

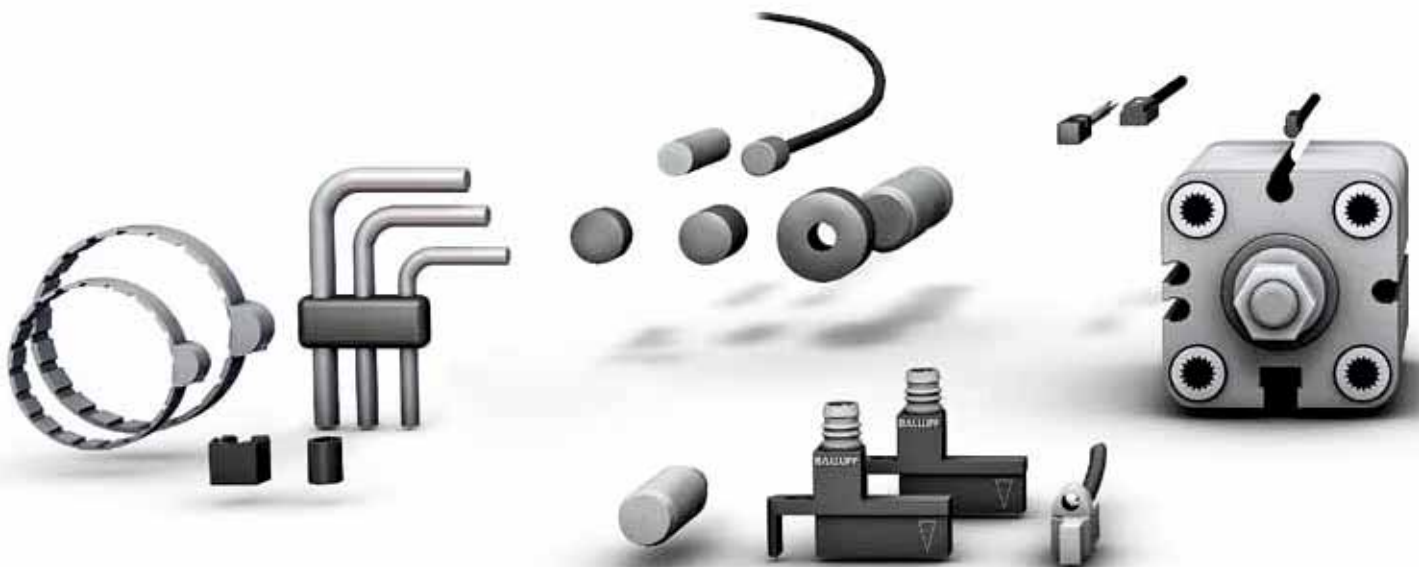


# Magnetic Cylinder Sensors

## Magnetic cylinder sensors for object detection

The primary application for magnetic sensors is scanning piston positions on pneumatic and hydraulic cylinders.

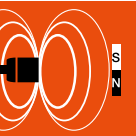
- Can be used universally
- Very precise, reliable switching behavior
- Long service life due to lack of contact and wear
- Vibration-resistant
- Space-saving attachment thanks to small sizes



# Magnetic Cylinder Sensors

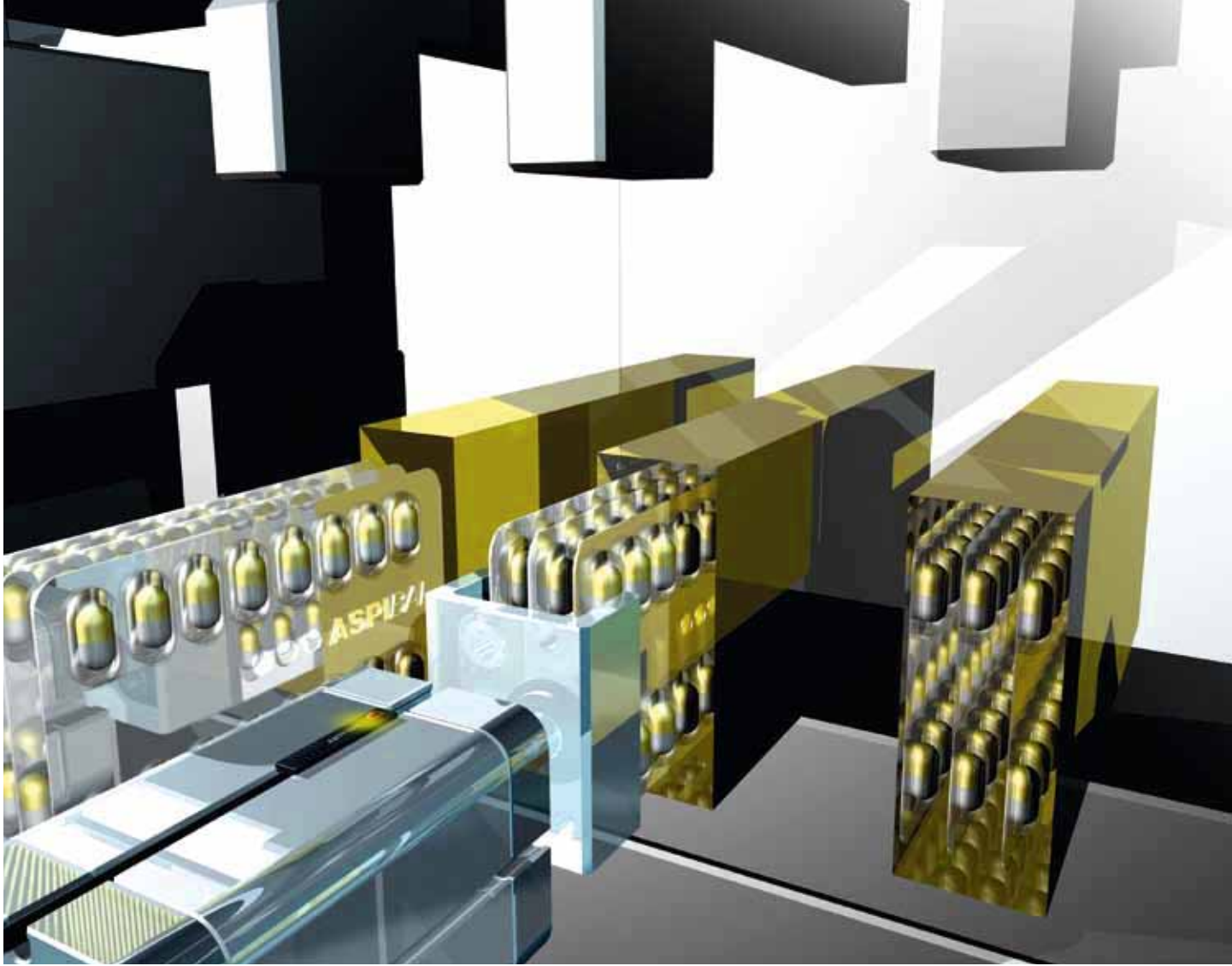
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Basic information and definitions can be found on **page 934**.





**Reliable and wear-free position detection on all pneumatic cylinders – Increase your machine's functional reliability and availability**

Magnetic cylinder sensors are used chiefly on cylinders and grippers for monitoring the piston position. The sensor detects the field of the magnet embedded in the piston through the actuator wall. Thanks to non-contacting position detection, magnetic and electronic cylinder sensors from Balluff function reliably and without wear, with no contact erosion, no bouncing, no sticking and just one switching point. The piston position is reliably detected even at high traverse speeds.



**Mini-sensors for mini-actuators – Better integration options**

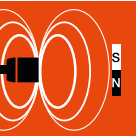
Balluff offers ideal solutions for short-stroke cylinders and mini-grippers. The mini cylinder switches from Balluff are among the smallest on the market and have a highly accurate switching point. The sensor achieves maximum precision, even over short switching distances!



**The right sensor for each cylinder—reduce costs: Universal use ensured with only a few different types**

Virtually any cylinder size and make can be covered with the small number of designs as well as fastening and mounting materials. A special sensor element enables Balluff sensors to be used on any cylinder from virtually any manufacturer.

# Sensors with mounting system or compact sensors – Which sensor is optimal for your application?



Magnetic Cylinder Sensors  
**Performance Spectrum**  
 Product Overview

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

	Sensors with mounting system	Compact sensors
Would you like to use just one sensor for a variety of cylinder types?	<input checked="" type="checkbox"/> <b>Reduce the number of types – one for all!</b>	<input type="checkbox"/>
Do you need to change out sensors quickly and easily?	<input checked="" type="checkbox"/> <b>Switching point remains the same</b>	<input type="checkbox"/>
Do you always use the same standard cylinder type (T- or C-slot)?	<input type="checkbox"/>	<input checked="" type="checkbox"/> <b>Simple to install, compact</b>

**Our standard sensors have a perfect mounting system:** Magnetic cylinder sensors BMF with our mounting system have a captive switching point and can be used universally.

**Compact sensors** with an integrated holding element feature compact design and ease of installation.

on page 824



on page 842



**Magnetic cylinder sensors with special properties**

on page 854

**Magnetic sensors for object detection**

on page 868

# Magnetic Cylinder Sensors

## Product overview

	Magnetic cylinder sensors with mounting System					Magnetic cylinder sensors with a compact design				
--	--	--	--	--	--	---	--	--	--	--



BMF series	103	303	305	21	32	204	214	243	235
Mini designs	■	■				■	■	■	■
Maxi designs			■	■	■				
Global series						■	■	■	■

Properties									
The connector variant			Page 857	Page 838	Page 857				
Cable with connector	page 827	Page 831	Page 835			Page 845	Page 847	Page 849	Page 851
Cable variant	page 827	Page 831	Page 835	Page 838		Page 845	Page 847	Page 849	Page 851
V-Twin available	page 827	Page 831	Page 835			Page 845	Page 847	Page 849	Page 851
Robust metal housing for the food industry			Page 857		Page 857				
Weld-immune electronics			Page 860		Page 860				
High-temperature resistant up to 105 °C			Page 862						
ATEX cylinder sensors									
Reed switches			Page 866						
Cylinder designs with a long range									
For analog distance measurement									

Cylinder profile									
	Size 10 slot (C-slot)	Festo, Sommer, Bosch	■	■			■		
	Rounded groove (C-slot)	SMC, Bimba, Schunk	■	■			■	■	
	T-slot	General	■	■	■				■
	Round cylinder	General		■	■	■	■		
	Trapezoidal slot	Bosch, Parker, Norgren		■	■		■		
	Trapezoidal guide	Bosch		■	■				
	C-slot, large	Numatics, Norgren		■	■				
	with rail/SMC slot A and slot B	SMC		■	■				
	Profile cylinder and tie rod 5...11 mm	General		■	■	■	■		■
	Profile cylinder and tie rod 9...15 mm	General		■	■	■	■		■
	Profile cylinder and tie rod 14...20 mm	General		■	■	■	■		■
	U-slot	SMC CP95		■					

# Magnetic Cylinder Sensors

## Product overview

**Magnetic sensors for object detection** **Magneto-inductive displacement sensors for analog position measurement**



<b>307</b>	<b>315</b>	<b>10E</b>	<b>255</b>	<b>Ø 6.5 mm</b>	<b>M8x1</b>	<b>M12x1</b>	<b>Micro-BIL</b>
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Page 853	Page 861			Page 870				Page 877
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Magnetic Cylinder Sensors  
Performance Spectrum  
**Product Overview**

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors



# Magnetic Cylinder Sensors

## Magnetic cylinder sensors with mounting system

With its standard sensors for grippers and pneumatic cylinders, Balluff provides a flexible solution for position detection: with standard sensors and the perfect mounting system.

Magnetic cylinder sensors with mounting system are suited for use on mini-grippers and in short-stroke cylinders (BMF 103), for miniaturized (BMF 303) as well as for larger actuators (BMF 305).

The switching point is set just once and remains intact, even when replacing the sensor. This way you increase the functional reliability of your equipment. Replacement is significantly easier and more secure even at difficult-to-access locations.

By selecting the right mounting brackets you can adapt these sensors to virtually all pneumatic cylinder types. A few all-purpose types reduce costs and save storage space.

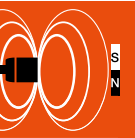


# Magnetic Cylinder Sensors with Mounting System

## Contents

### Magnetic Cylinder Sensors with Mounting System

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BMF 103 mounting bracket	828
BMF 303	830
BMF 303 mounting bracket	832
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BMF 305 mounting bracket	836
BMF 21	838
BMF 21 mounting bracket	839
Total Productive Maintenance (TPM)	840



Basic information  
and definitions  
can be found  
on **page 934**.





# Magnetic Cylinder Sensors with Mounting System

## BMF 103

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.



Model		
Properties		
PNP, NO	<b>Ordering code</b>	
	Part number	
PNP, NC	<b>Ordering code</b>	
	Part number	
NPN, NO	<b>Ordering code</b>	
	Part number	
Supply voltage $U_S$		
Voltage drop $U_d$		
Rated insulation voltage $U_e$		
Rated operating current $I_e$		
Polarity reversal protected/transposition protected/short-circuit protected		
Rated switching field strength $I_{H_n}$		
Assured switching field strength $I_{H_a}$		
Temperature drift of switch-on point of $I_{H_n}$		
Ambient temperature $T_a$		
On/off delay		
Degree of protection as per IEC 60529		
Approval		
Material	Housing	
Connection		

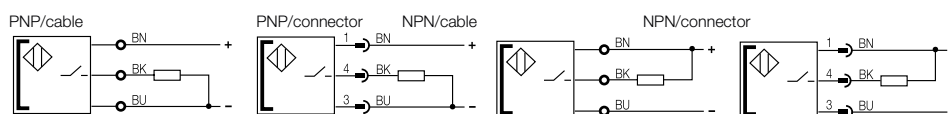
Basic information and definitions can be found on page 976, associated mounting brackets for BMF 103 can be found on page 828.

**Additional cable lengths on request.**

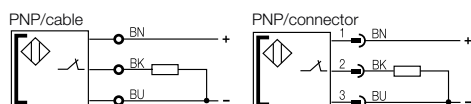


### Wiring diagrams

NO



NC

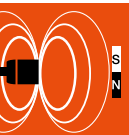


# Magnetic Cylinder Sensors with Mounting System

## BMF 103



BMF 103	BMF 103	BMF 103	BMF 103	BMF 103	BMF 103
Unrivaled short cylinder sensor with M5 connector	Unrivaled short cylinder sensor with M8 connector	Unrivaled short V-Twin variant with M8 connector	Unrivaled short cylinder sensor with M12 connector	Unrivaled short cylinder sensor with direct PUR cable	
<b>BMF001J</b>	<b>BMF001L</b>	<b>BMF001R</b>	<b>BMF001K</b>	<b>BMF001E</b>	
BMF 103K-PS-C-2A-S26-00,3	BMF 103K-PS-C-2A-SA2-S49-00,3	BMF 103K-PS-C-2A-SA95-S75-00,3	BMF 103K-PS-C-2A-S4-00,5	BMF 103K-PS-C-2A-PU-02	
	<b>BMF0015</b>			<b>BMF0013</b>	
	BMF 103K-PO-C-2A-SA2-S49-00,3			BMF 103K-PO-C-2A-PU-02	
	<b>BMF0011</b>			<b>BMF000Y</b>	
	BMF 103K-NS-C-2A-SA2-S49-00,3			BMF 103K-NS-C-2A-PU-02	
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	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC	
100 mA	100 mA	100 mA	100 mA	100 mA	
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	
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	
≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	
-25...+70 °C	-25...+70 °C	-25...+85 °C	-25...+85 °C	-25...+70 °C	
≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	
IP 67	IP 67	IP 67	IP 67	IP 67	
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	
LCP	LCP	LCP	LCP	LCP	
0.3 m PUR cable with M5 connector, 4-pin	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 4-pin	0.5 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3×0.1 mm <sup>2</sup>	



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

**BMF 103**  
BMF 303  
BMF 305  
BMF 21

Total Productive Maintenance

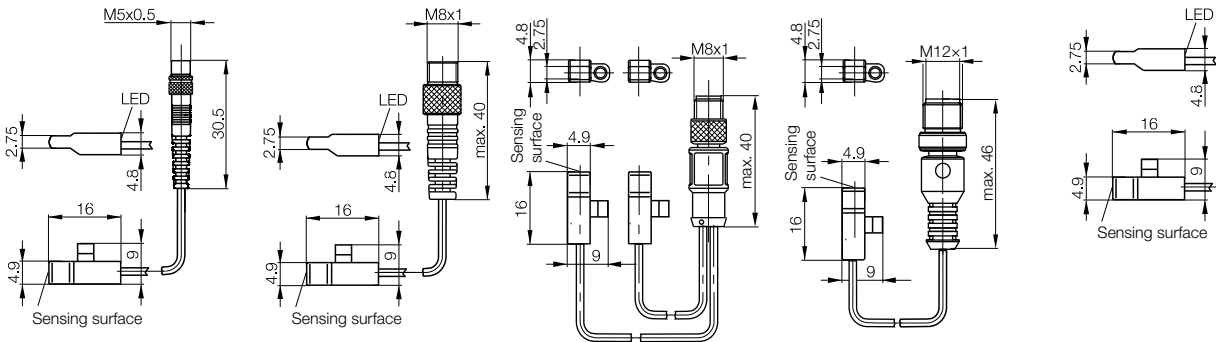
Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors



Suitable mounting brackets for BMF 103 can be found on **page 828**

# Magnetic Cylinder Sensors with Mounting System

## BMF 103 mounting bracket



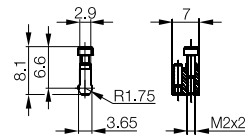
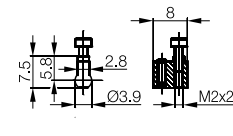
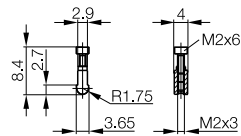
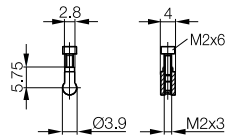
robust

robust

Mounting bracket for	<b>BMF 103</b>	<b>BMF 103</b>	<b>BMF 103</b>	<b>BMF 103</b>
Slot	Rounded groove (C-slot)	Size 10 slot (C-slot)	Rounded groove (C-slot)	Size 10 slot (C-slot)
<b>Ordering code</b>	<b>BAM00K8</b>	<b>BAM00K9</b>	<b>BAM00KN</b>	<b>BAM00KP</b>
Part number	BMF 103-HW-41	BMF 103-HW-42	BMF 103-HW-85	BMF 103-HW-87
Installation advantages				
Cylinder type, for example	SMC, Bimba, Schunk	Festo, Sommer, Bosch	SMC, Bimba, Schunk	Festo, Sommer, Bosch
Dimensions of cylinder slot				



Switching point adjusted in seconds! Open screw with one turn, adjust position, tighten.



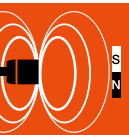
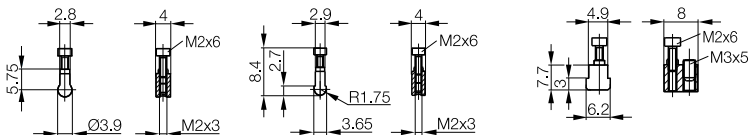
Switching point cannot be lost. Even if you replace the sensor, the adjusted switching point is permanently set by the mounting bracket.

# Magnetic Cylinder Sensors with Mounting System

## BMF 103 mounting bracket



with hollow bolt	with hollow bolt	with hollow bolt		
<b>BMF 103</b> Rounded groove (C-slot)	<b>BMF 103</b> Size 10 slot (C-slot)	<b>BMF 103</b> T-slot		
<b>BAM01K6</b> BMF 103-HW-100	<b>BAM01K7</b> BMF 103-HW-102	<b>BAM00KA</b> BMF 103-HW-43		
SMC, Bimba, Schunk	Festo, Sommer, Bosch	Festo, Bosch, SMC		



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System  
**BMF 103**  
 BMF 303  
 BMF 305  
 BMF 21  
 Total Productive Maintenance

Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

### Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.



# Magnetic Cylinder Sensors with Mounting System

## BMF 303

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.

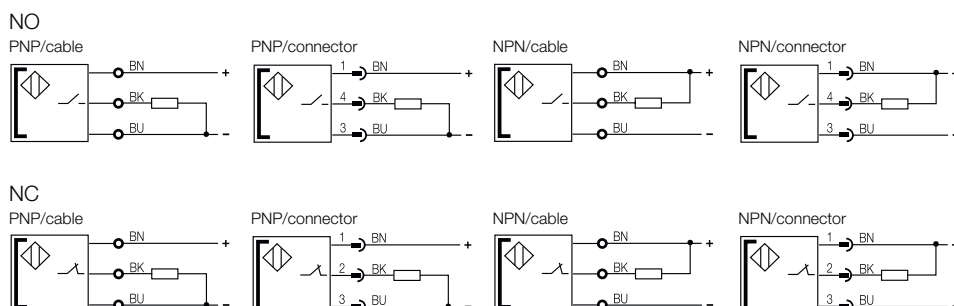


Model		
Properties		
PNP, NO	<b>Ordering code</b>	
	Part number	
PNP, normally closed	<b>Ordering code</b>	
	Part number	
NPN, NO	<b>Ordering code</b>	
	Part number	
NPN, NC	<b>Ordering code</b>	
	Part number	
Supply voltage $U_S$		
Voltage drop $U_d$		
Rated insulation voltage $U_i$		
Rated operating current $I_o$		
Polarity reversal protected/transposition protected/short-circuit protected		
Rated switching field strength $I H_n I$		
Assured switching field strength $I H_a I$		
Hysteresis of $I H_n I$		
Temperature drift of switch-on point of $I H_n I$		
On/off delay		
Ambient temperature $T_a$		
Degree of protection as per IEC 60529		
Approval		
Material	Housing	
Connection		

Basic information and definitions can be found on page 976, associated mounting brackets for BMF 303 can be found on page 832.

**Additional cable lengths on request.**

### Wiring diagrams



# Magnetic Cylinder Sensors with Mounting System

## BMF 303



Model	Description	Model	Description	Model	Description	Model	Description
<b>BMF 303</b>	Cylinder sensor for all common cylinders with M5 connector	<b>BMF 303</b>	Cylinder sensor for all common cylinders with M8 connector	<b>BMF 303</b>	V-Twin variant for all common cylinders with M8 connector	<b>BMF 303</b>	V-Twin variant for all common cylinders with M12 connector
<b>BMF003Z</b>	BMF 303K-PS-C-2A-S26-00,3	<b>BMF0043</b>	BMF 303K-PS-C-2A-SA2-S49-00,3	<b>BMF004F</b>	BMF 303K-PS-C-2A-SA95-S75-00,3	<b>BMF004E</b>	BMF 303K-PS-C-2A-SA95-S4-00,3
		<b>BMF0039</b>	BMF 303K-PO-C-2A-SA2-S49-00,3				
<b>BMF0033</b>	BMF 303K-NS-C-2A-S26-00,3	<b>BMF0034</b>	BMF 303K-NS-C-2A-SA2-S49-00,3				
		<b>BMF002Y</b>	BMF 303K-NO-C-2A-SA2-S49-00,3				
							<b>BMF003U</b>
							BMF 303K-PS-C-2A-PU-02
							<b>BMF0036</b>
							BMF 303K-PO-C-2A-PU-02
							<b>BMF0031</b>
							BMF 303K-NS-C-2A-PU-02
							<b>BMF002U</b>
							BMF 303K-NO-C-2A-PU-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 2 V	≤ 2 V	≤ 2 V	≤ 2 V	≤ 2 V	≤ 2 V	≤ 2 V	≤ 2 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA	100 mA	100 mA	100 mA	100 mA	100 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
1.2 kA/m	1.2 kA/m	1.2 kA/m	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	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m
≤ 45%	≤ 45%	≤ 45%	≤ 45%	≤ 45%	≤ 45%	≤ 45%	≤ 45%
≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C
≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
LCP	LCP	LCP	LCP	LCP	LCP	LCP	LCP
0.3 m PUR cable with M5 connector, 4-pin	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 4-pin	0.3 m PUR cable with M8 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3×0.1 mm <sup>2</sup>



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

BMF 103

**BMF 303**

BMF 305

BMF 21

Total Productive Maintenance

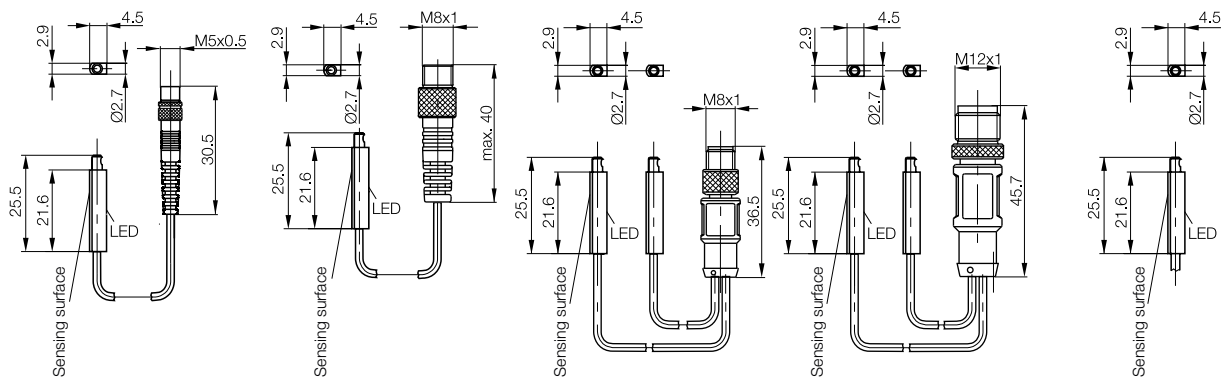
Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

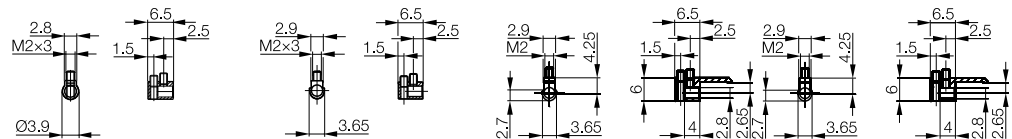


Suitable mounting brackets for BMF 303 can be found on **page 832**

# Magnetic Cylinder Sensors with Mounting System

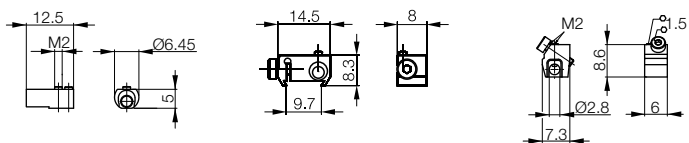
## BMF 303 mounting bracket

Mounting bracket for Slot	<b>BMF 303</b> Rounded groove (C-slot)	<b>BMF 303</b> Size 10 slot (C-slot)	<b>BMF 303</b> Rounded groove (C-slot)	<b>BMF 303</b> Size 10 slot (C-slot)	
<b>Ordering code</b>	<b>BAM00KZ</b>	<b>BAM00LO</b>	<b>BAM01FO</b>	<b>BAM00L1</b>	
Part number	BMF 303-HW-28	BMF 303-HW-30	BMF 303-HW-97	BMF 303-HW-31	
Installation advantages					
Cylinder type, for example	SMC, Bimba, Schunk	Festo, Sommer, Bosch	SMC, Bimba, Schunk	Festo, Sommer, Bosch	
Dimensions of cylinder slot					



Mounting bracket for Slot	<b>BMF 303</b> with rail	<b>BMF 303</b> C-slot, large	<b>BMF 303</b> Trapezoidal slot	<b>BMF 303</b> U-slot	
<b>Ordering code</b>	<b>BAM00L8</b>	<b>BAM00LA</b>	<b>BAM00LF</b>	<b>BAM01K4</b>	
Part number	BMF 303-HW-60	BMF 303-HW-62	BMF 303-HW-80	BMF 303-HW-103	
Installation advantages					
Cylinder type, for example	SMC Slot A and Slot B for expanding the BMF 303-HW-51	Numatics, Norgren	Bosch	SMC CP95	
Dimensions of cylinder slot					

**Expansion of the HW-51 with HW-60:** for fastening the sensor next to the slot. This lets you attach two sensors to the cylinder even when space is tight. For example, 2x HW-51 + 2x HW-60 or 2x HW-51 + 1x HW-60

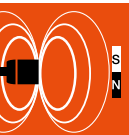


# Magnetic Cylinder Sensors with Mounting System BMF 303 mounting bracket



robust

<b>BMF 303</b> T-slot	<b>BMF 303</b> T-slot	<b>BMF 303</b> Trapezoidal slot	<b>BMF 303</b> with rail	<b>BMF 303</b> Round cylinder
<b>BAM00L4</b> BMF 303-HW-40	<b>BAM00L2</b> BMF 303-HW-33	<b>BAM01K9</b> BMF 303-HW-101	<b>BAM00L6</b> BMF 303-HW-51	<b>BAM00L7</b> BMF 303-HW-59
Festo, Bosch, SMC	Festo, Bosch, SMC	Bosch, Parker, Norgren	SMC Slot A, Slot B	Without slot, round cylinder Ø 8...80 mm with hose clamp



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

BMF 103  
BMF 303  
BMF 305  
BMF 21  
Total Productive Maintenance

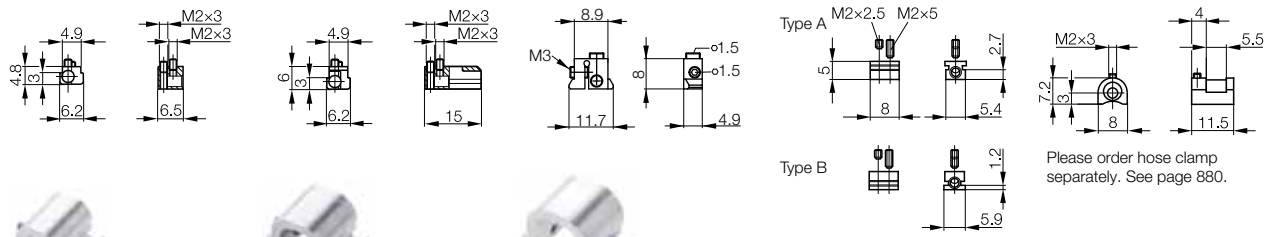
Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

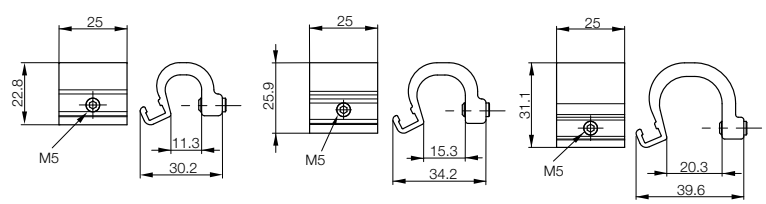


<b>BMF 303</b> Profile/tie rod	<b>BMF 303</b> Profile/tie rod	<b>BMF 303</b> Profile/tie rod
<b>BAM01M9</b> BMF 235-HW-109	<b>BAM01MA</b> BMF 235-HW-110	<b>BAM01MC</b> BMF 235-HW-111
For profile/tie rod cylinders <b>5...11 mm</b> in conjunction with T-slot holder, for example BAM00L2	For profile/tie rod cylinders <b>9...15 mm</b> in conjunction with T-slot holder, for example BAM00L2	For profile/tie rod cylinders <b>14...20 mm</b> in conjunction with T-slot holder, for example BAM00L2

Sensor disappears in the slot.

Switching point adjusted in seconds! Open screw with one turn, adjust position, tighten.

Switching point cannot be lost. Even if you replace the sensor, the adjusted switching point is permanently set by the mounting bracket.



## Recommended accessories (please order separately)



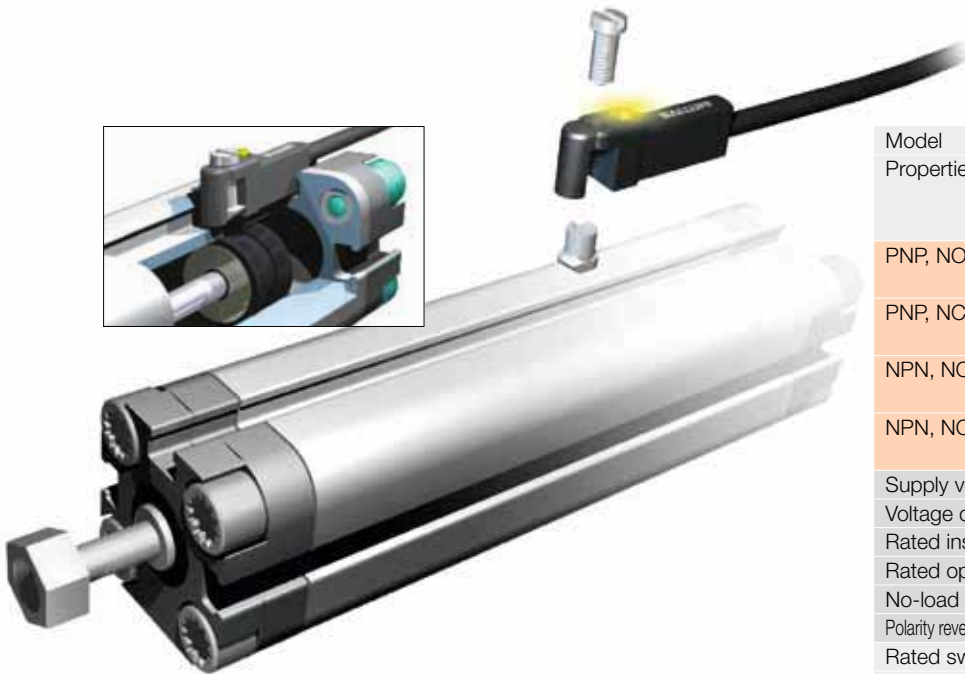
Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.



# Magnetic Cylinder Sensors with Mounting System

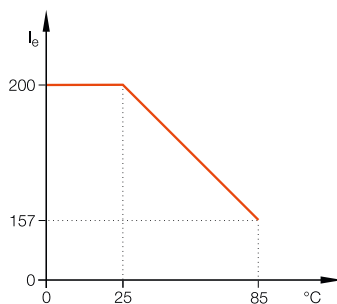
## BMF 305

The all-rounder for position monitoring on large actuators



Model Properties	
PNP, NO	<b>Ordering code</b> Part number
PNP, NC	<b>Ordering code</b> Part number
NPN, NO	<b>Ordering code</b> Part number
NPN, NC	<b>Ordering code</b> Part number
Supply voltage $U_S$	
Voltage drop $U_d$	
Rated insulation voltage $U_i$	
Rated operating current $I_e$	
No-load supply current $I_0$ max.	
Polarity reversal protected/transposition protected/short-circuit protected	
Rated switching field strength $ H_n $	
Assured switching field strength $ H_a $	
Hysteresis of $ H_n $	
Temperature drift of switch-on point of $ H_n $	
On/off delay	
Ambient temperature $T_a$	
Degree of protection as per IEC 60529	
Approval	
Material	Housing
Connection	

Temperature load curve



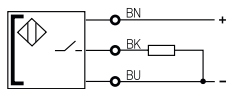
Basic information and definitions can be found on page 976, associated mounting brackets for BMF 305 can be found on page 836.

**Additional cable lengths on request.**

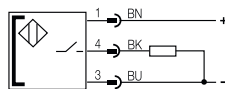
### Wiring diagrams

NO

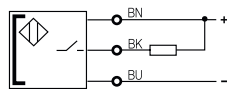
PNP/cable



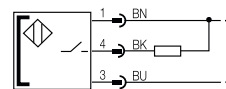
PNP/connector



NPN/cable

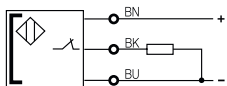


NPN/connector

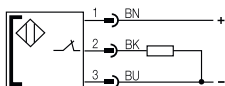


NC

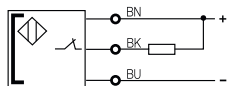
PNP/cable



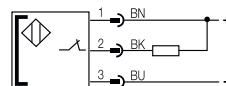
PNP/connector



NPN/cable



NPN/connector



# Magnetic Cylinder Sensors with Mounting System

## BMF 305



Model	Description	Model	Description	Model	Description	Model	Description
<b>BMF 305</b>	The all-rounder for position monitoring with M8 connector	<b>BMF 305</b>	The all-rounder for position monitoring with M8 connector	<b>BMF 305</b>	The all-rounder for position monitoring with M12 connector	<b>BMF 305</b>	The all-rounder for position monitoring with M12 connector
<b>BMF005L</b>	BMF 305K-PS-C-2-SA2-S49-00,3	<b>BMF0060</b>	BMF 305K-PS-C-2-SA95-S75-00,3	<b>BMF0058</b>	BMF 305K-PS-C-2-S4-00,2	<b>BMF005Z</b>	BMF 305K-PS-C-2-SA95-S4-00,3
<b>BMF0055</b>	BMF 305K-PO-C-2-SA2-S49-00,3						
<b>BMF0050</b>	BMF 305K-NS-C-2-SA2-S49-00,3						
<b>BMF004U</b>	BMF 305K-NO-C-2-SA2-S49-00,3						
							<b>BMF0056</b>
							BMF 305K-PS-C-2-PU-02
							<b>BMF0052</b>
							BMF 305K-PO-C-2-PU-02
							<b>BMF004W</b>
							BMF 305K-NS-C-2-PU-02
							<b>BMF004P</b>
							BMF 305K-NO-C-2-PU-02
10...30 V DC	10...30 V DC	10...30 V DC	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	≤ 2 V	≤ 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	75 V DC	75 V DC	75 V DC
200 mA	200 mA	100 mA	200 mA	200 mA	200 mA	200 mA	200 mA
≤ 30 mA	≤ 30 mA	≤ 5 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA
Yes/Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
1.2 kA/m	1.2 kA/m	1.2 kA/m	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	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m
≤ 45%	≤ 45%	≤ 45%	≤ 45%	≤ 45%	≤ 45%	≤ 45%	≤ 45%
≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C
≤ 0.05 ms/≤ 0.05 ms	≤ 0.05 ms	≤ 0.07 ms	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms	≤ 0.05 ms
-25...+85 °C	-25...+85 °C	-25...+70 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C
IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
LCP	LCP	LCP	LCP	LCP	LCP	LCP	LCP
0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 4-pin	0.2 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3x0.14 mm <sup>2</sup>



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

BMF 103

BMF 303

**BMF 305**

BMF 21

Total Productive Maintenance

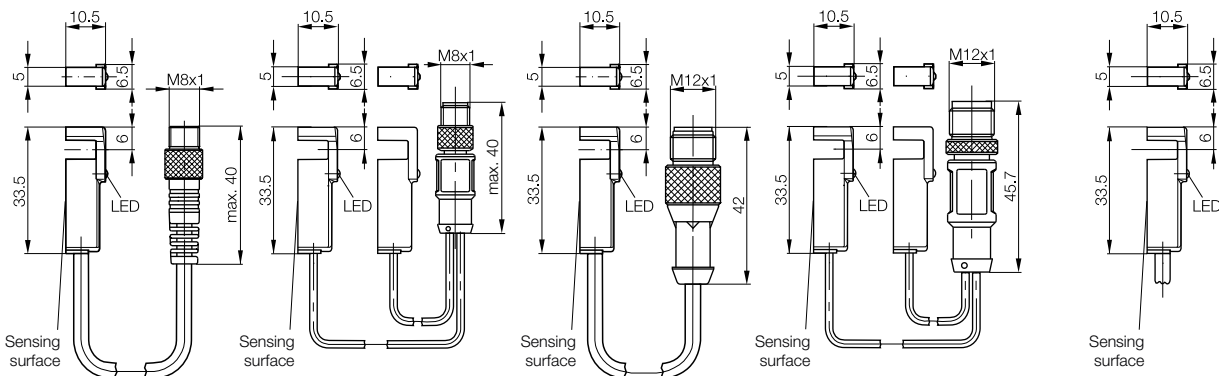
Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement














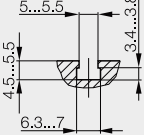
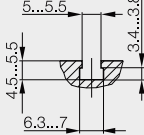
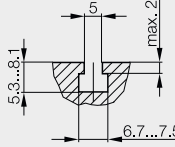
Accessories for Magnetic Cylinder Sensors

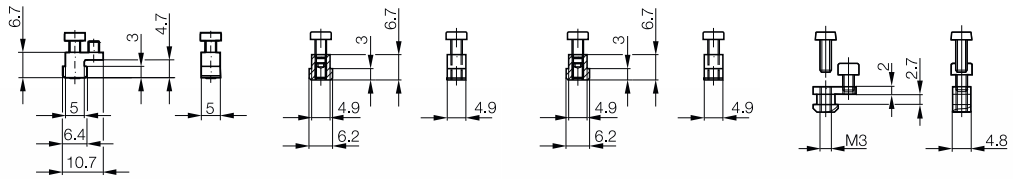












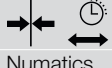


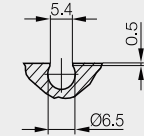
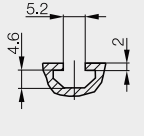
Suitable mounting brackets for BMF 305 can be found on **page 836**

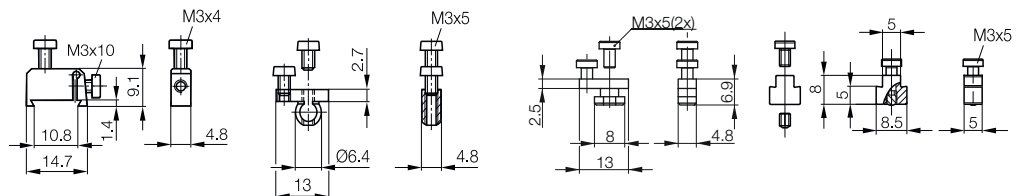
# Magnetic Cylinder Sensors with Mounting System

## BMF 305 mounting bracket











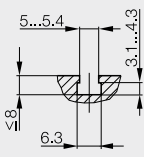
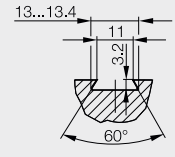
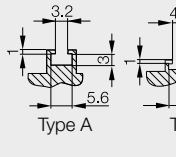
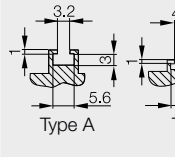
	 For lateral mounting	 For lateral mounting	 with hollow bolt	 For lateral mounting, can be inserted from above
Mounting bracket for Slot	 T-slot	 T-slot	 T-slot	 T-slot
<b>Ordering code</b>	<b>BAM00LH</b>	<b>BAM00LJ</b>	<b>BAM01EZ</b>	<b>BAM00LM</b>
Part number	BMF 305-HW-17	BMF 305-HW-20	BMF 305-HW-98	BMF 305-HW-22
Installation advantages				
Cylinder type, for example	Festo, SMC, Bosch	Festo, SMC, Bosch	Festo, SMC, Bosch	Festo, SMC, Bosch
Dimensions of cylinder slot				



				
Mounting bracket for Slot	 Trapezoidal guide	 C-slot, large	 C-slot, large	 Profile cylinder
<b>Ordering code</b>	<b>BAM00LU</b>	<b>BAM00LW</b>	<b>BAM01C4</b>	<b>BAM00M9</b>
Part number	BMF 305-HW-27	BMF 305-HW-32	BMF 305-HW-92	BMF 305-HW-64
Installation advantages				
Cylinder type, for example	Bosch	Norgren	Numatics	Bosch
Dimensions of cylinder slot				



# Magnetic Cylinder Sensors with Mounting System BMF 305 mounting bracket

Can be installed from above		With slotted screw		With Allen screw
				
<b>BMF 305</b>	<b>BMF 305</b>	<b>BMF 305</b>	<b>BMF 305</b>	<b>BMF 305</b>
T-slot	Round cylinder	Trapezoidal slot	with rail	with rail
<b>BAM00LN</b>	<b>BAM00LP</b>	<b>BAM01K8</b>	<b>BAM00LT</b>	<b>BAM01EY</b>
BMF 305-HW-23	BMF 305-HW-24	BMF 305-HW-106	BMF 305-HW-26	BMF 305-HW-99
				
Festo, SMC, Bosch	Round cylinder Ø 8...80 mm		SMC	SMC
				



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

- BMF 103
- BMF 303
- BMF 305**
- BMF 21
- Total Productive Maintenance

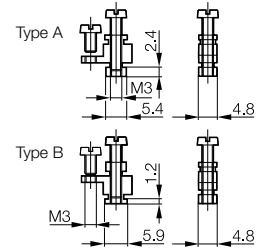
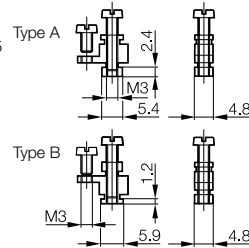
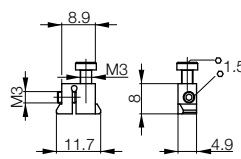
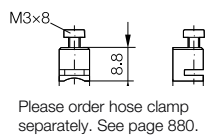
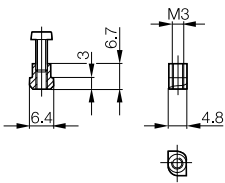
Magnetic Cylinder Sensors with a Compact Design













Magnetic Cylinder Sensors with Special Properties

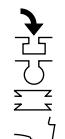
Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors



Can be inserted in slot from above		Quick and time-saving	
			
<b>BMF 305</b>	<b>BMF 305</b>	<b>BMF 305</b>	<b>BMF 305</b>
Profile/tie rod	Profile/tie rod	Profile/tie rod	Profile/tie rod
<b>BAM01M9</b>	<b>BAM01MA</b>	<b>BAM01MC</b>	
BMF 235-HW-109	BMF 235-HW-110	BMF 235-HW-111	
			
For profile/tie rod cylinders <b>5...11 mm</b> in conjunction with T-slot holder, for example BAM01EZ	For profile/tie rod cylinders <b>9...15 mm</b> in conjunction with T-slot holder, for example BAM01EZ	For profile/tie rod cylinders <b>14...20 mm</b> in conjunction with T-slot holder, for example BAM01EZ	
			
			Switching point cannot be lost. Even if you replace the sensor, the adjusted switching point is permanently set by the mounting bracket.



Can be inserted in slot from above. At any time, even later. Quick and time-saving.

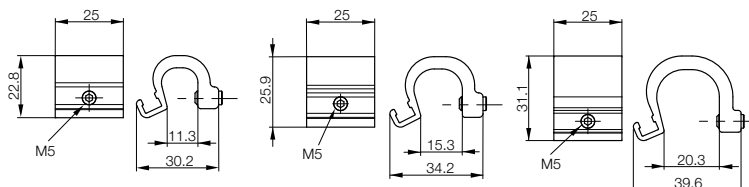


Switching point adjusted in seconds! Open screw with one turn, adjust position, tighten.



Switching point cannot be lost. Even if you replace the sensor, the adjusted switching point is permanently set by the mounting bracket.

## Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.

# Magnetic Cylinder Sensors with Mounting System

## BMF 21

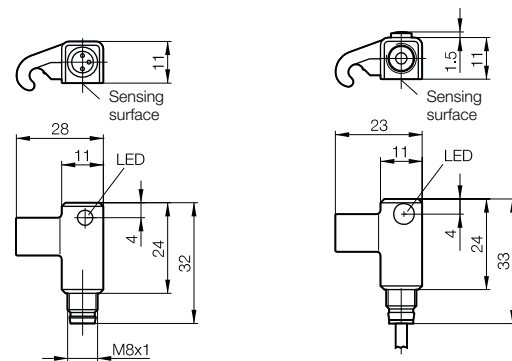
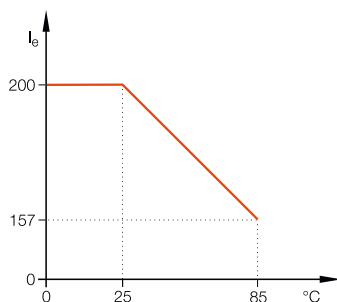


Model		<b>BMF 21</b>	<b>BMF 21</b>
Properties		The classics for cylinders with tie rod, DUO rail, round cylinder and profile cylinder with M8 connector	The classics for cylinders with tie rod, DUO rail, round cylinder and profile cylinder with direct PUR cable
PNP, NO	<b>Ordering code</b>	<b>BMF0029</b>	<b>BMF0026</b>
	Part number	BMF 21K-PS-C-2-S49	BMF 21K-PS-C-2-PU-02
NPN, NO	<b>Ordering code</b>	<b>BMF0025</b>	<b>BMF0023</b>
	Part number	BMF 21K-NS-C-2-S49	BMF 21K-NS-C-2-PU-02
Supply voltage $U_S$		10...30 V DC	10...30 V DC
Voltage drop $U_d$		$\leq 3.1$ V	$\leq 3.1$ V
Rated insulation voltage $U_i$		75 V DC	75 V DC
Rated operating current $I_e$		200 mA	200 mA
No-load supply current $I_0$ max.		$\leq 30$ mA	$\leq 30$ mA
Polarity reversal/short-circuit protected		Yes/Yes	Yes/Yes
Rated switching field strength $I H_n I$		1.2 kA/m	1.2 kA/m
Assured switching field strength $I H_a I$		$\geq 2$ kA/m	$\geq 2$ kA/m
Hysteresis of $I H_n I$		$\leq 45\%$	$\leq 45\%$
Temperature drift of switch-on point of $I H_n I$		$\leq 0.3 \text{ \%}/^\circ\text{C}$	$\leq 0.3 \text{ \%}/^\circ\text{C}$
Turn-on delay		$\leq 0.05$ ms	$\leq 0.05$ ms
Turn-off delay		$\leq 0.05$ ms	$\leq 0.05$ ms
Ambient temperature $T_a$		-25...+85 °C	-25...+85 °C
Degree of protection as per IEC 60529		IP 67	IP 67
Approval		CE, cULus	CE
Material	Housing	PBT (fiberglass-reinforced)	PBT (fiberglass-reinforced)
Connection		M8 connector, 3-pin	2 m PUR cable, 3x0.14 mm <sup>2</sup>

Basic information and definitions can be found on page 976, associated mounting brackets for BMF 21 can be found on page 839.

**Additional cable lengths on request.**

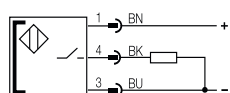
### Temperature load curve



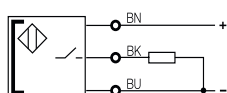
### Wiring diagrams

NO

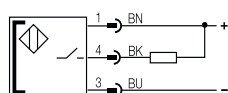
PNP/cable



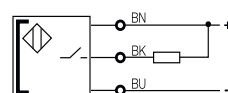
PNP/connector



NPN/cable



NPN/connector



# Magnetic Cylinder Sensors with Mounting System

## BMF 21 mounting bracket



Mounting bracket for Slot	Tie rod	Profile/tie rod	Profile/tie rod	Round cylinder
<b>Ordering code</b>	<b>BAM00KY</b>	<b>BAM00KT</b>	<b>BAM00KU</b>	<b>BAM00KW</b>
Part number	BMF 21-HW-8	BMF 21-HW-10	BMF 21-HW-10-E	BMF 21-HW-11
Cylinder type	For pneumatic cylinders with tie rod, any piston diameter, tie rod diameter <b>up to 6.5 mm</b> .  Pneumatic cylinder with DUO rail (Festo), any piston diameter	For pneumatic cylinders with tie rod. Any piston diameter, tie rod diameter <b>up to 17 mm</b> .  For pneumatic cylinder with tie rod integrated in housing (profile). Any piston diameter, profile width <b>up to 17 mm</b> .	For pneumatic cylinders with tie rod. Any piston diameter, tie rod diameter <b>up to 17 mm</b> .  For pneumatic cylinder with tie rod integrated in housing (profile). Any piston diameter, profile width <b>up to 17 mm</b> .  <b>Stainless steel 1.4305</b>	For pneumatic cylinders without tie rod/rail. Piston diameter <b>8...80 mm</b> . Mounting bracket usable only with hose clamps.
Cylinder				



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

BMF 103  
BMF 303  
BMF 305  
**BMF 21**

Total Productive Maintenance

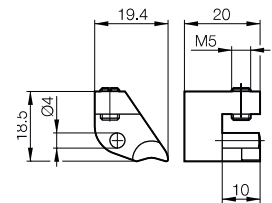
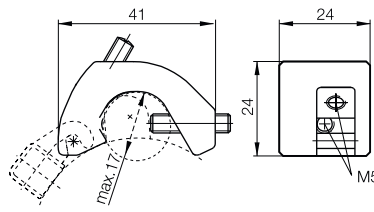
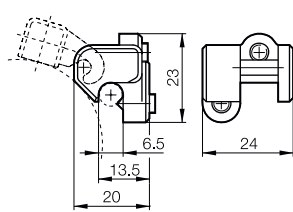
Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors



Please order hose clamp separately. See page 880.

### Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.



# Magnetic Cylinder Sensors

## Ready for Total Productive Maintenance (TPM)











The advantages of the sensors with a perfect mounting system, all in a single case. With just one order number you can cover the position detection for all common pneumatic cylinders.

- Time and cost savings every time a sensor is changed
- Covers all common pneumatic cylinders
- Clearly laid out for easy handling



# Magnetic Cylinder Sensors

## Ready for Total Productive Maintenance (TPM)

	Conventional sensors	BMF service case with sensors BMF 103, 303, 305 and mounting system
<b>Sensor replacement</b>		 <ul style="list-style-type: none"> <li>■ Case has space to store all the necessary materials</li> <li>■ Mounting system retains the switching point when device is replaced</li> </ul>
<b>Complexity</b>		 <ul style="list-style-type: none"> <li>■ Standard operating principle for all cylinders</li> <li>■ Very easy installation</li> </ul>
<b>Variety of models</b>		 <ul style="list-style-type: none"> <li>■ One sensor for all cylinders</li> <li>■ Reduce your storage costs</li> </ul>
<b>Service life</b>		 <ul style="list-style-type: none"> <li>■ Robust metal clamp</li> <li>■ Fully electronic, wear-free</li> </ul>
<b>€</b>		 <p><b>Sensors with the Balluff mounting system can reduce your costs significantly.</b></p>



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

- BMF 103
- BMF 303
- BMF 305
- BMF 21

**Total Productive Maintenance**

Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

- Contains detailed information
- Particularly user-friendly due to the ingenious overview of contents
- Cover flap seals tightly when closed
- Contains two BMF 103, 303, and 305 sensors
- Contains two mounting elements for all common slots
- Robust, industrial aluminum case
- Contains an extensive range of accessories



Description	<b>BMF service case</b>
Ordering code	<b>BAV0005</b>
Part number	BAV AS-OD-00002-01





# Magnetic Cylinder Sensors

## Magnetic cylinder sensors with a compact design

Compact magnetic cylinder sensors are adapted to the various slot shapes and thus have a perfect hold. They can not only be installed flush in the respective slot, but also fit in completely.

Some series can even be installed, for example, if the cylinder cover is not allowing them to be pushed in. These can be inserted from above.

### **Global: The complete series of standard sensors**

Magnetic standard cylinder sensors are mostly available ex warehouse, can be used around the world, and meet worldwide standards. They offer an optimal price/performance ratio.

Compact designs for

- Insertion from above or the side
- Cable and connector versions
- V-Twin variants available

# Global

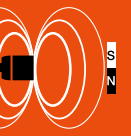


# Magnetic Cylinder Sensors with a Compact Design

## Contents

### Magnetic Cylinder Sensors with a Compact Design

BMF 204 Global	844
BMF 214 Global	846
BMF 243 Global	848
BMF 235 Global	850
BMF 307	852



Basic information and definitions can be found on **page 934**.



# Magnetic Cylinder Sensors with a Compact Design

## BMF 204 Global

# C-slot (size 10 slot)

## Global

### Secure hold in the slot

The design is adapted to the slot, i.e. the sensor can be inserted into the slot.

### Installed and adjusted quickly and easily

The retaining element is integrated into the sensor.

### Can also be used in space-critical applications

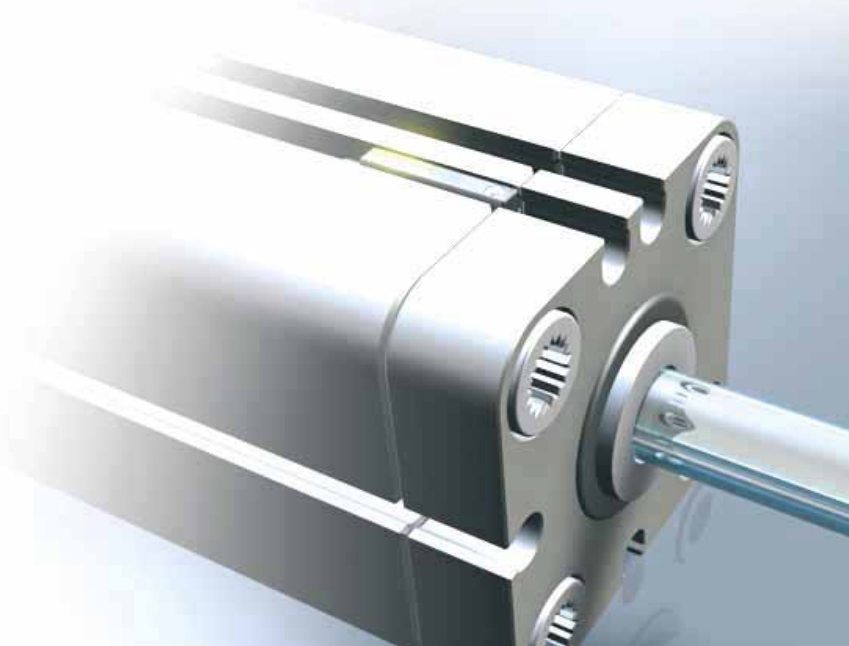
Flush-fitting, the sensor "disappears" in the slot.

### Optimum solution for every gripper and short-stroke cylinder

Miniature design, extremely short



Model	
Properties	
PNP, NO	<b>Ordering code</b>
	Part number
Supply voltage $U_S$	
Voltage drop $U_d$	
Rated insulation voltage $U_i$	
Rated operating current $I_o$	
No-load supply current $I_o$ max.	
Polarity reversal protected/transposition protected/short-circuit protected	
Rated switching field strength $I H_n I$	
Assured switching field strength $I H_a I$	
Temperature drift of switch-on point of $I H_n I$	
On/off delay	
Ambient temperature $T_a$	
Degree of protection as per IEC 60529	
Approval	
Material	Housing
Connection	
Assembly	
Slot	



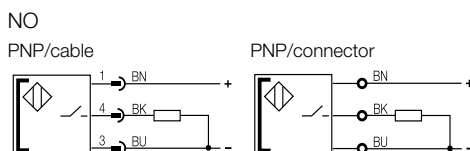
Basic information and definitions can be found on page 976.

**Additional cable lengths on request.**

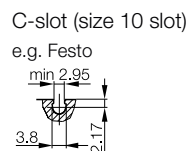


The BMF 204 and BMF 214 have an impressive, extremely compact design.

### Wiring diagrams



### Slot dimension



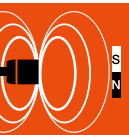


# Magnetic Cylinder Sensors with a Compact Design

## BMF 204 Global



	BMF 204	BMF 204	BMF 204	BMF 204	BMF 204
	Small housing for the Festo C-slot with M8 connector	Small housing for the Festo C-slot with M8 connector	Small housing for the Festo C-slot with M12 connector	Small housing for the Festo C-slot with M12 connector	Small housing for the Festo C-slot with direct PUR cable
	<b>BMF0002</b>	<b>BMF0006</b>	<b>BMF00A6</b>	<b>BMF0005</b>	<b>BMF0001</b>
	BMF 204K-PS-C-2A-SA2-S49-00,3	BMF 204K-PS-C-2A-SA95-S75-00,3	BMF 204K-PS-C-2A-SA2-S4-00,3	BMF 204K-PS-C-2A-SA95-S4-00,3	BMF 204K-PS-C-2A-PU-02
	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	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
	75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
	100 mA	100 mA	100 mA	100 mA	100 mA
	≤ 8 mA	≤ 8 mA	≤ 8 mA	≤ 8 mA	≤ 8 mA
	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
	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
	≤ 0.3%/°C	≤ 0.3%/°C	≤ 0.3%/°C	≤ 0.3%/°C	≤ 0.3%/°C
	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms
	-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C
	IP 67	IP 67	IP 67	IP 67	IP 67
	CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
	PA 12	PA 12	PA 12	PA 12	PA 12
	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3×0.1 mm <sup>2</sup>
	Can be inserted from the side	Can be inserted from the side	Can be inserted from the side	Can be inserted from the side	Can be inserted from the side
	☐ C-slot (size 10 slot)	☐ C-slot (size 10 slot)	☐ C-slot (size 10 slot)	☐ C-slot (size 10 slot)	☐ C-slot (size 10 slot)



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

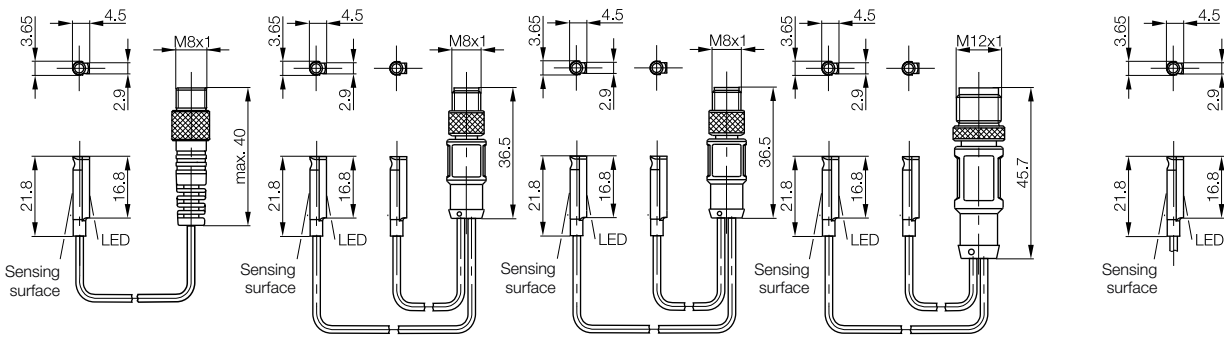
- BMF 204 Global
- BMF 214 Global
- BMF 243 Global
- BMF 235 Global
- BMF 307

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors



### Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.

# Magnetic Cylinder Sensors with a Compact Design

## BMF 214 Global

# C-slot (rounded slot)

## Global

### Secure hold in the slot

The design is adapted to the slot, i.e. the sensor can be inserted into the slot.

### Installed and adjusted quickly and easily

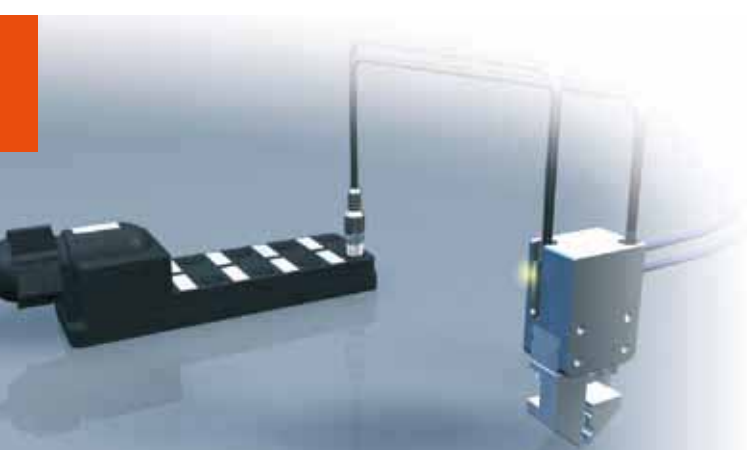
The retaining element is integrated into the sensor.

### Can also be used in space-critical applications

Flush-fitting, the sensor "disappears" in the slot.

### Optimum solution for every gripper and short-stroke cylinder

Miniature design, extremely short.



Model	
Properties	
PNP, NO	<b>Ordering code</b>
	Part number
Supply voltage $U_S$	
Voltage drop $U_d$	
Rated insulation voltage $U_i$	
Rated operating current $I_o$	
No-load supply current $I_o$ max.	
Polarity reversal protected/transposition protected/short-circuit protected	
Rated switching field strength $I H_n I$	
Assured switching field strength $I H_a I$	
Temperature drift of switch-on point of $I H_n I$	
On/off delay	
Ambient temperature $T_a$	
Degree of protection as per IEC 60529	
Approval	
Material	Housing
Connection	
Assembly	
Slot	

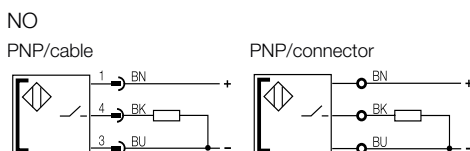
Basic information and definitions can be found on page 976.

**Additional cable lengths on request.**

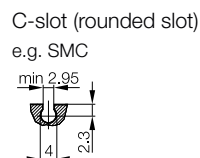
### V-Twin – two sensors, one connector

- Save on connectors and increase value creation.
- Just one plug-in position for two sensors.
- Flexibly detect multiple positions on pneumatic grippers and cylinders.

### Wiring diagrams



### Slot dimension



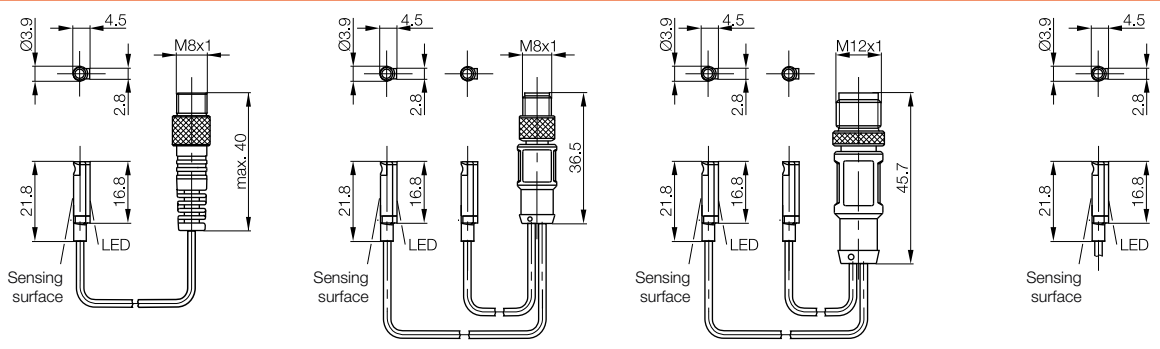


# Magnetic Cylinder Sensors with a Compact Design

## BMF 214 Global



BMF 214	BMF 214	BMF 214	BMF 214
Small housing for the SMC C-slot with M8 connector	Small housing for the SMC C-slot with M8 connector	Small housing for the SMC C-slot with M12 connector	Small housing for the SMC C-slot with direct PUR cable
<b>BMF00A2</b>	<b>BMF00A5</b>	<b>BMF00A4</b>	<b>BMF00A1</b>
BMF 214K-PS-C-2A-SA2-S49-00,3	BMF 214K-PS-C-2A-SA95-S75-00,3	BMF 214K-PS-C-2A-SA95-S4-00,3	BMF 214K-PS-C-2A-PU-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 2.5 V	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA	100 mA
≤ 8 mA	≤ 8 mA	≤ 8 mA	≤ 8 mA
Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
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
≤ 0.3%/°C	≤ 0.3%/°C	≤ 0.3%/°C	≤ 0.3%/°C
≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms
-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C
IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus
PA 12	PA 12	PA 12	PA 12
0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3x0.1 mm <sup>2</sup>
Can be inserted from the side	Can be installed from above	Can be installed from above	Can be installed from above
∩ C-slot (rounded slot)	∩ C-slot (rounded slot)	∩ C-slot (rounded slot)	∩ C-slot (rounded slot)



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

- BMF 204 Global
- BMF 214 Global**
- BMF 243 Global
- BMF 235 Global
- BMF 307

Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

### Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.

# Magnetic Cylinder Sensors with a Compact Design

## BMF 243 Global

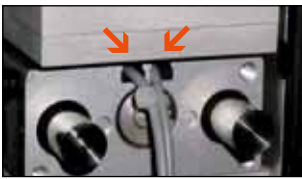
# C-slot (rounded groove 3.9 mm)



**New mounting concept**  
Secure hold in the slot;  
Sensor cannot be torn out of the groove.



**Can be installed in the slot from above**  
Can be installed even on cylinders with a covered slot



**Compact design, i.e. can be mounted flush**  
Can also be used in space-critical applications



**As short as possible (24 mm)**  
Can also be used in space-critical applications



Model Properties		
PNP, NO	<b>Ordering code</b>	
	Part number	
PNP, NC	<b>Ordering code</b>	
	Part number	
NPN, NO	<b>Ordering code</b>	
	Part number	
NPN, NC	<b>Ordering code</b>	
	Part number	
Supply voltage $U_S$		
Voltage drop $U_d$		
Rated insulation voltage $U_i$		
Rated operating current $I_o$		
No-load supply current $I_o$ max.		
Polarity reversal protected/transposition protected/short-circuit protected		
Rated switching field strength $I H_n I$		
Assured switching field strength $I H_a I$		
On/off delay		
Ambient temperature $T_a$		
Degree of protection as per IEC 60529		
Approval		
Material	Housing	
Connection		
Assembly		
Slot		

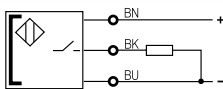
Basic information and definitions can be found on page 976.

**Additional cable lengths on request.**

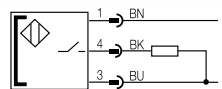
### Wiring diagrams

NO

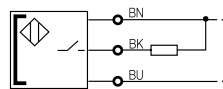
PNP/cable



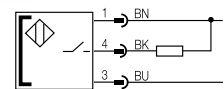
PNP/connector



NPN/cable

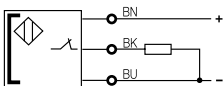


NPN/connector

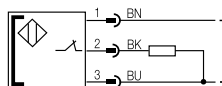


NC

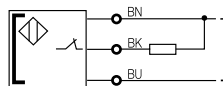
PNP/cable



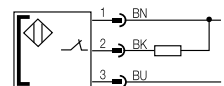
PNP/connector



NPN/cable



NPN/connector





# Magnetic Cylinder Sensors with a Compact Design

## BMF 243 Global



	<b>BMF 243</b>	<b>BMF 243</b>	<b>BMF 243</b>	<b>BMF 243</b>
	The new benchmark for the C-slot (rounded groove) with M8 connector	The new benchmark for the C-slot (rounded groove) with M8 connector	The new benchmark for the C-slot (rounded groove) with M12 connector	The new benchmark for the C-slot (rounded groove) with direct PUR cable
	<b>BMF00EL</b>	<b>BMF00ET</b>	<b>BMF00ER</b>	<b>BMF00EF</b>
	BMF 243K-PS-C-2A-SA2-S49-00,3	BMF 243K-PS-C-2A-SA95-S75-00,3	BMF 243K-PS-C-2A-SA2-S4-00,3	BMF 243K-PS-C-2A-PU-02
	<b>BMF00EM</b>			<b>BMF00EH</b>
	BMF 243K-PO-C-2A-SA2-S49-00,3			BMF 243K-PO-C-2A-PU-02
	<b>BMF00EN</b>			<b>BMF00EJ</b>
	BMF 243K-NS-C-2A-SA2-S49-00,3			BMF 243K-NS-C-2A-PU-02
	<b>BMF00EP</b>			<b>BMF00EK</b>
	BMF 243K-NO-C-2A-SA2-S49-00,3			BMF 243K-NO-C-2A-PU-02
	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
	≤ 2.4 V	≤ 2.4 V	≤ 2.4 V	≤ 2.4 V
	75 V DC	75 V DC	75 V DC	75 V DC
	100 mA	100 mA	100 mA	100 mA
	7.5 mA	7.5 mA	7.5 mA	7.5 mA
	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
	2 kA/m	2 kA/m	2 kA/m	2 kA/m
	≥ 2.4 kA/m	≥ 2.4 kA/m	≥ 2.4 kA/m	≥ 2.4 kA/m
	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms	≤ 0.07 ms/≤ 0.07 ms
	-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C
	IP 67	IP 67	IP 67	IP 67
	CE, cULus	CE, cULus	CE, cULus	CE, cULus
	PA 12 and A2 steel	PA 12 and A2 steel	PA 12 and A2 steel	PA 12 and A2 steel
	0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3×0.10 mm <sup>2</sup>
	Can be installed from above	Can be installed from above	Can be installed from above	Can be installed from above
	∩ C-slot (rounded groove 3.9 mm)	∩ C-slot (rounded groove 3.9 mm)	∩ C-slot (rounded groove 3.9 mm)	∩ C-slot (rounded groove 3.9 mm)



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

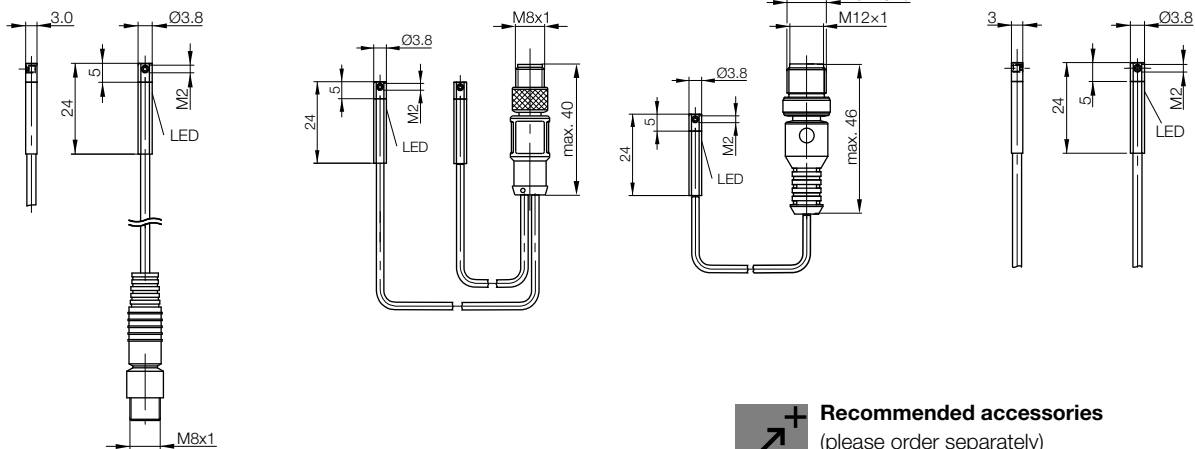
BMF 204 Global  
BMF 214 Global  
**BMF 243 Global**  
BMF 235 Global  
BMF 307

Magnetic Cylinder Sensors with Special Properties

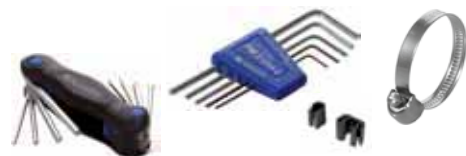
Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors



### Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.



# Magnetic Cylinder Sensors with a Compact Design

## BMF 235 Global



### Very bright LED

Reliable detection of switching function from far away (25 m in bright factory building).



### New mounting concept

Secure hold in the slot; Sensor cannot be torn out of the groove.

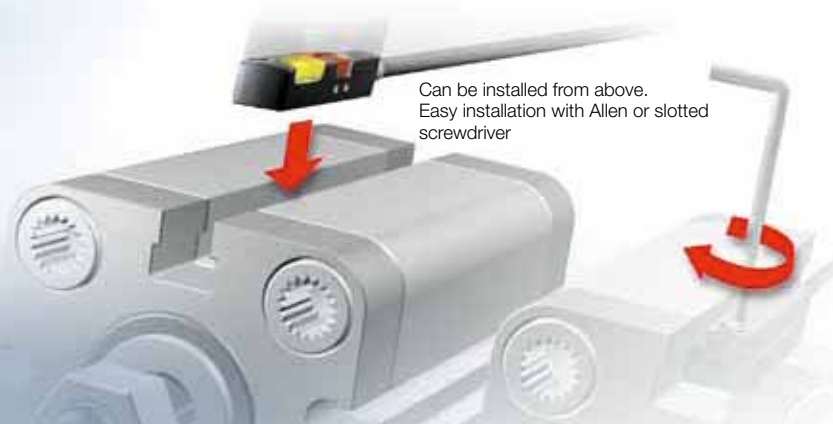


### Knurled screw

Sensor screws in firmly; extremely secure hold in any slot (e.g. Parker, Festo, SMC, Bosch).



Model Properties		
PNP, NO	<b>Ordering code</b>	
	Part number	
PNP, normally closed	<b>Ordering code</b>	
	Part number	
NPN, NO	<b>Ordering code</b>	
	Part number	
NPN, NC	<b>Ordering code</b>	
	Part number	
Supply voltage $U_S$		
Voltage drop $U_d$		
Rated insulation voltage $U_i$		
Rated operating current $I_o$		
No-load supply current $I_o$ max.		
Polarity reversal protected/transposition protected/short-circuit protected		
Rated switching field strength $ H_n $		
Assured switching field strength $ H_a $		
Temperature drift of switch-on point of $ H_n $		
On/off delay		
Ambient temperature $T_a$		
Degree of protection as per IEC 60529		
Approval		
Material	Housing	
Connection		
Assembly		
Slot		



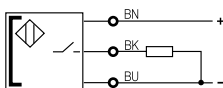
Basic information and definitions can be found on page 976.

**Additional cable lengths on request.**

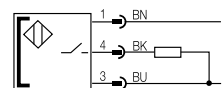
### Wiring diagrams

NO

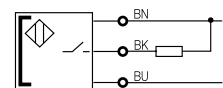
PNP/cable



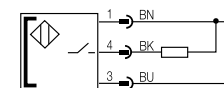
PNP/connector



NPN/cable

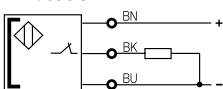


NPN/connector

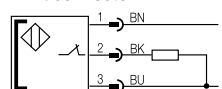


NC

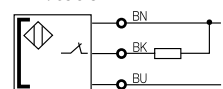
PNP/cable



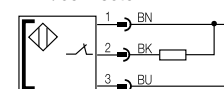
PNP/connector



NPN/cable



NPN/connector



Cylinder profile	Mounting bracket	See page
Profile cylinder and tie rod up to 5...11 mm	Ordering code: <b>BAM01M9</b>	833
Profile cylinder and tie rod up to 9...15 mm	Ordering code: <b>BAM01MA</b>	833
Profile cylinder and tie rod 14...20 mm	Ordering code: <b>BAM01MC</b>	833
Round cylinder	Ordering code: <b>BAM01Y9</b>	





# Magnetic Cylinder Sensors with a Compact Design

## BMF 235 Global



BMF 235	BMF 235	BMF 235	BMF 235	BMF 235
The new benchmark for every T-slot with M8 connector	The new benchmark for every T-slot with M8 connector	The new benchmark for every T-slot with M12 connector	The new benchmark for every T-slot with M12 connector	The new benchmark for every T-slot with direct PUR cable
<b>BMF00C4</b>	<b>BMF00CA</b>	<b>BMF00C5</b>	<b>BMF00C9</b>	<b>BMF00AR</b>
BMF 235K-PS-C-2A-SA2-S49-00,3	BMF 235K-PS-C-2A-SA95-S75-00,3	BMF 235K-PS-C-2A-SA2-S4-00,3	BMF 235K-PS-C-2A-SA95-S4-00,3	BMF 235K-PS-C-2A-PU-02
<b>BMF00C6</b>				<b>BMF00AT</b>
BMF 235K-PO-C-2A-SA2-S49-00,3				BMF 235K-PO-C-2A-PU-02
<b>BMF00C2</b>				<b>BMF00AU</b>
BMF 235K-NS-C-2A-SA2-S49-00,3				BMF 235K-NS-C-2A-PU-02
<b>BMF00C3</b>				<b>BMF00AW</b>
BMF 235K-NO-C-2A-SA2-S49-00,3				BMF 235K-NO-C-2A-PU-02
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	≤ 2.5 V	≤ 2.5 V	≤ 2.5 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA	100 mA	100 mA
6 mA	6 mA	6 mA	6 mA	6 mA
Yes/No/Yes	Yes/No/Yes	Yes/No/Yes	Yes/No/Yes	Yes/No/Yes
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
≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C
≤ 0.1 ms/≤ 0.1 ms	≤ 0.1 ms/≤ 0.1 ms	≤ 0.1 ms/≤ 0.1 ms	≤ 0.1 ms/≤ 0.1 ms	≤ 0.1 ms/≤ 0.1 ms
-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
PA12	PA12	PA12	PA12	PA12
0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3×0.1 mm <sup>2</sup>
Can be installed from above	Can be installed from above	Can be installed from above	Can be installed from above	Can be installed from above
┌┐ T-slot	┌┐ T-slot	┌┐ T-slot	┌┐ T-slot	┌┐ T-slot

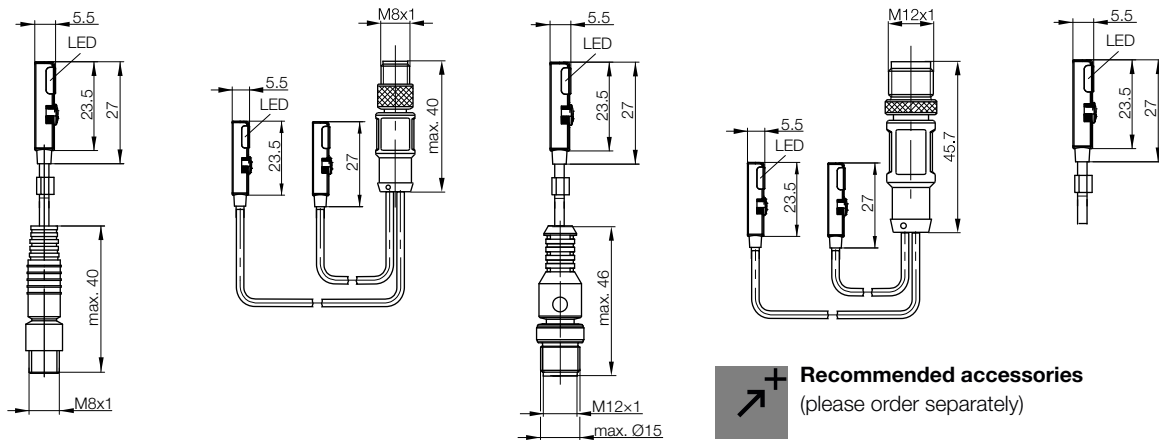


Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

BMF 204 Global  
BMF 214 Global  
BMF 243 Global  
**BMF 235 Global**  
BMF 307



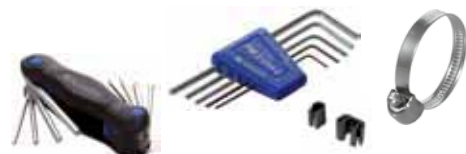
Magnetic Cylinder Sensors with Special Properties

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

### Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.

# Magnetic Cylinder Sensors with a Compact Design

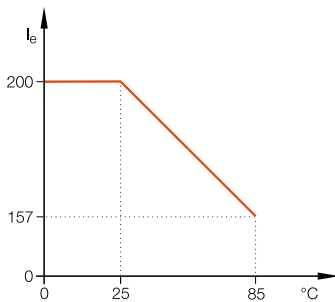
## BMF 307

# T-slot

The robust and compact sensor for the T-slot. The shape is adapted to the slot and guarantees a strong hold. The sensor slides into the slot from the side.



### Temperature load curve



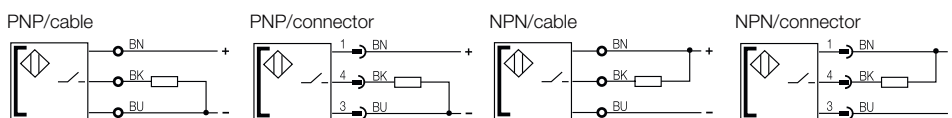
Model Properties	
PNP, NO	<b>Ordering code</b> Part number
PNP, normally closed	<b>Ordering code</b> Part number
NPN, NO	<b>Ordering code</b> Part number
NPN, NC	<b>Ordering code</b> Part number
Supply voltage U <sub>S</sub>	
Voltage drop U <sub>d</sub>	
Rated insulation voltage U <sub>i</sub>	
Rated operating current I <sub>e</sub>	
No-load supply current I <sub>0</sub> max.	
Polarity reversal protected/transposition protected/short-circuit protected	
Rated switching field strength  H <sub>n</sub>	
Assured switching field strength  H <sub>a</sub>	
Temperature drift of switch-on point of  H <sub>n</sub>	
On/off delay	
Ambient temperature T <sub>a</sub>	
Degree of protection as per IEC 60529	
Approval	
Material	Housing
Connection	
Assembly	
Slot	

Basic information and definitions can be found on page 976.

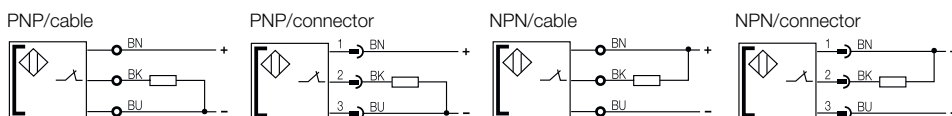
**Additional cable lengths on request.**

### Wiring diagrams

#### NO



#### NC



Cylinder profile	Mounting bracket	See page
Profile cylinder and tie rod up to 5...11 mm	Ordering code: <b>BAM01M9</b>	833
Profile cylinder and tie rod up to 9...15 mm	Ordering code: <b>BAM01MA</b>	833
Profile cylinder and tie rod 14...20 mm	Ordering code: <b>BAM01MC</b>	833
Round cylinder	Ordering code: <b>BAM01Y9</b>	





# Magnetic Cylinder Sensors with a Compact Design

## BMF 307



BMF 307	BMF 307	BMF 307	BMF 307	BMF 307
The compact sensor for the T-slot with M8 connector	The compact sensor for the T-slot with M8 connector	The compact sensor for the T-slot with M12 connector	The compact sensor for the T-slot with M12 connector	The compact sensor for the T-slot with direct PUR cable
<b>BMF0072</b>	<b>BMF0077</b>	<b>BMF006Y</b>	<b>BMF0076</b>	<b>BMF006U</b>
BMF307K-PS-C-2-SA2-S49-00,3	BMF307K-PS-C-2-SA95-S75-00,3	BMF307K-PS-C-2-S4-00,2	BMF307K-PS-C-2-SA95-S4-00,3	BMF307K-PS-C-2-PU-02
<b>BMF006T</b>				<b>BMF006M</b>
BMF307K-PO-C-2-SA2-S49-00,3				BMF307K-PO-C-2-PU-02
<b>BMF006L</b>				<b>BMF006H</b>
BMF307K-NS-C-2-SA2-S49-00,3				BMF307K-NS-C-2-PU-02
<b>BMF006E</b>				<b>BMF0069</b>
BMF307K-NO-C-2-SA2-S49-00,3				BMF307K-NO-C-2-PU-02
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/Yes/Yes	Yes/Yes/Yes
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
≤ 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
-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C
IP 67	IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus	CE, cULus
LCP	LCP	LCP	LCP	LCP
0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 4-pin	0.2 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3×0.14 mm <sup>2</sup>
Can be inserted from the side	Can be inserted from the side	Can be inserted from the side	Can be inserted from the side	Can be inserted from the side
┌┐ T-slot	┌┐ T-slot	┌┐ T-slot	┌┐ T-slot	┌┐ T-slot



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

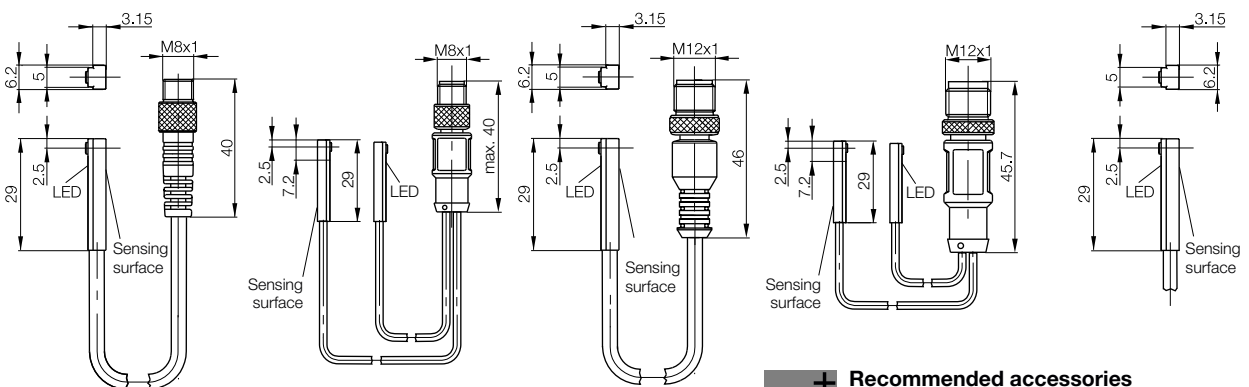
BMF 204 Global  
BMF 214 Global  
BMF 243 Global  
BMF 235 Global  
**BMF 307**

Magnetic Cylinder Sensors with Special Properties

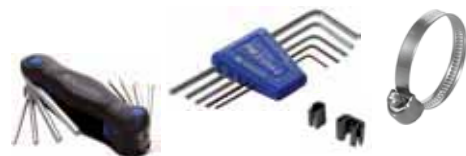
Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors



### Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.



# Magnetic Cylinder Sensors

## Magnetic cylinder sensors with special properties

Our magnetic cylinder sensors with special properties come in many different varieties, stainless steel or ATEX design. For radially magnetized magnets or with weld-immune electronics. And more. By means of their broad spectrum, the special features solve almost all applications – even in demanding environments.

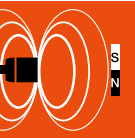


# Magnetic Cylinder Sensors with Special Properties

## Contents

### Magnetic Cylinder Sensors with Special Properties

Robust metal housings	856
With weld-immune electronics	860
High-temperature resistant up to 105 °C	862
For the food industry	863
ATEX cylinder sensor	865
Reed switches	866



Basic information and definitions can be found on **page 934**.

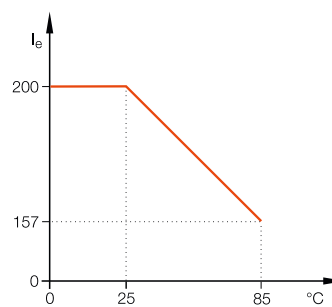




Model	
Properties	
PNP, NO	<b>Ordering code</b> Part number
NPN, NO	<b>Ordering code</b> Part number
Supply voltage $U_S$	
Voltage drop $U_d$	
Rated insulation voltage $U_i$	
Rated operating current $I_e$	
No-load supply current $I_0$ max.	
Polarity reversal protected/transposition protected/short-circuit protected	
Rated switching field strength $ H_n $	
Assured switching field strength $ H_a $	
Hysteresis of $ H_n $	
Temperature drift of switch-on point of $ H_n $	
On/off delay	
Ambient temperature $T_a$	
Degree of protection as per IEC 60529	
Approval	
Material	Housing
Connection	
Installation	

Basic information and definitions can be found on page 976; associated mounting brackets for BMF 32M can be found on page 858 and for BMF 305M on page 834.

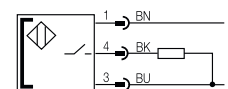
### Temperature load curve



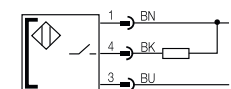
### Wiring diagrams

NO

PNP/connector



NPN/connector



# Magnetic Cylinder Sensors with Special Properties

## Rugged metal housing BMF 305M, BMF 32M



BMF 305M	BMF 305M	BMF 32M	BMF 32M
The robust all-rounder made of metal for position monitoring with M8 connector	The robust all-rounder made of metal for position monitoring with M12 connector	The robust specialist for metal housings with M8 direct connector	The robust specialist for metal housings with M12 direct connector
<b>BMF008F</b>	<b>BMF008E</b>	<b>BMF0088</b>	<b>BMF0087</b>
BMF 305M-PS-C-2-S49	BMF 305M-PS-C-2-S4	BMF 32M-PS-C-2-S49	BMF 32M-PS-C-2-S4
<b>BMF008C</b>		<b>BMF0086</b>	<b>BMF0085</b>
BMF 305M-NS-C-2-S49		BMF 32M-NS-C-2-S49	BMF 32M-NS-C-2-S4
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
75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA
30 mA	15 mA	15 mA	15 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
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 %	0.3 %	0.3 %	0.3 %
≤ 0.05 ms/≤ 0.05 ms	≤ 0.05 ms/≤ 0.05 ms	≤ 0.05 ms/≤ 0.05 ms	≤ 0.05 ms/≤ 0.05 ms
-25...+85 °C	-25...+85 °C	-25...+85 °C	-25...+85 °C
IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus
Aluminum	Aluminum	Aluminum	Aluminum
M8 connector, 3-pin	M12 connector, 4-pin	M8 connector, 3-pin Can be installed on cylinder with 60°- or 90°-trapezoidal slot or with mounting bracket	M12 connector, 4-pin Can be installed on cylinder with 60°- or 90°-trapezoidal slot or with mounting bracket



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

**Robust Metal Housing**

For the Food Industry

Weld-immune Electronics

Temperature-resistant up to 105 °C

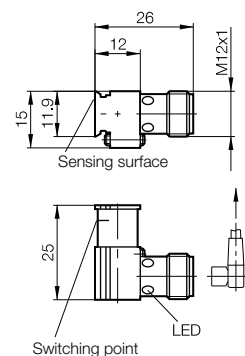
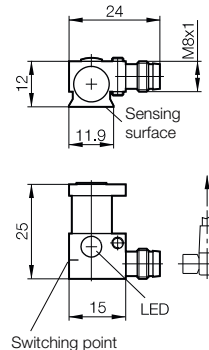
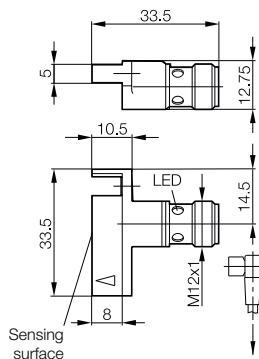
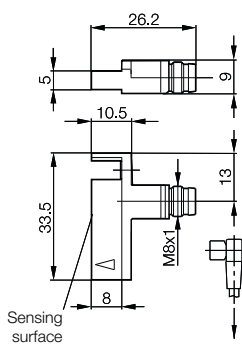
ATEX Cylinder Sensor

Reed Switches

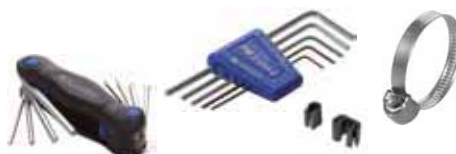
Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors



### Recommended accessories (please order separately)






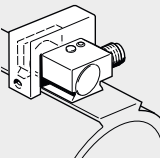
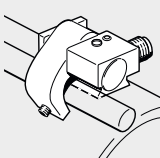
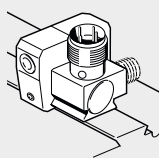
Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.

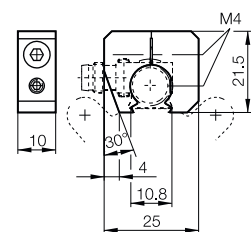
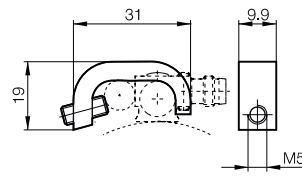
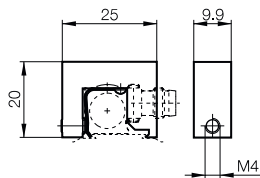


# Magnetic Cylinder Sensors with Special Properties

## Robust metal housing BMF 32M



Mounting bracket for Slot	<b>BMF 32M</b> 	<b>BMF 32M</b> 	<b>BMF 32M</b> 
<b>Ordering code</b>	<b>BAM00MR</b>	<b>BAM00MT</b>	<b>BAM00MU</b>
Part number	BMF 32-HW-12	BMF 32-HW-13	BMF 32-HW-14
Cylinder type	For pneumatic cylinders with a Bosch Rexroth trapezoidal rail of any piston diameter	For pneumatic cylinders with tie rod, any piston diameter, tie rod diameter max. 11 mm	For pneumatic cylinders with trapezoidal rail (Bosch) type: 0 822... ■ 350 ■ 351 ■ 352 ■ 353 ■ 354 ■ 355 Any piston diameter
Cylinder			



### Recommended accessories (please order separately)

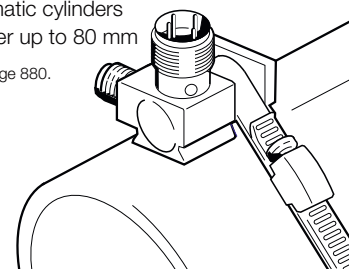
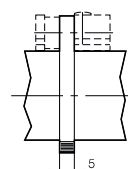
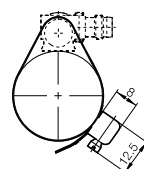


Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.

### Hose clamp BMF size 0...8

Made of stainless steel for pneumatic cylinders without tie rod/rail, piston diameter up to 80 mm

Please order hose clamp separately. See page 880.

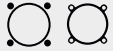


# Magnetic Cylinder Sensors with Special Properties

## Robust metal housing BMF 32M



### BMF 32M

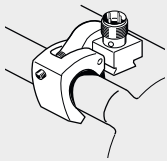


#### BAM00MW

BMF 32-HW-15

For pneumatic cylinders with tie rod, any piston diameter, tie rod diameter up to 17 mm

Pneumatic cylinder with tie rod integrated in the housing- (profile), any piston diameter, profile width up to 17 mm



### BMF 32M

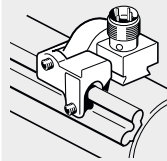


#### BAM00MY

BMF 32-HW-16

For pneumatic cylinders with tie rod, any piston diameter, tie rod diameter up to 6.5 mm

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



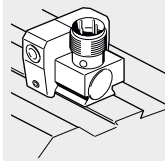
### BMF 32M



#### BAM00MZ

BMF 32-HW-18

For pneumatic cylinders with Bosch Rexroth trapezoidal rail Series 2700



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

#### Robust Metal Housing

For the Food Industry

Weld-immune Electronics

Temperature-resistant up to 105 °C

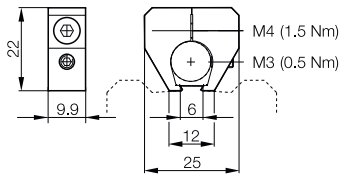
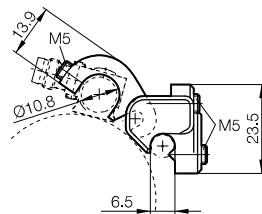
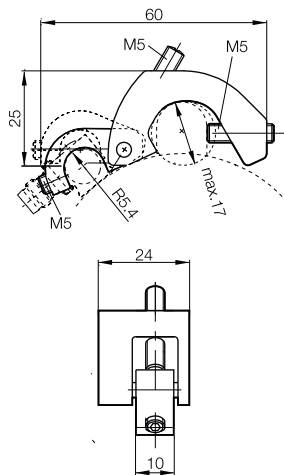
ATEX Cylinder Sensor

Reed Switches

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors



# Magnetic Cylinder Sensors with Special Properties

**With weld-immune electronics**  
**BMF32M, BMF 305M**

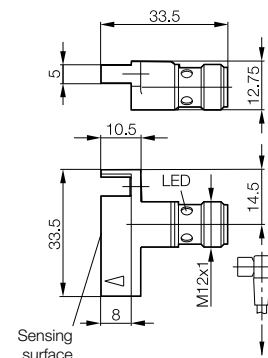
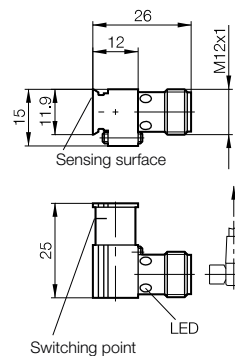
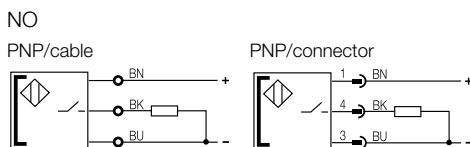
# Weld-immune Electronics



Model		<b>BMF 32M</b>	<b>BMF 305M</b>
Properties		The robust specialist for metal housings with M12 direct connector	The robust all-rounder made of metal for position monitoring with M12 connector
PNP, NO	<b>Ordering code</b>	<b>BMF008A</b>	<b>BMF0067</b>
	Part number	BMF 32M-PS- <b>W</b> -2-S4	BMF 305M-PS- <b>W</b> -2-S4
Supply voltage $U_S$		10...30 V DC	10...30 V DC
Voltage drop $U_d$		$\leq 4$ V	$\leq 4$ V
Rated insulation voltage $U_i$		75 V DC	75 V DC
Rated operating current $I_e$		200 mA	200 mA
No-load supply current $I_0$ max.		30 mA	30 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Rated switching field strength $I H_n$		1.2 kA/m	1.2 kA/m
Assured switching field strength $I H_a$		2 kA/m	2 kA/m
On/off delay		$\leq 50$ ms/ $\leq 50$ ms	$\leq 50$ ms/ $\leq 50$ ms
Ambient temperature $T_a$		-25...+70 °C	-25...+70 °C
Degree of protection as per IEC 60529		IP 67	IP 67
Approval		CE	CE, cULus
Material	Housing	Aluminum	Aluminum
Connection		M12 connector, 4-pin	M12 connector, 4-pin
Assembly		Can be installed on cylinder with 60° or 90°-trapezoidal slot or with mounting bracket	Installation with mounting bracket

Basic information and definitions can be found on page 976, associated mounting brackets for BMF 32M can be found on page 858; for BMF 305M and 305K see page 834.

## Wiring diagrams



## Suitable for AC welding environments

The series BMF 3...-W-.. are suitable for applications with extreme conditions. The metal housings are resistant to weld spatter. Applications with welding currents of over 25 kA do not impair the functionality of the sensor. The output state of the sensor is stored during AC welding.

# Magnetic Cylinder Sensors with Special Properties

With weld-immune electronics

**BMF315 M**



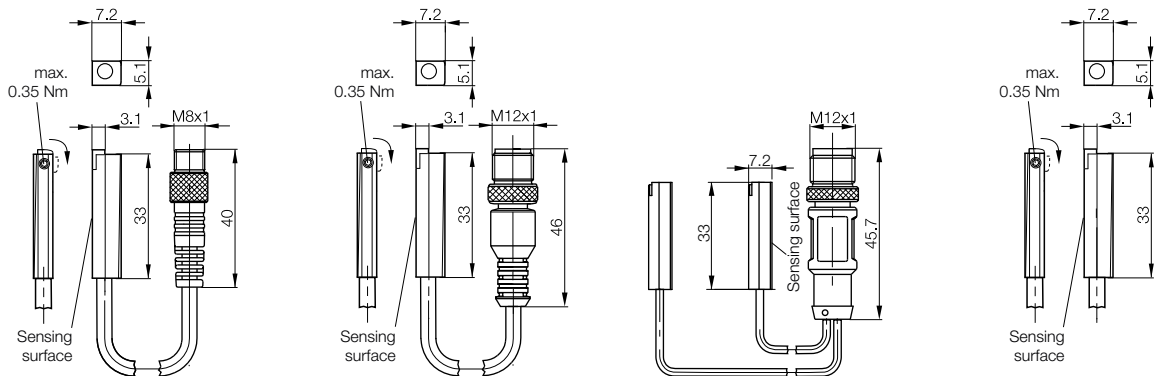
BMF 315M	BMF 315M	BMF 315M	BMF 315M
Made of metal for particularly demanding applications with an M8 connector	Made of metal for particularly demanding applications with an M12 connector	Made of metal for particularly demanding applications with an M12 connector	Made of metal for particularly demanding applications with a direct PUR cable
<b>BMF0082</b>	<b>BMF0081</b>	<b>BMF0084</b>	<b>BMF007Z</b>
BMF 315M-PS-W-2-S49-00,3	BMF 315M-PS-W-2-S4-00,3	BMF 315M-PS-W-2-SA95-S4-00,3	BMF 315M-PS-W-2-PU-02
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 4 V	≤ 4 V	≤ 4 V	≤ 4 V
75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA
20 mA	20 mA	20 mA	20 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
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
≤ 50 ms/≤ 50 ms	≤ 50 ms/≤ 50 ms	≤ 50 ms/≤ 50 ms	≤ 50 ms/≤ 50 ms
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
IP 67	IP 67	IP 67	IP 67
CE, cULus	CE, cULus	CE, cULus	CE, cULus
Aluminum	Aluminum	Aluminum	Aluminum
0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin	2 m PUR cable, 3x0.1 mm <sup>2</sup>
Can be installed in the T-slot from above	Can be installed in the T-slot from above	Can be installed in the T-slot from above	Can be installed in the T-slot from above



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design



Magnetic Cylinder Sensors with Special Properties

Robust Metal Housing

For the Food Industry

Weld-immune Electronics

Temperature-resistant up to 105 °C

ATEX Cylinder Sensor

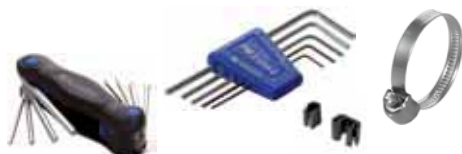
Reed Switches

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

## Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.

# Magnetic Cylinder Sensors with Special Properties

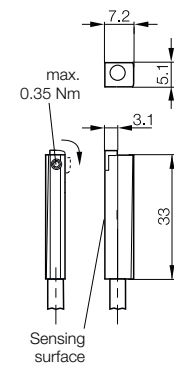
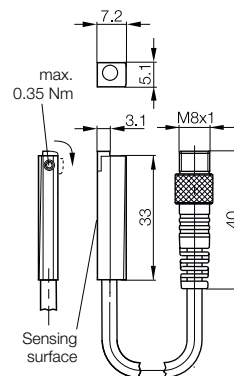
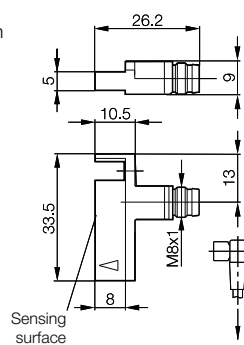
**High-temperature resistant up to 105 °C**  
**BMF 315M, 305M**

**105 °C**

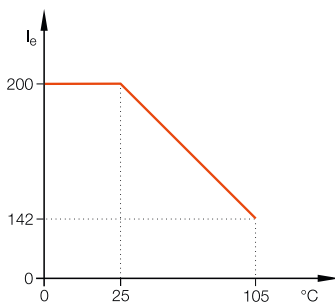


Model	<b>BMF 305M</b>	<b>BMF 315M</b>	<b>BMF 315M</b>
Properties	The all-rounder for position monitoring with M8 connector	For particularly demanding applications with an M8 connector	For particularly demanding applications with a direct PUR cable
PNP, NO	<b>Ordering code</b> <b>BMF0066</b>	<b>BMF007Y</b>	<b>BMF007U</b>
	Part number BMF 305M-PS-C-2-SA4-S49	BMF 315M-PS-D-2-SA3-S49-00,3	BMF 315M-PS-D-2-SA3-PU-02
Supply voltage $U_S$	10...30 V DC	10...30 V DC	10...30 V DC
Voltage drop $U_d$	$\leq 3.1$ V	$\leq 3.1$ V	$\leq 3.1$ V
Rated insulation voltage $U_i$	75 V DC	75 V DC	75 V DC
Rated operating current $I_e$	200 mA	200 mA	200 mA
No-load supply current $I_0$ max.	15 mA	15 mA	15 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
Rated switching field strength $I_{H_n}$	1.2 kA/m	1.2 kA/m	1.2 kA/m
Assured switching field strength $I_{H_a}$	2 kA/m	2 kA/m	2 kA/m
On/off delay	$\leq 0.05$ ms/ $\leq 0.05$ ms	$\leq 0.05$ ms/ $\leq 0.05$ ms	$\leq 0.05$ ms/ $\leq 0.05$ ms
Ambient temperature $T_a$	<b>-25...105 °C</b>	<b>-25...105 °C</b>	<b>-25...105 °C</b>
Degree of protection as per IEC 60529	IP 65	IP 67	IP 67
Approval	CE	CE, cULus	CE, cULus
Material	Aluminum	Aluminum	Aluminum
Housing			
Connection	M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3x0.1 mm <sup>2</sup>
Assembly	Installation with mounting bracket	Can be installed in the T-slot from above	Can be installed in the T-slot from above

Basic information and definitions can be found on page 976, associated mounting brackets for BMF 305M can be found on page 834.



## Temperature load curve

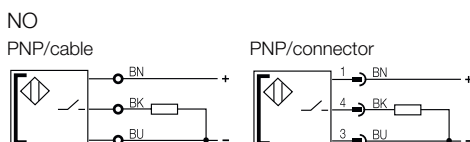


**Recommended accessories**  
(please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.

## Wiring diagrams



# Stainless Steel

## Magnetic Cylinder Sensors with Special Properties For the food industry BMF 10E

BMF 10E – developed for the higher demands of the food industry. Extremely robust due to its one-piece, stainless steel housing.

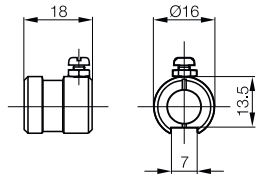


### Mounting bracket:

BMF 10E-HW-19 made of stainless steel 1.4571

**Ordering code: BAM00KR**

(please order separately)



Please order hose clamp separately. See page 880.

Model	<b>BMF 10E</b>	
Properties	The stainless steel sensor specially for the food industry	
PNP, NO	<b>Ordering code</b>	<b>BMF001Z</b>
	Part number	BMF 10E-PS-D-2-SA1-S49
Supply voltage $U_S$	10...30 V DC	
Voltage drop $U_d$	$\leq 3.1$ V	
Rated insulation voltage $U_i$	75 V DC	
Rated operating current $I_e$	200 mA	
No-load supply current $I_0$ max.	12 mA	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	
Rated switching field strength $ H_n $	1.2 kA/m	
Assured switching field strength $ H_a $	2 kA/m	
Hysteresis of $ H_n $	45 %	
Temperature drift of switch-on point of $ H_n $	0.3 %	
On/off delay	$\leq 0.05$ ms/ $\leq 0.05$ ms	
Ambient temperature $T_a$	-25...+70 °C	
Degree of protection as per IEC 60529	IP 68 and IP 69K	
Approval	CE	
Material	Housing	<b>Stainless steel 1.4571</b>
Connection	M8 connector, 3-pin	

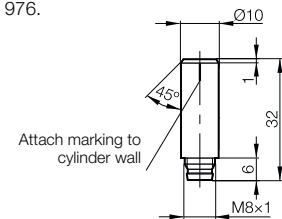


Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

Basic information and definitions can be found on page 976.



Magnetic Cylinder Sensors with Special Properties

Robust Metal Housing

**For the Food Industry**

Weld-immune Electronics

**Temperature-resistant up to 105 °C**

ATEX Cylinder Sensor

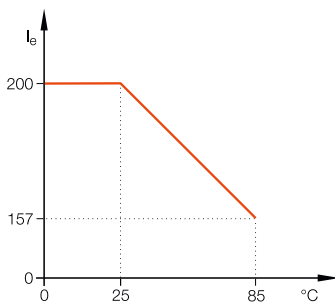
Reed Switches

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

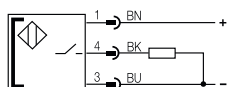
### Temperature load curve



### Wiring diagrams

NO

PNP/connector



## Magnetic Cylinder Sensors with Special Properties

### **ATEX cylinder sensor BMF 255**

Our magnetic cylinder sensors for the ATEX area are specially developed for areas with continuous, long-term, and frequently occurring dust, gases, and steam (Zone 0/20, category 1G/1D).

As usual, the sensors can be easily installed in T-slots; using corresponding mounting brackets they can also be installed on round and tie bar cylinders. With a 6-meter long self-configurable cable, you can quickly and easily connect the sensor to the correct isolating amplifier outside of the ATEX zone. Of course, you also get this isolating amplifier from us.

- Highest Ex protection with the category 1G/1D (Zone 0/20)
- Can be quickly and easily inserted into the T-slot from above, with clamping fixture
- Sensors, isolating amplifiers, and angle brackets, all from a single source
- 6-meter-long, user-fabricated cable



# Magnetic Cylinder Sensors with Special Properties

## ATEX cylinder sensor BMF 255



Description		BMF 255	Isolating amplifier
Namur, NO	<b>Ordering code</b>	<b>BMF00E4</b>	
	Part number	BMF 255K-N-06-EEX	
24 V DC	<b>Ordering code</b>		<b>FHW004P</b>
	Part number		STAHL 9170/20-12-11S
120...230 V AC	<b>Ordering code</b>		<b>FHW004R</b>
	Part number		STAHL 9170/20-12-21s
Rated operating voltage $U_o$		8.2 V DC	<p>The isolating amplifier with relay output serves as the interface between electrical signals from the hazardous area (Ex zone) and the non-hazardous area (safe zone).</p> <p>The input signals from ATEX sensors are converted using relay switching contacts at the outputs. Input, output, and auxiliary power circuits are securely galvanically isolated.</p> <p><b>See page 637 for more information.</b></p>
Supply voltage $U_S$ max.		15 V DC	
Internal inductance $L_i$ max.		400 $\mu$ H	
Internal capacitance $C_i$ max.		140 nF	
Power $P_i$ max.		120 mW	
Current consumption, damped, max.		2.2 mA	
Current consumption, undamped, min.		1 mA	
Responsiveness		2 mT	
Switching frequency $f$		2 kHz	
Function indicator		Yes	
Ambient temperature $T_a$		-25...+70 °C	
Degree of protection as per IEC 60529		IP 67	
<b>Approval</b>		<b>CE, BVS 11 ATEX E071, IECEX BVS 11.0043, Ex II 1G Ex ia IIC T4 Ga, Ex II 1D Ex ia IIIC T 135 °C Da</b>	
Material	Housing	PA	
	Sensing surface	PA	
	Clamping screw	Stainless steel	
Connection		6 m PVC cable, 2x0.14 mm <sup>2</sup>	
Assembly		Can be installed from above	
Slot		┘┘ T-slot	



Magnetic Cylinder Sensors

Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties

Robust Metal Housing

For the Food Industry

Weld-immune Electronics

Temperature-resistant up to 105 °C

**ATEX Cylinder Sensor**  
Reed Switches

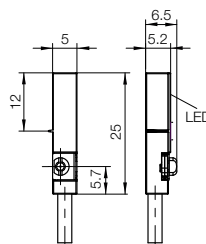
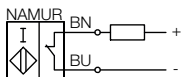
Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

Basic information and definitions can be found on page 976.

### Wiring diagram



### Angle bracket for round and tie bar cylinders



Part number	Cylinder profile	Part number
For round cylinders: BMF 307-HW-112 (BAM01Y9) with hose clamp BMF size 2 (BAM00N4)	Profile cylinder and tie rod up to 5...11 mm	BMF 235-HW-109 (BAM01M9)
	Profile cylinder and tie rod up to 9...15 mm	BMF 235-HW-110 (BAM01MA)
	Profile cylinder and tie rod 14...20 mm	BMF 235-HW-111 (BAM01MC)



# Magnetic Cylinder Sensors with Special Properties

## Reed-Schalter BMF 305K

# Reed



Model		<b>BMF 305K Reed</b>	<b>BMF 305K Reed</b>	<b>BMF 305K Reed</b>
Properties		The all-rounder for position monitoring as a reed switch	The all-rounder for position monitoring as a reed switch	The all-rounder for position monitoring as a reed switch
PNP, NO (DC)	<b>Ordering code</b>	<b>BMF0063</b>	<b>BMF0062</b>	
	Part number	BMF 305K-R-PS-F-3-S49-00,2	BMF 305K-R-PS-F-3-03	
NO (AC)/polarized, NO (DC)	<b>Ordering code</b>			<b>BMF0064</b>
	Part number			BMF 305K-R-US-L-3-03
Sensed medium		Magnetic field	Magnetic field	Magnetic field
Supply voltage $U_s$		10...30 V DC	10...30 V DC	6...240 V DC
Switching capacity max. reed contact		10 W	10 W	10 W
Rated operating current $I_o$		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/transposition protected/short-circuit protected		No/No/No	No/No/No	No/No/No
On/off delay		$\leq 0.7$ ms/ $\leq 0.7$ ms	$\leq 0.7$ ms/ $\leq 0.7$ ms	$\leq 0.7$ ms/ $\leq 0.7$ ms
Ambient temperature $T_a$		-20...+70 °C	-20...+70 °C	-20...+70 °C
Degree of protection as per IEC 60529		IP 65	IP 65	IP 65
Approval		CE	CE	CE, cULus
Material	Housing	LCP	LCP	LCP
Connection		0.2 m PUR cable with M8 connector, 3-pin	3 m PVC cable, 3x0.14 mm <sup>2</sup>	3 m PVC cable, 2x0.18 mm <sup>2</sup>
Assembly		Installation with mounting bracket	Installation with mounting bracket	Installation with mounting bracket

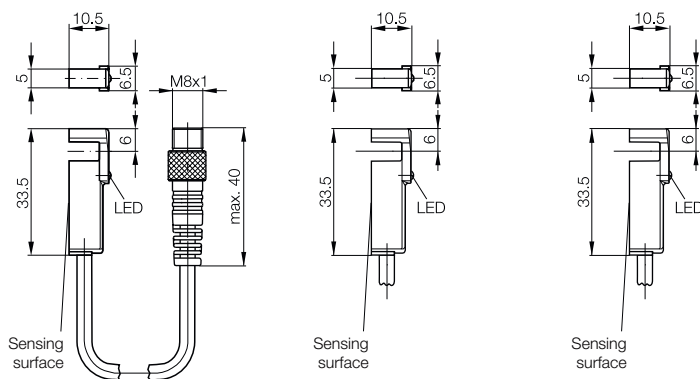
Basic information and definitions can be found on page 976, associated mounting brackets for BMF 305K can be found on page 834.

### Recommended short circuit protection equipment:

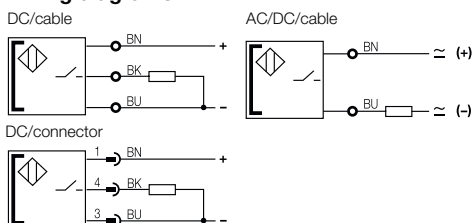
Miniature fuse in accordance with IEC60127-2 Sheet 1,  $\leq 2$  A (fast-acting). The fuse has to lie in the load current line. The fuse must not be routed into the output line.

The **reed switches BMF 305K-R-...** have an LED to indicate function and act as an adjustment 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 will be happy to give you advice.

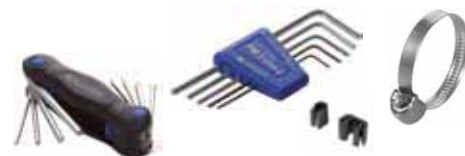
- Fast and easy to install
- Compatible with all common cylinder sizes using corresponding mounting brackets
- No loss of the switching point when replacing a switch



### Wiring diagrams



### + Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.

# Magnetic Cylinder Sensors with Special Properties

## Reed-Schalter BMF 307K



Model	BMF 307K Reed		BMF 307K Reed
Properties	The compact sensor for the T-slot as a reed switch		The compact sensor for the T-slot as a reed switch
PNP, NO (DC)	<b>Ordering code</b>		
	Part number		
NO (AC)/polarized, NO (DC)	<b>Ordering code</b>	<b>BMF0078</b>	<b>BMF008P</b>
	Part number	BMF 307K-R-AS-L-3-S49-00,2	BMF 307K-R-AS-L-3-03
Sensed medium	Magnetic field		Magnetic field
Supply voltage $U_S$	4...30 V AC/DC		4...30 V AC/DC
Switching capacity max. reed contact	10 W		10 W
Rated operating current $I_e$	128 mA at 24 V DC		128 mA at 24 V DC
Minimum operating current $I_m$	3 mA		3 mA
Polarity reversal protected/transposition protected/short-circuit protected	No/No/No		No/No/No
On/off delay	$\leq 0.7$ ms/ $\leq 0.2$ ms		$\leq 0.7$ ms/ $\leq 0.2$ ms
Ambient temperature $T_a$	$-20...+70$ °C		$-20...+70$ °C
Degree of protection as per IEC 60529	IP 65		IP 65
Approval	CE		CE
Material	Housing	LCP	LCP
Connection	0.2 m PUR cable with M8 connector, 3-pin		3 m PVC cable, 2x0.14 mm <sup>2</sup>
Assembly	Can be inserted from the side		Can be inserted from the side
Slot	$\approx 5$ T-slot		$\approx 5$ T-slot



Magnetic Cylinder Sensors  
Magnetic Cylinder Sensors with Mounting System

Magnetic Cylinder Sensors with a Compact Design

Magnetic Cylinder Sensors with Special Properties  
Robust Metal Housing  
For the Food Industry  
Weld-immune Electronics  
Temperature-resistant up to 105 °C  
ATEX Cylinder Sensor  
**Reed Switches**

Magnetic Sensors for Object Detection

Magneto-inductive Position Sensors for Analog Position Measurement

Accessories for Magnetic Cylinder Sensors

Basic information and definitions can be found on page 976.

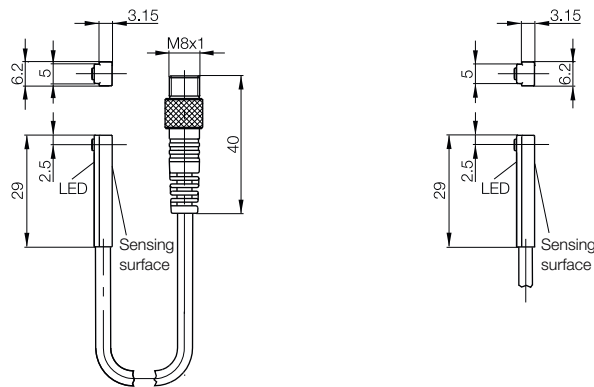
### Additional cable lengths on request.

### Recommended short circuit protection equipment:

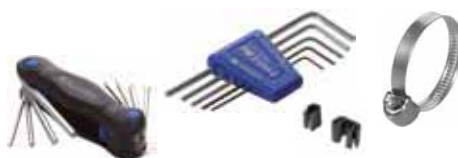
Miniature fuse in accordance with IEC60127-2 Sheet 1,  $\leq 2$  A (fast-acting). The fuse has to lie in the load current line. The fuse must not be routed into the output line.

The **reed switches BMF 307K-R-...** have an LED to indicate function and act as an adjustment 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 will be happy to give you advice.

Can be installed without mounting bracket in cylinders with T-slot, 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.



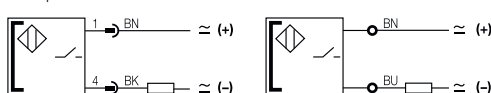
### Recommended accessories (please order separately)



Special accessories for magnetic cylinder sensors, such as **installation tools, cable clips, or hose clamps**, can be found in this catalog on page 878.

### Wiring diagrams

Example connectors



BU — Connect to ground on controller side!