Hoerbiger-Origa, Norgren-Martonair  PX1343	
BMF 305-HW-26 	  	T-slot **A**  Location for T-slot **A**  T-slot **B**  Location for T-slot **B**  e.g. SMC PX1419	
BMF 305-HW-27 	  	Trapezoidal guide  e.g. Bosch  PX1501	
BMF 305-HW-32 	  	C-slot   e.g. Norgren PX1537	
BMF 305-HW-64 	  	   e.g. Bosch PX1900	
BMF 305-HW-21 and BMF 21-HW-8 		 for tie rod cylinders PX1302d	
BMF 305-HW-21 and BMF 21-HW-10 		 for tie rod cylinders (profile shape) PX1302c	

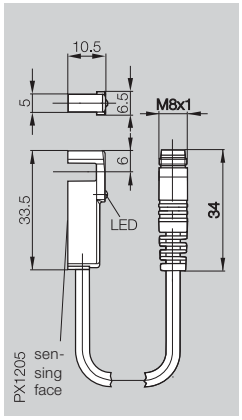
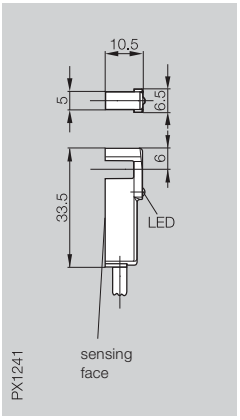
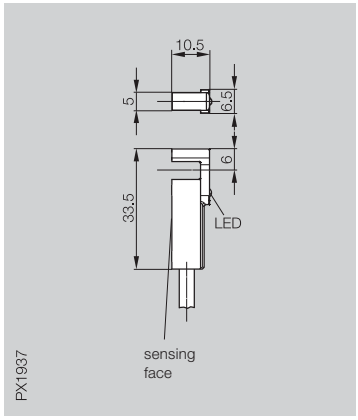

Hex Key Set


BMF Hex Key

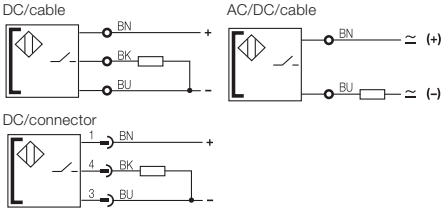
Please order accessories separately see page **5.**74

	Installation notes	Included
	1. Insert mounting bracket from above and rotate 90° 2. Insert sensor, position, tighten mounting bracket 3. Screw sensor to mounting bracket	Set screw DIN 916 M3×4-A2 Screw DIN 7984 M3×6-A2 Mounting bracket
	T-slot **A**: insert mounting bracket, insert sensor from above, position and tighten both screws. T-slot **B**: insert mounting bracket from above and rotate 90°. Insert sensor from above, position and tighten both screws.	Cheese head screw ISO 1207 M3×5 A2 Cheese head screw ISO 1207 M3×14 A2 Mounting bracket
	1. Insert mounting bracket from above 2. Insert sensor from above and tighten 3. Position sensor, tighten mounting bracket	Screw DIN 912 M3×4-A2 Screw DIN 7984 M3×10-A2 Mounting bracket
	1. Insert mounting bracket from above and rotate 90° 2. Insert sensor, position, tighten mounting bracket 3. Screw sensor to mounting bracket	Screws DIN 7984 M3×5-A2 Mounting bracket
	1. Mounting bracket in slot from above 2. Insert sensor from above, position and tighten mounting bracket 3. Bolt together sensor with mounting bracket	Cheese head screw DIN 7984 M3×5-A2, Threaded stud DIN 914 M3×4-A2 Angled screwdriver 1.5 mm blade Angled screwdriver 2.0 mm blade
	BMF 305-HW-21 used with BMF 21-HW-8 for attaching to a tie rod cylinder	PT-Screw KBL 30x8-A2 Mounting bracket BMF 305-HW-21 (Mounting bracket BMF 21-HW-8 please order separately)
	BMF 305-HW-21 used with BMF 21-HW-10 for attaching to a profile cylinder	PT-Screw KBL 30x8-A2 Mounting bracket BMF 305-HW-21 (Mounting bracket BMF 21-HW-10 please order separately)

All-rounder Reed BMF 305

Series	BMF 305	BMF 305	BMF 305
				
DC NO, PNP	BMF 305K-R-PS-F-3-S49-00,2	BMF 305K-R-PS-F-3-03	
AC NO / DC NO polarized			BMF 305K-R-US-L-3-03
Sensed medium	Magnetic field	Magnetic field	Magnetic field
Turn-on delay	≤ 0.7 ms	≤ 0.7 ms	≤ 0.7 ms
Turn-off delay	≤ 0.2 ms	≤ 0.2 ms	≤ 0.2 ms
Supply voltage U_B	10...30 V DC	10...30 V DC	6...240 V AC/DC
Switching capacity max. reed contact	10 W	10 W	10 W
Rated operational current I_e	500 mA	500 mA	128 mA at 24 V AC/DC 86 mA at 115 V AC/DC 43 mA at 230 V AC/DC
Minimum operating current I_m			3 mA
Polarity reversal protected	no	no	no
Short circuit protected	no	no	no
Ambient temperature range T_a	–20...+70 °C	–20...+70 °C	–20...+70 °C
Utilization category	DC 13	DC 13	AC 12/DC 12
Degree of protection per IEC 60529	IP 65	IP 65	IP 65
Housing material	LCP	LCP	LCP
Connection	0.2 m cable (PUR) with connector	3 m cable, PVC	3 m cable, PVC
No. of wires × cross-section		3×0.14 mm²	2×0.18 mm²
Approval			cULus
Recommended connector	BKS-_ 48		
			

Wiring diagrams



The **reed switches BMF 305K-R-...** have an LED for function indication and as a setup aid. The recovery diode for switching an inductive load is already integrated.
For sensing the piston position in pneumatic cylinders you can choose between electronic and mechanical cylinder switches.
Select whichever one fits your application.

We'll be glad to help you.

- Fast and easy to install
- Fits any standard cylinder size using available mounting brackets
- No loss of the switchpoint when replacing a switch

When using reed switches you should verify functionality on the pneumatic cylinder by means of pre-testing.

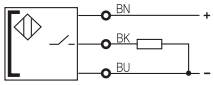
Advantages

- Non-contact, wear-free sensing of the piston position
- Desensitized to contamination
- Senses piston position through the cylinder wall
- Can be installed in T-slot cylinder without mounting bracket
  e.g. Festo: ADVU, ADN, DRQ, DGP; SMC; Bosch.

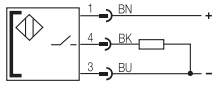
Wiring diagrams

NO

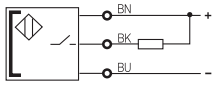
PNP/cable



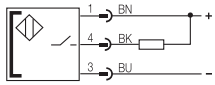
PNP/connector



NPN/cable

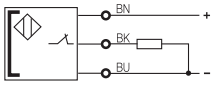


NPN/connector

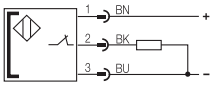


NC

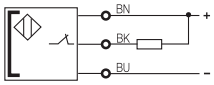
PNP/cable



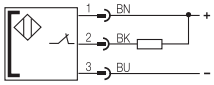
PNP/connector



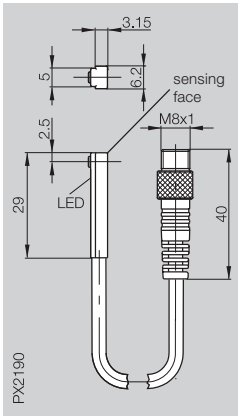
NPN/cable

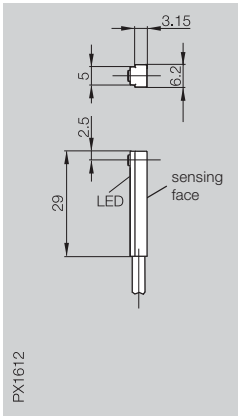


NPN/connector



Series	BMF 307	BMF 307
Type	Connector M8×1 with rotatable union nut	





PNP	NO	BMF 307K-PS-C-2-SA2-S49-00,3	BMF 307K-PS-C-2-PU-02
	NC	BMF 307K-PO-C-2-SA2-S49-00,3	BMF 307K-PO-C-2-PU-02
NPN	NO	BMF 307K-NS-C-2-SA2-S49-00,3	BMF 307K-NS-C-2-PU-02
	NC	BMF 307K-NO-C-2-SA2-S49-00,3	BMF 307K-NO-C-2-PU-02

Rated operating field strength | H_n |	1.2 kA/m	1.2 kA/m
Assured operating field strength | H_a |	≥ 2 kA/m	≥ 2 kA/m
Hysteresis of | H_n |	≤ 45 %	≤ 45 %
Temperature drift of turn-on point of | H_n |	≤ 0.3 %/°C	≤ 0.3 %/°C
Turn-on delay	≤ 0.05 ms	≤ 0.05 ms
Turn-off delay	≤ 0.05 ms	≤ 0.05 ms
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
Polarity reversal protected	yes	yes
Short circuit protected	yes	yes
Ambient temperature range T_a	–25...+85 °C	–25...+85 °C
Utilization category	DC 13	DC 13
Degree of protection per IEC 60529	IP 67	IP 67
Housing material	LCP	LCP
Connection	0.3 m cable (PUR) with connector	2 m Cable PUR
No. of wires × cross-section		3×0.14 mm²
Approval	cULus	cULus
Recommended connector	BKS-_ 48	

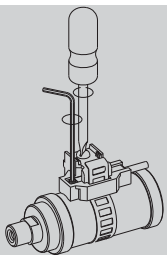
*Temperature load curve see page **3.0.**6

Other cable lengths on request.

3.1
Connectors selection guide page 3.0.7 ...

5
Connectors ... page 5.2 ...

Mounting brackets
BMF 307-HW-73-115/
BMF 307-HW-73 -255
page **3.1.**16



Cable clip for routing on request

Hex Key Set

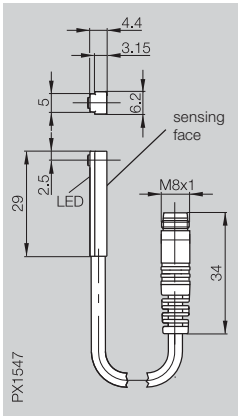
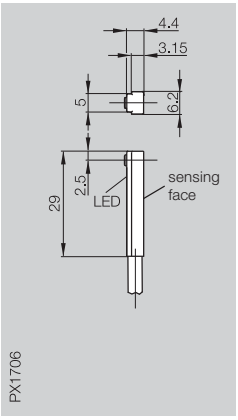
BMF Hex Key

Please order accessories separately see page **5.**74

Compact Reed BMF 307

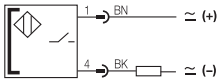
The **reed switches BMF 307K-R-...** have an LED for function indication and as a setup aid. The recovery diode for switching an inductive load is already integrated.
For sensing the piston position in pneumatic cylinders you can choose between electronic and mechanical cylinder switches.
Select whichever one fits your application.
We'll be glad to help you.

Can be installed in T-slot cylinder without mounting bracket e.g. Festo: ADVU, ADN, DRQ, DGP; SMC; Bosch.
When using reed switches you should verify functionality on the pneumatic cylinder by means of pre-testing.

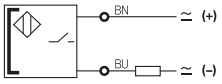
Series	**BMF 307**	**BMF 307**
		
AC NO / DC NO polarized	BMF 307K-R-AS-L-3-S49-00,2	BMF 307K-R-AS-L-3-03
Sensed medium	Magnetic field	Magnetic field
Turn-on delay	≤ 0.7 ms	≤ 0.7 ms
Turn-off delay	≤ 0.2 ms	≤ 0.2 ms
Supply voltage U_B	4...30 V AC/DC	4...30 V AC/DC
Switching capacity max. reed contact	10 W	10 W
Rated operational current I_e	128 mA at 24 V AC/DC	128 mA at 24 V AC/DC
Minimum operating current I_m	3 mA	3 mA
Polarity reversal protected	no	no
Short circuit protected	no	no
Ambient temperature range T_a	–20...+70 °C	–20...+70 °C
Utilization category	AC 12/DC 12	AC 12/DC 12
Degree of protection per IEC 60529	IP 65	IP 65
Housing material	LCP	LCP
Connection	0.2 m cable (PUR) with connector	3 m cable, PVC
No. of wires × cross-section		2×0.14 mm²
Recommended connector	BKS-_ 48	
		

Wiring diagrams

Connector example BKS-_48-1-_ _



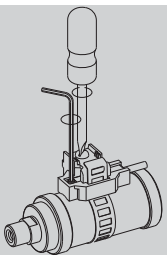
Cable

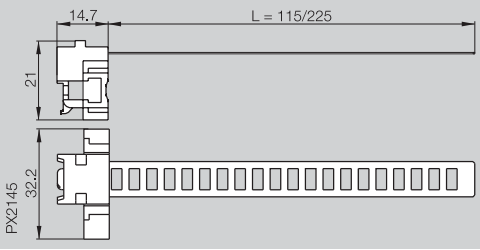


Connect to ground on controller side!

BMF 307-HW-73 -115
BMF 307-HW-73 -255
"Well saddled!
BMT T-slot sensors on round cylinders!"
Mounting brackets suitable for BMF 307 and BMF 315

Piston ∅	Mounting bracket
8...25	BMF 307-HW-73-115
25...63	BMF 307-HW-73-255





BMF 315K – the first choice for pneumatic cylinders with T-slot

The T-slot has established itself over the past years as the standard for pneumatic cylinders.

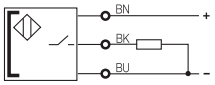
Advantages

- Can be installed in the T-slot from above
- Proven electronics from the BMF line of sensors
- Rugged, compact, low-profile housing
- Extremely reliable switching response
- High function reserve

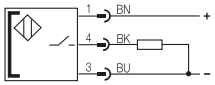
Wiring diagrams

NO

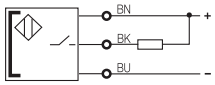
PNP/cable



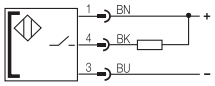
PNP/connector



NPN/cable

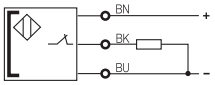


NPN/connector

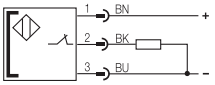


NC

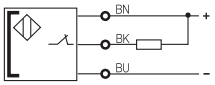
PNP/cable



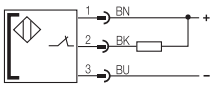
PNP/connector



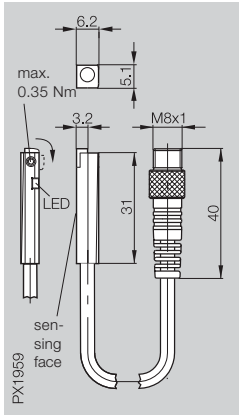
NPN/cable

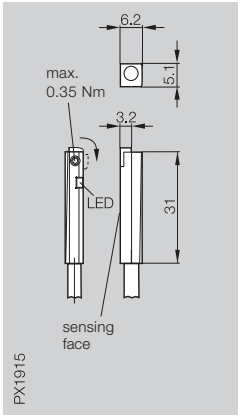


NPN/connector



Series	BMF 315K	BMF 315K
Type	Connector M8×1 with rotatable union nut	





PNP	NO	BMF 315K-PS-C-2-SA2-S49-00,2	BMF 315K-PS-C-2-PU-02
	NC	BMF 315K-PO-C-2-SA2-S49-00,2	BMF 315K-PO-C-2-PU-02
NPN	NO	BMF 315K-NS-C-2-SA2-S49-00,2	BMF 315K-NS-C-2-PU-02
	NC	BMF 315K-NO-C-2-SA2-S49-00,2	BMF 315K-NO-C-2-PU-02

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
Turn-on delay	≤ 0.05 ms	≤ 0.05 ms
Turn-off delay	≤ 0.05 ms	≤ 0.05 ms
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.	≤ 15 mA	≤ 15 mA
Polarity reversal protected	yes	yes
Short circuit protected	yes	yes
Ambient temperature range T_a	–25...+85 °C	–25...+85 °C
Utilization category	DC 13	DC 13
Degree of protection per IEC 60529	IP 67	IP 67
Housing material	PA 66	PA 66
Connection	0.2 m cable (PUR) with connector	2 m Cable PUR
No. of wires × cross-section		3×0.14 mm²
Approval	cULus	cULus
Recommended connector	BKS-_ 48	

*Temperature load curve see page **3.0.**6

Other cable lengths on request.

Cable clip for routing on request

Hex Key Set

BMF Hex Key

Please order accessories separately see page **5.**74

3.1
Connectors selection guide page 3.0.7 ...

5
Connectors ... page 5.2 ...

BMF 307-HW-73 -115
BMF 307-HW-73 -255
Mounting brackets suitable for BMF 307 and BMF 315

Special

BMF 315M – the first choice for pneumatic cylinders with T-slot

The T-slot has now become established as the standard slot type for pneumatic cylinders.

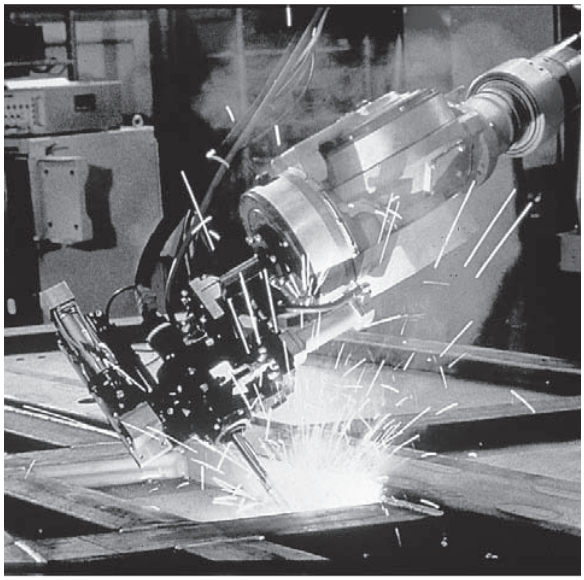
To shorten assembly time, the ability to install from above is increasingly demanded.

The BMF 315M meets every requirement and stands out with its reliable switching characteristics and functional reserve.

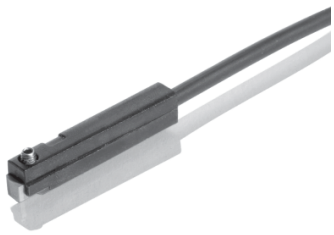
For especially demanding applications you can choose from between **weld-immune** or **temperature rated** versions.

Advantages

- Proven electronics from the BMF line of sensors
- Can be installed in the T-slot from above
- Rugged, compact, low-profile housing
- Aluminum housing
- Extremely reliable switching behavior



Series	
Type	



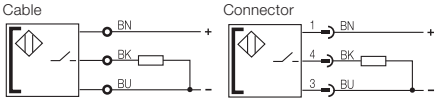
PNP	NO
Rated operating field strength I H_n I	
Assured operating field strength I H_a I	
Noise field strength max.	
Noise field frequency	
Hysteresis of I H_n I	
Temperature drift of turn-on point of I H_n I	
Turn-on delay	
Turn-off delay	
Supply voltage U_B	
Voltage drop U_d	
Rated insulation voltage U_i	
Rated operational current I_e	
No-load supply current I_0 max.	
Polarity reversal protected	
Short circuit protected	
Ambient temperature range T_a	
Utilization category	
Degree of protection per IEC 60529	
Housing material	
Connection	
No. of wires × cross-section	
Approval	
Recommended connector	

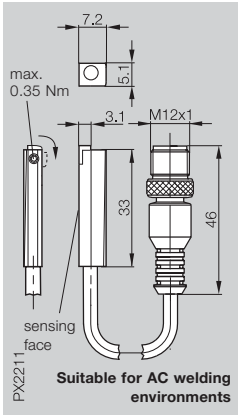
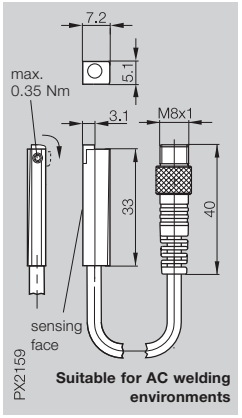
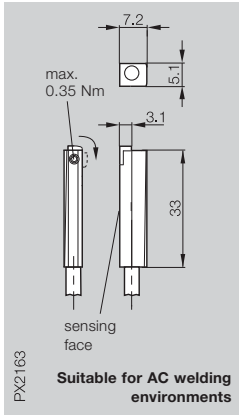
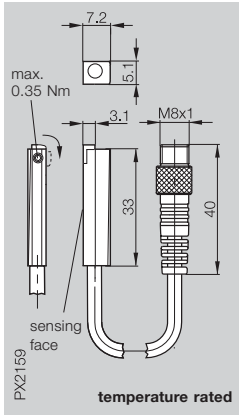
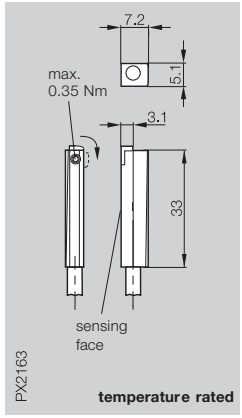
*Temperature load curve see page **3.0.**6

Other cable lengths on request.

Wiring diagrams

NO



	BMF 315M Connector M12×1 with rotatable union nut	BMF 315M Connector M8×1 with rotatable union nut	BMF 315M	BMF 315M Connector M8×1 with rotatable union nut	BMF 315M
					
	BMF 315M-PS-**W**-2-S04-00,3	BMF 315M-PS-**W**-2-S49-00,3	BMF 315M-PS-**W**-2-PU-02	BMF 315M-PS-D-2-SA3-S49-00,3	BMF 315M-PS-D-2-SA3-PU-02
	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
	200 kA/m	200 kA/m	200 kA/m		
	50...60 Hz	50...60 Hz	50...60 Hz		
	≤ 45 %	≤ 45 %	≤ 45 %	≤ 45 %	≤ 45 %
	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C
	≤ 50 ms	≤ 50 ms	≤ 50 ms	≤ 0.05 ms	≤ 0.05 ms
	≤ 50 ms	≤ 50 ms	≤ 50 ms	≤ 0.05 ms	≤ 0.05 ms
	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
	≤ 4 V	≤ 4 V	≤ 4 V	≤ 3.1 V	≤ 3.1 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*
	≤ 20 mA	≤ 20 mA	≤ 20 mA	≤ 15 mA	≤ 15 mA
	yes	yes	yes	yes	yes
	yes	yes	yes	yes	yes
	–25...+85 °C	–25...+85 °C	–25...+85 °C	**–25...+105 °C**	**–25...+105 °C**
	DC 13	DC 13	DC 13	DC 13	DC 13
	IP 67	IP 67	IP 67	IP 67	IP 67
	Al	Al	Al	Al	Al
	0.3 m cable (PUR) with connector	0.3 m cable (PUR) with connector	2 m Cable PUR	0.3 m cable (PUR) with connector	2 m Cable PUR
			3×0.1 mm²		3×0.1 mm²
	cULus	cULus	cULus	cULus	cULus
	BKS-_ 19	BKS-_ 48		BKS-_ 48	
					

3.1
Connectors selection guide page 3.0.7 ...
5
Connectors ... page 5.2 ...

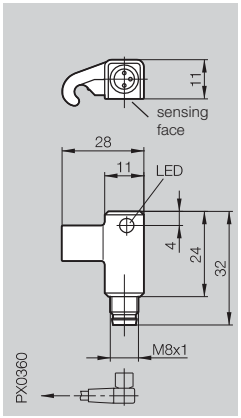

Cable clip for routing on request

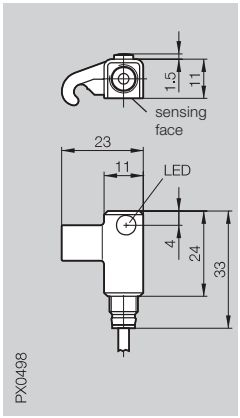

Hex Key Set
BMF Hex Key

Please order accessories separately see page **5.**74

BMF 21 are the classics for cylinders with tie rod, DUO rail, round cylinders and profile cylinders.

Reliable,
tough,
universal..





Series	BMF 21	BMF 21
PNP NO	BMF 21K-PS-C-2-S49	BMF 21K-PS-C-2-PU-02
NPN NO	BMF 21K-NS-C-2-S49	BMF 21K-NS-C-2-PU-02
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
Turn-on delay	≤ 0.05 ms	≤ 0.05 ms
Turn-off delay	≤ 0.05 ms	≤ 0.05 ms
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
Polarity reversal protected	yes	yes
Short circuit protected	yes	yes
Ambient temperature range T_a	–25...+85 °C	–25...+85 °C
Utilization category	DC 13	DC 13
Degree of protection per IEC 60529	IP 67	IP 67
Housing material	PBT (fiberglass reinforced)	PBT (fiberglass reinforced)
Connection	Connector	2 m Cable PUR
No. of wires × cross-section		3×0.14 mm²
Approval	cULus	
Recommended connector	BKS-_ 48/BKS-_ 49	

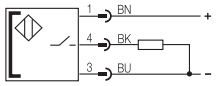
*Temperature load curve see page **3.0.**6

Other cable lengths on request.

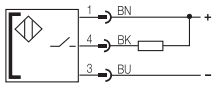
→ Connector orientation

Wiring diagrams

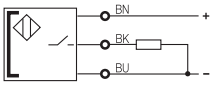
PNP/connector



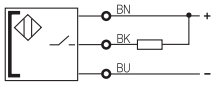
NPN/connector

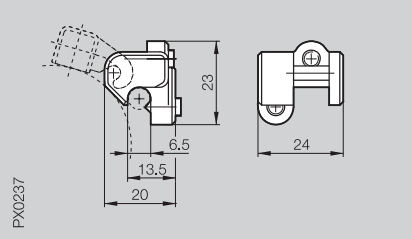


PNP/cable



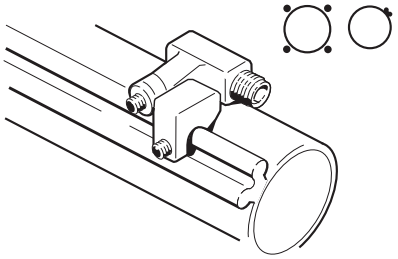
NPN/cable

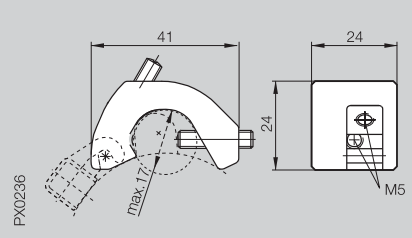




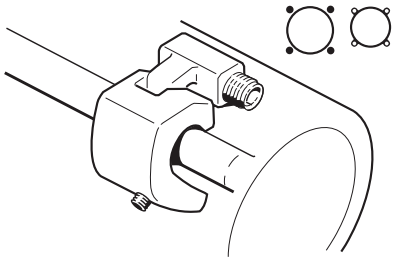
BMF 21-HW-8
for pneumatic cylinders with tie rod;
piston diameter any
tie rod diameter up to 6.5 mm

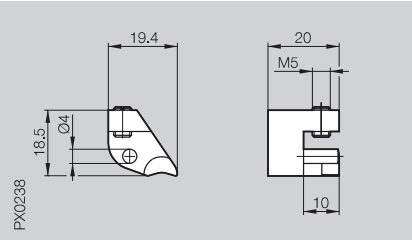
Pneumatic cylinders with DUO rail (Festo), piston diameter any



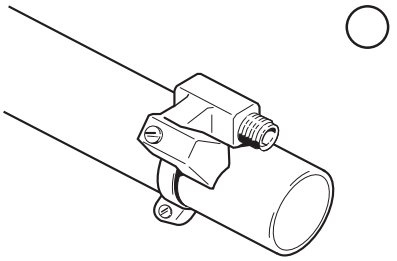


BMF 21-HW-10/BMF 21-HW-10-E
for pneumatic cylinders with tie rod;
piston diameter any Tie rod diameter to 17 mm for pneumatic cylinders with integrated tie rod (Profile)
Any piston diameter
Profile width up to 17 mm
BMF 21-HW-10-E:
Stainless steel 1.4305





BMF 21-HW-11
for pneumatic cylinders without tie rod/rail
Piston diameter 8...80 mm
Mounting bracket only usable with tube cuffs.



For hose clamp matrix
see page **3.0.**10.

Hex Key Set

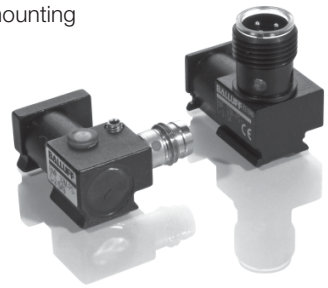
BMF Hex Key

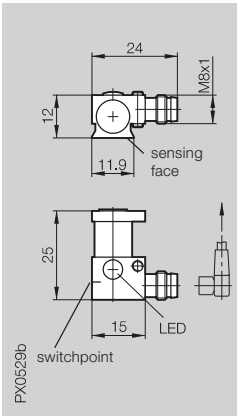
Please order accessories separately
see page **5.**74

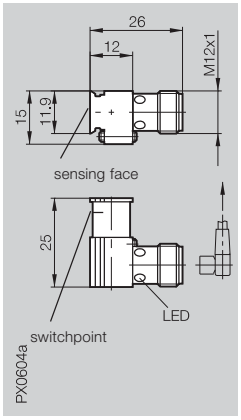
5
Connectors ...
page 5.2 ...

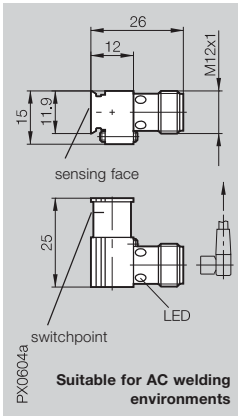
Series	BMF 32	BMF 32	BMF 32

BMF 32 – the specialist for round cylinders as well as cylinders with trapezoidal slot. Also for universal use with many cylinder types using suitable mounting brackets.









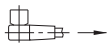
PNP	NO	BMF 32M-PS-C-2-S49	BMF 32M-PS-C-2-S4	BMF 32M-PS-**W**-2-S4
NPN	NO	BMF 32M-NS-C-2-S49	BMF 32M-NS-C-2-S4	
Rated operating field strength $\|H_n\|$		1.2 kA/m	1.2 kA/m	1.2 kA/m
Assured operating field strength $\|H_a\|$		≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m
Hysteresis of $\|H_n\|$		≤ 45 %	≤ 45 %	≤ 45 %
Temperature drift of turn-on point of $\|H_n\|$		≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C
Turn-on delay		≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms
Turn-off delay		≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms
Supply voltage U_B		10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop U_d		≤ 3.1 V	≤ 3.1 V	≤ 4 V
Rated insulation voltage U_i		75 V DC	75 V DC	75 V DC
Rated operational current I_e		200 mA*	200 mA*	200 mA*
No-load supply current I_0 max.		≤ 30 mA	≤ 30 mA	≤ 30 mA
Polarity reversal protected		yes	yes	yes
Short circuit protected		yes	yes	yes
Ambient temperature range T_a		–25...+85 °C	–25...+85 °C	–25...+85 °C
Utilization category		DC 13	DC 13	DC 13
Degree of protection per IEC 60529		IP 67	IP 67	IP 67
Housing material		Al	Al	Al
Connection		Connector	Connector	Connector
Approval		cULus	cULus	cULus
Recommended connector		BKS-_ 48/BKS-_ 49	BKS-_ 19/BKS-_ 20	BKS-_ 19/BKS-_ 20

*Temperature load curve see page **3.0.**6

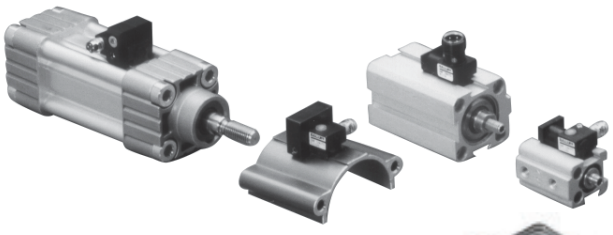
without mounting bracket

Cylinder with T-slot/ Trapezoidal slot

without mounting bracket for installation in cylinders with 60°- or 90°-trapezoidal slot e.g. Festo, Bosch, Martonair

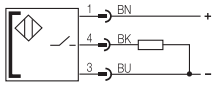


Connector orientation

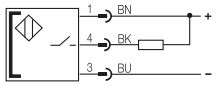


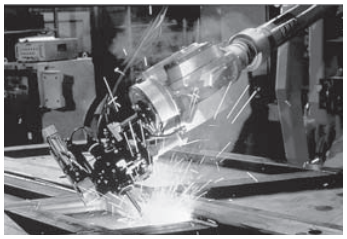
Wiring diagrams

PNP/connector



NPN/connector



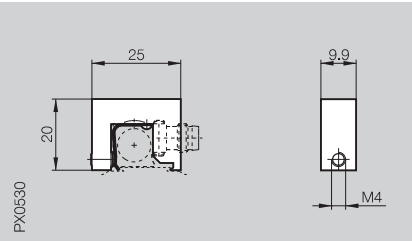


The series BMF 305M/315M/32M-..-**W**-.. is suitable for extreme conditions of use. The housings are metal, making them resistant to weld splatter. Conditions including weld currents of over 25 kA do not affect the function ability of the sensor. The output state of the sensor is stored during AC welding.

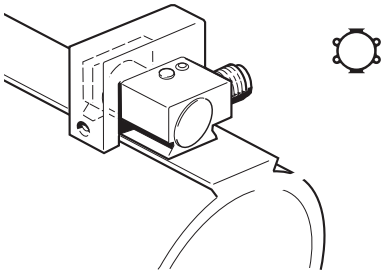
Hex Key Set

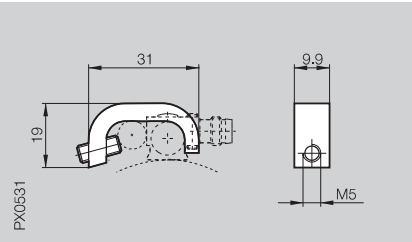
BMF Hex Key

Please order accessories separately see page **5.**74

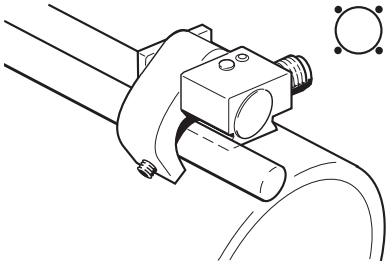


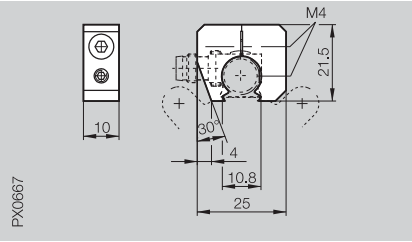
BMF 32-HW-12
for pneumatic cylinders with trapezoidal rail (Bosch Rexroth) any piston diameter



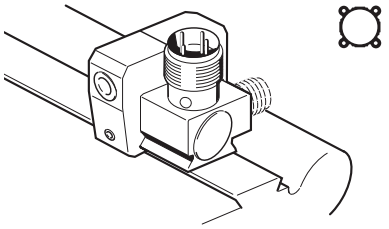


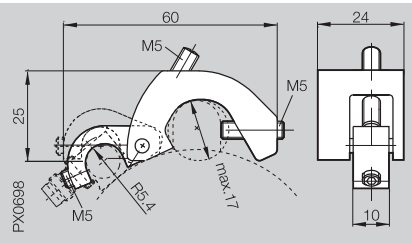
BMF 32-HW-13
for pneumatic cylinders with tie rod, any piston diameter
tie rod diameter max. 11 mm



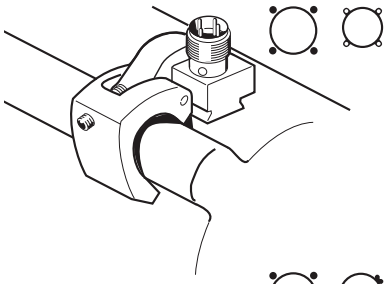


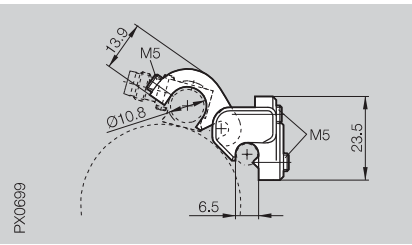
BMF 32-HW-14
for pneumatic cylinders with trapezoidal rail (Bosch) Typ:
0 822 350/351/352/353/354/355
any piston diameter





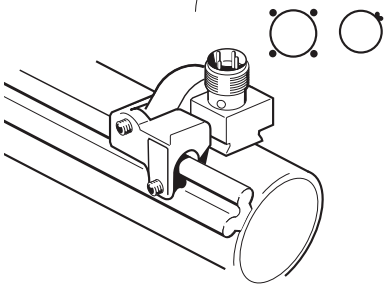
BMF 32-HW-15
for pneumatic cylinders with tie rod, any piston diameter
tie rod diameter up to 17 mm
for pneumatic cylinders with tie rod integrated in housing
any piston diameter
profile width up to 17 mm

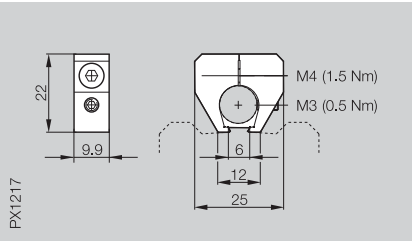




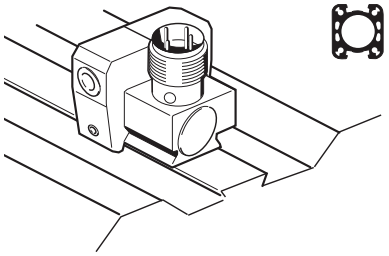
BMF 32-HW-16
for pneumatic cylinders with tie rod, any piston diameter
tie rod diameter up to 6.5 mm

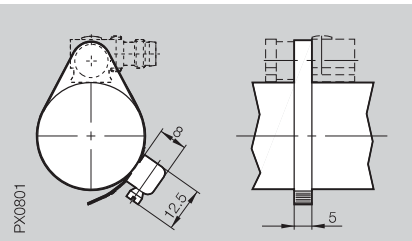
Pneumatic cylinders with DUO rail (Festo), piston diameter any





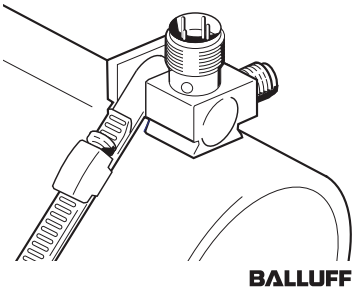
BMF 32-HW-18
for pneumatic cylinders with trapezoidal rail Bosch Rexroth Series 2700





BMF hose clamp size 0...8
stainless steel for pneumatic cylinders without tie rod/rail piston diameter up to 80 mm

For hose clamp matrix see page **3.0.**10.



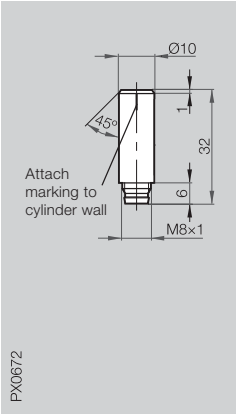
3.1
Connectors selection guide
page 3.0.7 ...

5
Connectors ...
page 5.2 ...

Special for the foods industry

BMF 10E – developed for the stricter demands of the foods industry.
Extremely tough thanks to single-part stainless steel housing.

Series	**BMF 10E**
Housing size	Ø 10 mm

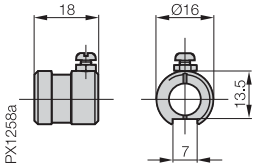


stainless steel

PNP NO	BMF 10E-PS-D-2-SA1-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
Turn-on delay	≤ 0.05 ms
Turn-off delay	≤ 0.05 ms
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
Polarity reversal protected	yes
Short circuit protected	yes
Ambient temperature range T_a	–40...+85 °C
Utilization category	DC 13
Degree of protection per IEC 60529	IP 67
Housing material	**Stainless steel 1.4571**
Connection	Connector
Recommended connector	BKS-_ 48/BKS-_ 49

*Temperature load curve see page **3.0.**6

Mounting bracket
BMF 10E-HW-19
Stainless steel 1.4571
(please order separately)

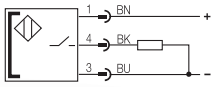


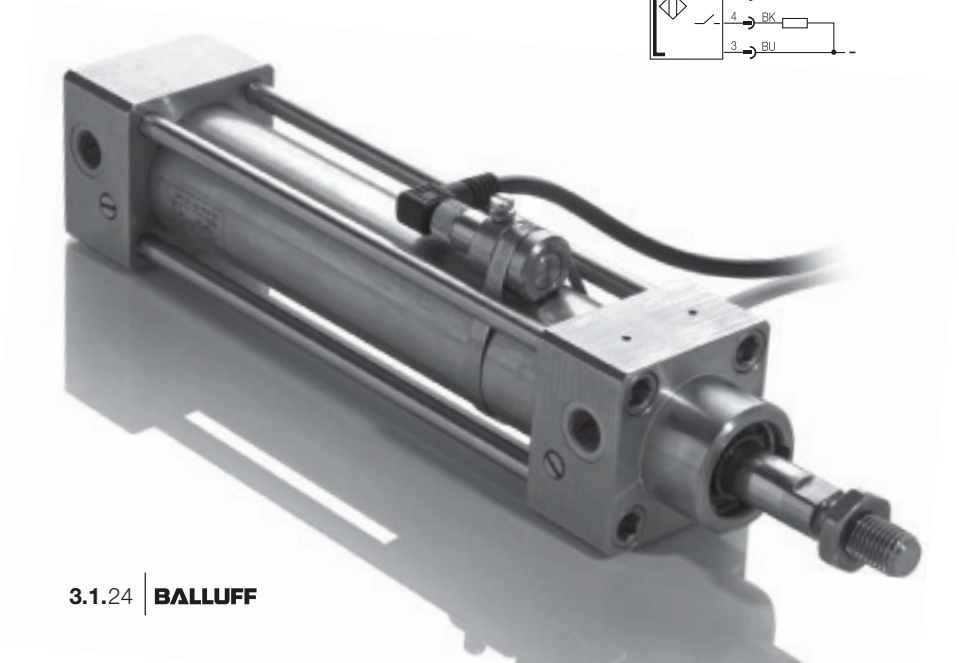
Usable only with hose clamp
(please order separately)

For hose clamp matrix see page **3.0.**10.

Wiring diagram

PNP/connector

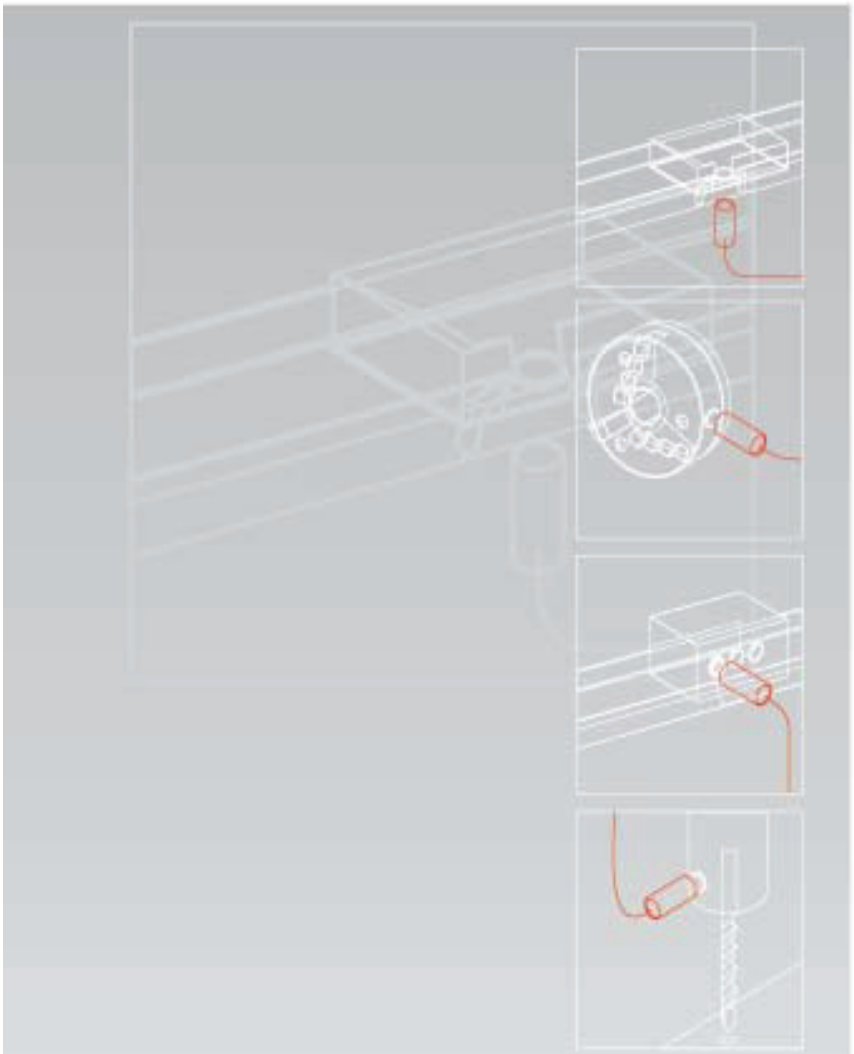




Hex Key Set

BMF Hex Key

Please order accessories separately see page **5.**74

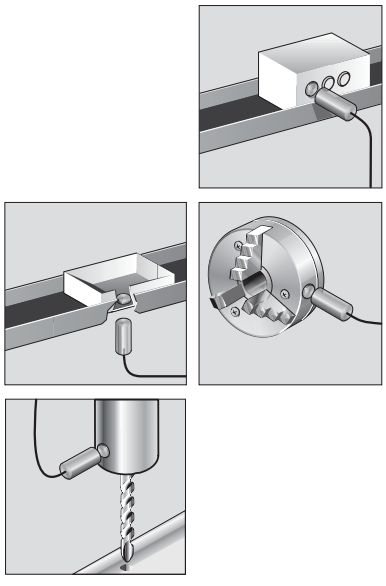


Magnetic Field Sensors

Magnetic field sensors are used mainly for position sensing, even through walls of non-magnetizable materials (aluminum, brass and non-magnetic stainless steels). Very long switching distances in a small package can be achieved through proper selection of the magnets.

Magnetic field sensors in the classic tubular housings of an inductive sensor offer several application advantages.

- Significantly longer switching distances compared with inductive sensors of the same size
- Senses through alloy or aluminum walls with no switching distance reduction
- Front or side actuation possible
- Magnet can be flush mounted in steel
- Responds to north or south pole
- Solid state, wear-free
- Insensitive to vibration
- Output protected against inductive spikes

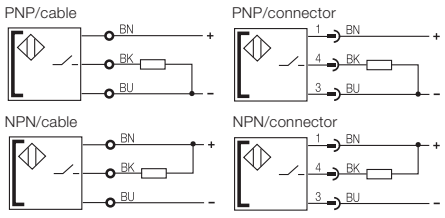


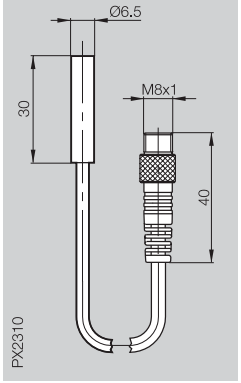
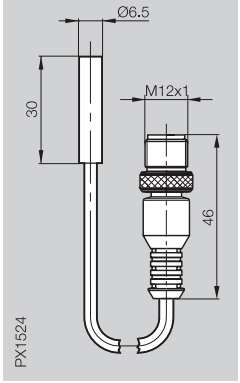
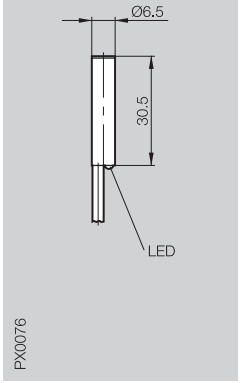
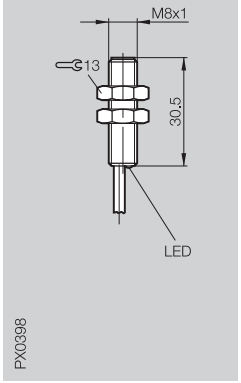
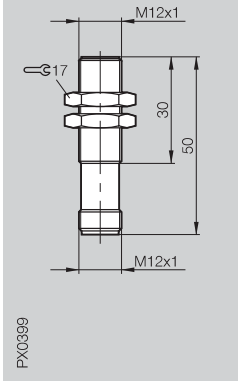
Series		
Type		
PNP	NO	
NPN	NO	
Rated operating field strength I H_n I		
Assured operating field strength I H_a I		
Hysteresis of I H_n I		
Temperature drift of turn-on point of I H_n I		
Turn-on delay		
Turn-off delay		
Supply voltage U_B		
Voltage drop U_d		
Rated insulation voltage U_i		
Rated operational current I_e		
No-load supply current I_0 max.		
Polarity reversal protected		
Short circuit protected		
Ambient temperature range T_a		
Utilization category		
Degree of protection per IEC 60529		
Housing material		
Connection		
No. of wires × cross-section		
Approval		
Recommended connector		

*Temperature load curve see page **3.0.**6

Other cable lengths on request.

Wiring diagrams



	BMF 07M Connector M8×1 with rotatable union nut	BMF 07M Connector M12×1 with rotatable union nut	BMF 07M	BMF 08M	BMF 12M
					
	BMF 07M-PS-D-2-SA2-S49-00,3	BMF 07M-PS-D-2-S4-00,6	BMF 07M-PS-C-2-KPU -02	BMF 08M-PS-C-2-KPU -02	BMF 12M-PS-D-2-S4
	BMF 07M-NS-D-2-SA2-S49-00,3		BMF 07M-NS-C-2-KPU -02	BMF 08M-NS-C-2-KPU -02	BMF 12M-NS-D-2-S4
	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
	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms
	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms
	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	≤ 3.1 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
	yes	yes	yes	yes	yes
	yes	yes	yes	yes	yes
	–25...+85 °C	–25...+85 °C	–25...+85 °C	–25...+85 °C	–25...+85 °C
	DC 13	DC 13	DC 13	DC 13	DC 13
	IP 67	IP 67	IP 67	IP 67	IP 67
	CuZn coated	CuZn coated	CuZn coated	CuZn coated	CuZn coated
	0.3 m cable (PUR) with connector	0.6 m cable (PUR) with connector	2 m Cable PUR	2 m Cable PUR	Connector
			3×0.14 mm²	3×0.14 mm²	
	cULus	cULus	cULus	cULus	cULus
	BKS-_ 48	BKS-_ 19			BKS-_ 19/BKS-_ 20

Operating distance magnet sensor

Magnet type	Samarium cobalt	Hard ferrite	Strontium ferrite
			
Ordering code	620260	620961	709084
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

Assured switching is given from 0 mm to the operating distance indicated in the table. The given switching distances are determined from series measurements and should be considered a starting point for selecting a suitable magnet.

3.2

5
Connectors, holders ... page 5.2 ...