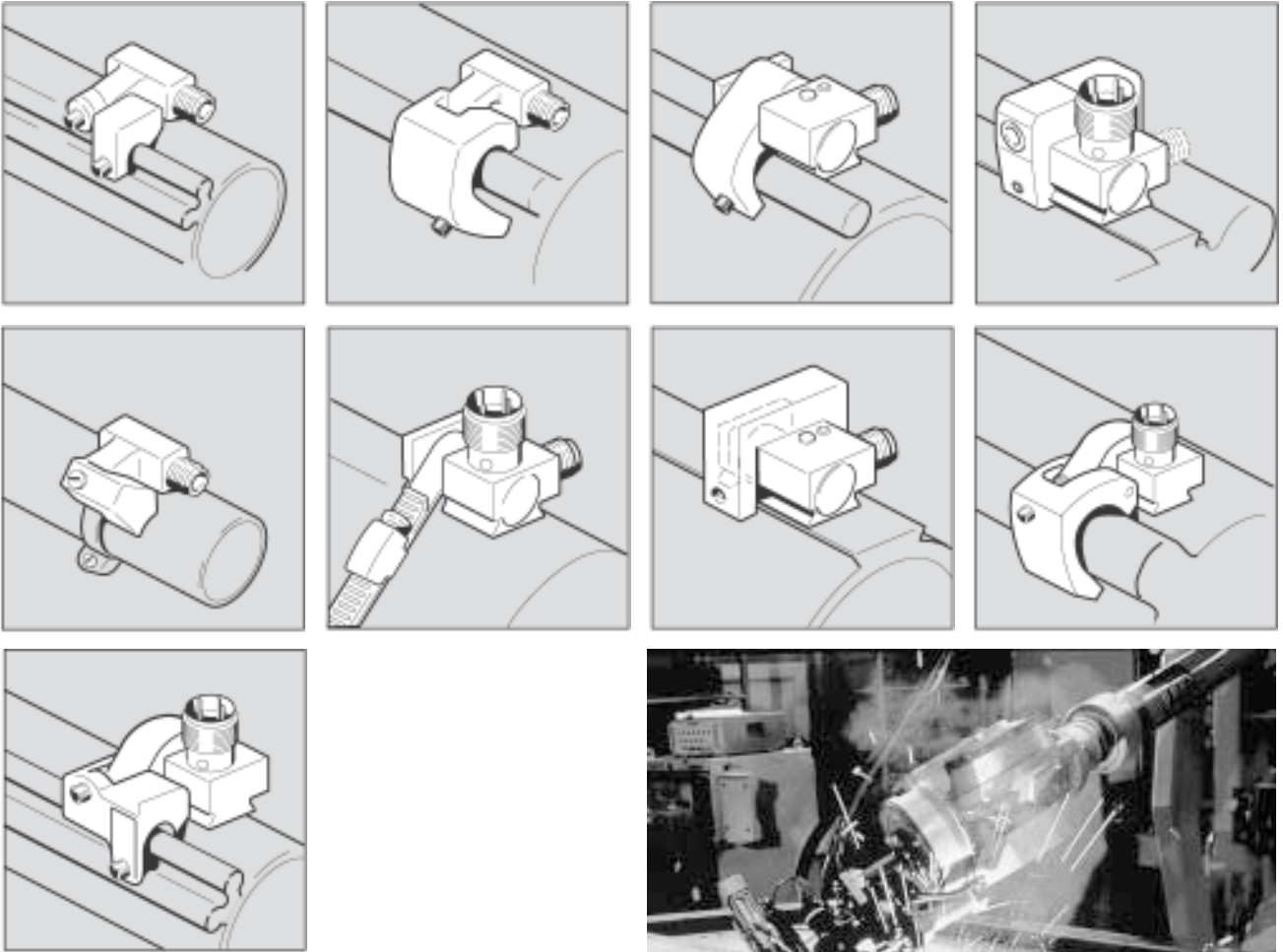


- Non-contact
- Wear-free
- Non-interfering
- Bounceless output signal
- Function indicator
- Switching independent of the polarization of the magnetic field
- No multiple switchpoints
- Compact housings
- Can be attached to any cylinder type

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

- 3.2** Applications
- 3.3** General description, principles of operation
- 3.4** BMF 303, BMF 305
- 3.5** BMF 305
- 3.6** BMF 305 Reed switches
- 3.7** Brackets selection guide and assembly for BMF 303
- 3.8** Brackets selection guide and assembly for BMF 305
- 3.12** BMF 307
- 3.13** BMF 21, BMF 32
- 3.14** Brackets for BMF 21
- 3.15** Brackets for BMF 32
- 3.16** Cylindrical housing \varnothing 6.5 mm
- 3.17** Cylindrical housings \varnothing 6.5 mm, \varnothing 10 mm, M8, M12
- 3.18** Installation notes
- 3.20** Selection guide connectors and cables



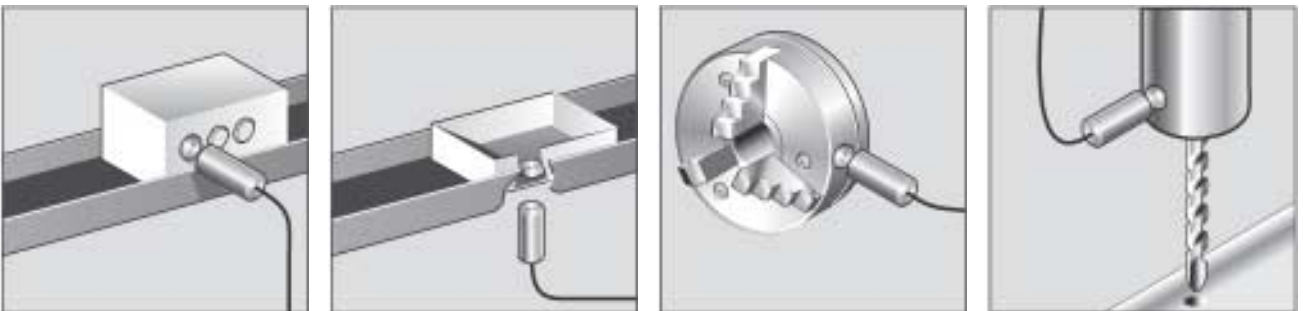


Detecting of piston position in pneumatic cylinders of all sizes.



Series BMF 305M/32M-..-**W**-.. appropriate to extreme applications. Their metal housing makes them resistant to weld splatter build up.

These sensors can be used in weld fields as strong as 25 kA without damage.



Identification of containers, pallets, etc.

Pallet position detection

Position sensing in cutting area of machine tools

Sensing rotary motion in drill presses for example

Use

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

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

The supply voltage is indicated by a green LED and the function by a yellow LED.

Mounting brackets are available for every model for installing on virtually any cylinder size and type.

Function

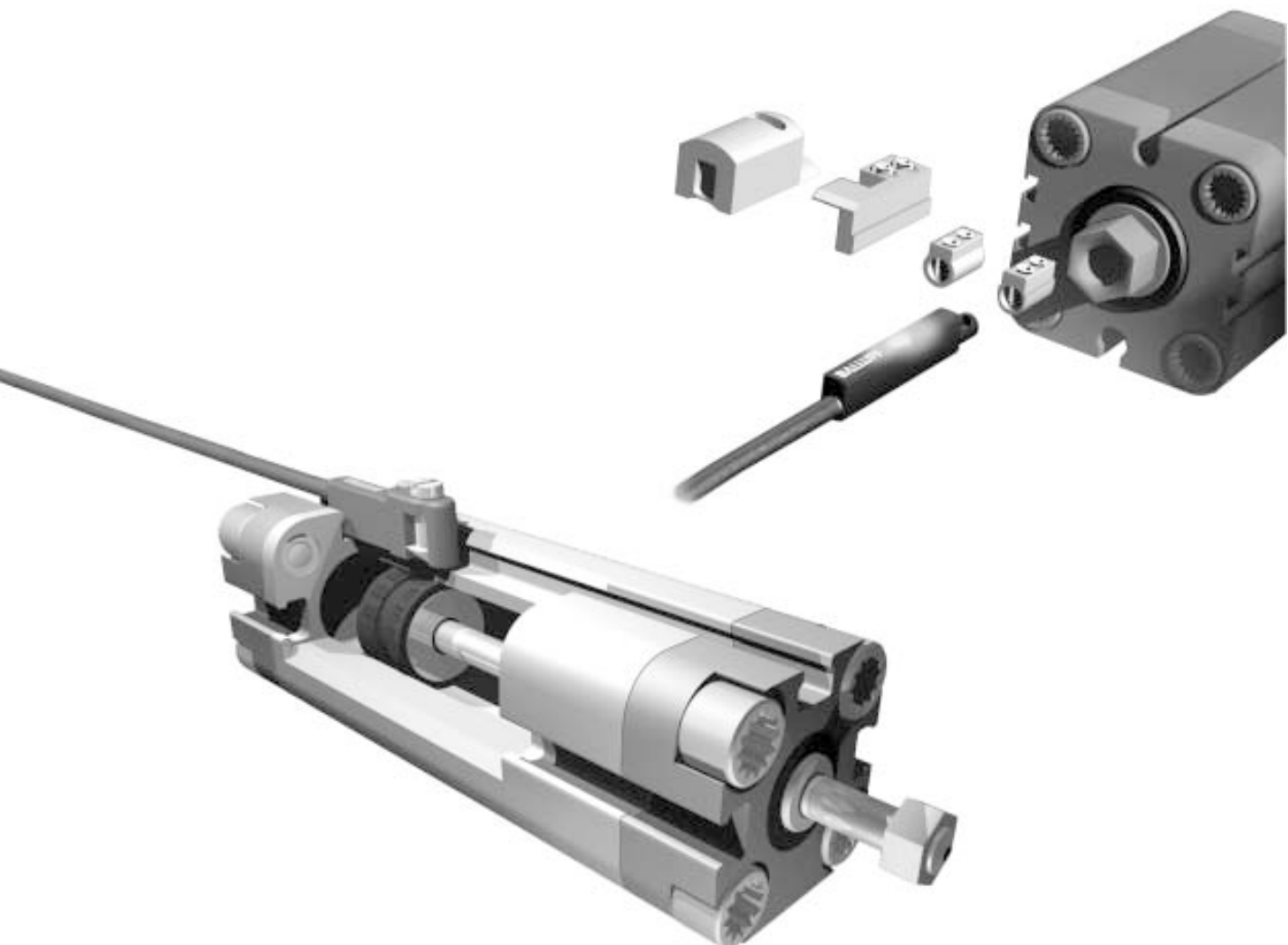
Permanent magnets are installed in the piston ring of the pneumatic cylinder which are sensed by the magnetic field sensor through the cylinder wall. As the piston approaches, the sensor changes its output signal state.

The BMF magnetic field sensor exhibits **no multiple switchpoints** on a cylinder at magnetic field strengths of approx. 2 kA/m to 30 kA/m. The sensing path within this magnetic field strength range is virtually constant.

Advantages

- Reliable, bounceless switching
- No double switchpoints
- Long service life
- Non-contact, wear-free piston sensing
- Insensitive to contamination
- Detects piston position through the cylinder wall
- Space-saving design, small sizes and shapes
- Can be installed on any cylinder using the appropriate bracket
- Significantly greater switching distances for the same size
- Switches through alloy and aluminum walls without a reduction in switching distance
- Responds only to magnetic fields; no spurious switching caused by chips

- Magnet can be flush mounted in steel
- Reverse polarity protected
- Supply voltage 10...30 V DC
- Responds to both magnetic field directions equally
- Semiconductor, wear-free
- Insensitive to vibration
- Output protected against inductive peaks
- Short circuit protected
- Housing material is highly resistant to aggressive media



Series
Version

BMF 303

BMF 303

BMF 303

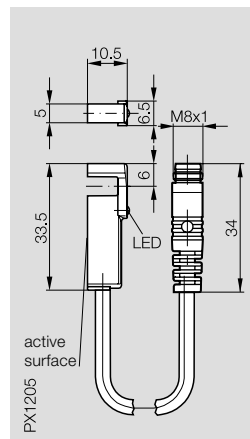
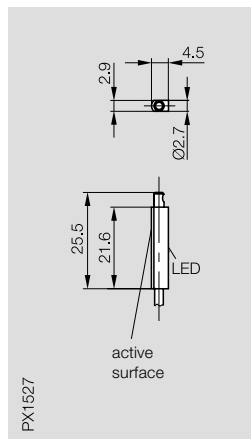
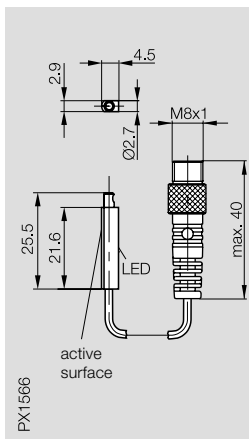
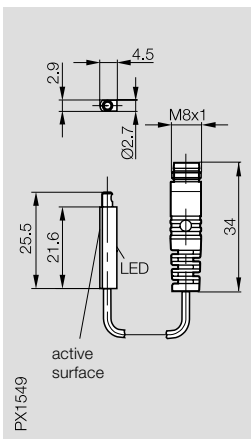
BMF 305

connector for direct connection to distribution box



Ordering as a set

Sensor and bracket:
Please include code for bracket in ordering code
e. g. BMF 303K/HW30-PS-C-2-PU-03
or BMF 305K/HW20-PS-C-2-PU-05
Magnetic field sensor and bracket in one part number.



PNP Normally-open

BMF 303K-PS-C-2-S49-

BMF 303K-PS-C-2-SA 2-S49-

BMF 303K-PS-C-2-

BMF 305K-PS-C-2-S49-

NPN Normally-open

BMF 305K-NS-C-2-S49-

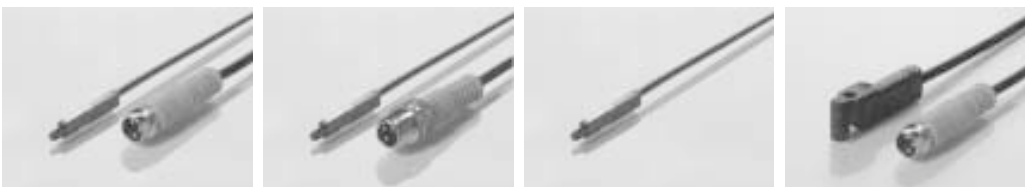
Rated operating field strength I_{H_n}
Assured operating field strength I_{H_a}
Hysteresis of I_{H_n}
Temperature drift of turn-on point of I_{H_n}

1.2 kA/m	1.2 kA/m	1.2 kA/m	1.2 kA/m
≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m
≤ 45 %	≤ 45 %	≤ 45 %	≤ 45 %
≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C

Supply voltage U_B
Voltage drop U_d
Rated insulation voltage U_i
Rated operational current I_e
No-load supply current I_0 max.
Off-state current I_r
Protected against polarity reversal
Short circuit protected
Load capacity
Ambient temperature range T_a
Utilization category
Degree of protection per IEC 60529
Housing material
Connection
No. of wires \times conductor cross section
Approval
Recommended connector

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
100 mA	100 mA	100 mA	200 mA
≤ 12 mA	≤ 12 mA	≤ 12 mA	≤ 30 mA
≤ 80 μ A	≤ 80 μ A	≤ 80 μ A	≤ 80 μ A
yes	yes	yes	yes
yes	yes	yes	yes
≤ 1 μ F	≤ 1 μ F	≤ 1 μ F	≤ 1 μ F
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
DC 13	DC 13	DC 13	DC 13
IP 67	IP 67	IP 67	IP 67
LCP	LCP	LCP	LCP
cable with connector	cable with connector	cable	cable with connector
cULus	cULus	3 \times 0,06 mm ² cULus	cULus
BKS-B 48			BKS-B 48

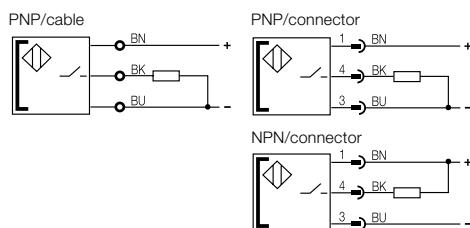
Connector orientation

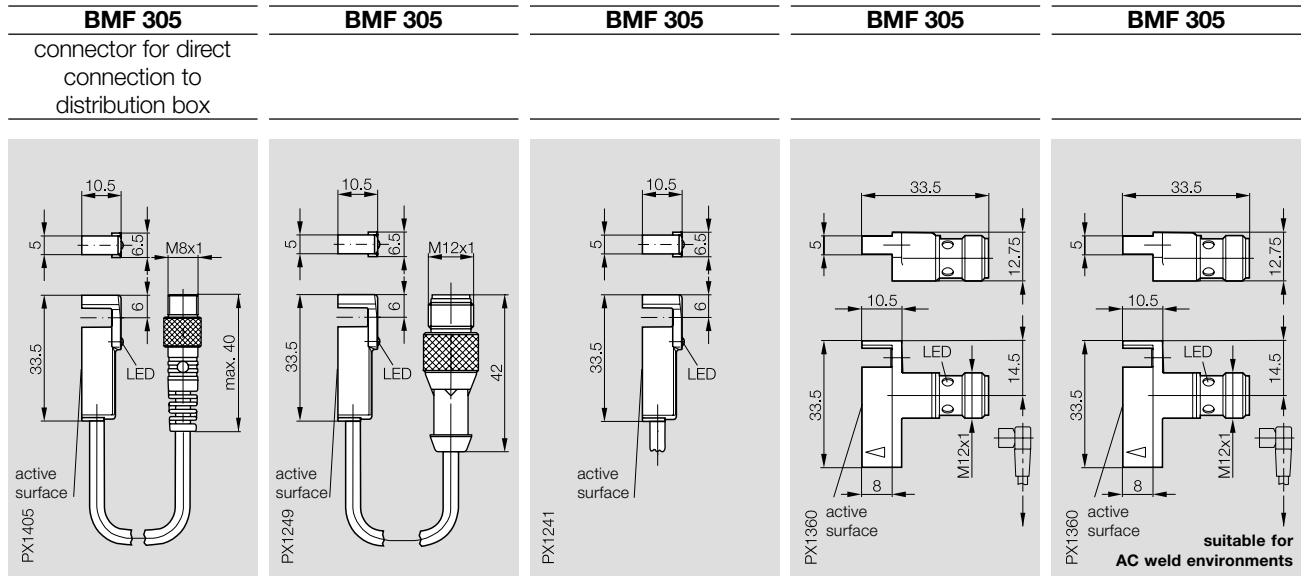


Please add the cable length to the ordering code for sensors with **cable!**
PU-03, PU-05 =
PUR, length 3 m or 5 m

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

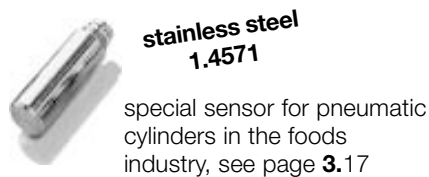
Wiring diagrams





BMF 305K-PS-C-2-SA 2-S49-	BMF 305K-PS-C-2-S 4-	BMF 305K-PS-C-2-	BMF 305M-PS-C-2-S 4	BMF 305M-PS-W-2-S 4
---------------------------	----------------------	------------------	---------------------	---------------------

1.2 kA/m	1.2 kA/m	1.2 kA/m	1.2 kA/m	1.2 kA/m
≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m	≥ 2 kA/m
≤ 45 %	≤ 45 %	≤ 45 %	≤ 45 %	≤ 45 %
≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C	≤ 0.3 %/°C
10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC	10...30 V DC
≤ 3.1 V	≤ 3.1 V	≤ 3.1 V	≤ 3.1 V	≤ 4 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
200 mA	200 mA	200 mA	200 mA	200 mA
≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA	≤ 30 mA
≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA	≤ 80 µA
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
≤ 1 µF	≤ 1 µF	≤ 1 µF	≤ 1 µF	≤ 1 µF
-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C	-25...+70 °C
DC 13	DC 13	DC 13	DC 13	DC 13
IP 67	IP 67	IP 67	IP 67	IP 67
LCP	LCP	LCP	Al	Al
cable with connector	cable with connector	cable	connector	connector
cULus	cULus BKS-B 19	cULus 3 × 0.14 mm ²	cULus BKS-B 19	cULus BKS-B 19



3

Brackets selection guide page 3.7 ...

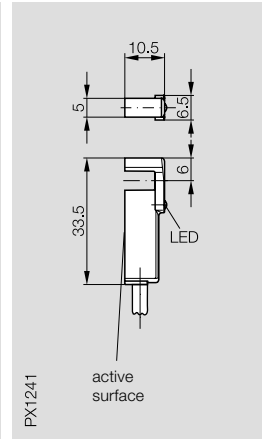
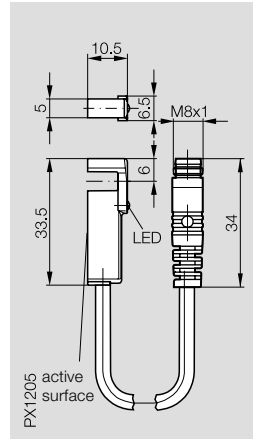
Connectors selection guide page 3.20 ...

6

Connectors ... page 6.2 ...



Series	BMF 305	BMF 305



Ordering as a set

Sensor and bracket:
Please include code for bracket
in ordering code
e. g. BMF 305K/**HW20**-R-PS-F-3-03
Magnetic field sensor and bracket
in one part number.

The BMF 305K-R reed switch has an LED for function display and as a setup aid. The recovery diode for switching an inductive load is already integrated.

For sensing the piston position in pneumatic cylinders you can choose between electronic and mechanical cylinder switches. Select whichever one fits your application. We'll be glad to help you.

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

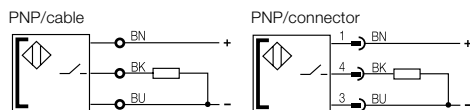
PNP	Normally-open	BMF 305K-R-PS-F-3-S49-	BMF 305K-R-PS-F-3-
Sensed medium		magnetic field	magnetic field
Supply voltage U_B		10...30 V DC	10...30 V DC
Rated operational current I_e		500 mA	500 mA
Load capacity		$\leq 0.5 \mu\text{F}$	$\leq 0.5 \mu\text{F}$
Ambient temperature range T_a		-20...+70 °C	-20...+70 °C
Utilization category		DC 13	DC 13
Degree of protection per IEC 60529		IP 65	IP 65
Housing material		LCP	LCP
Connection		cable with connector	cable
No. of wires x conductor cross section			3 x 0.14 mm ²
Recommended connector		BKS-B 48	

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

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



Wiring diagrams



BMF 303-HW-28/30

BMF 303-HW-33

BMF 303-HW-34



Advantages

Sensor disappears in the slot!



Adjust switchpoint in seconds! Turn screw one revolution, adjust position, tighten.



Switchpoint can't be lost. Even if you replace the sensor, the adjusted switchpoint is retained by the bracket.



Ordering code

Advantages

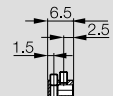
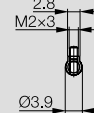
Cylinder slot

Bracket

BMF 303-HW-28



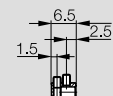
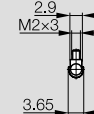
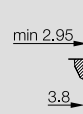
C-slot
e. g. SMC



BMF 303-HW-30



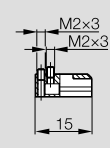
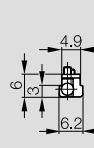
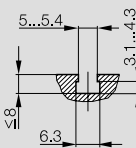
C-slot
Festo slot-10



BMF 303-HW-33



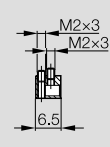
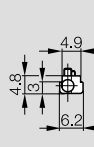
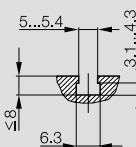
T-slot
e. g. Festo, Bosch, SMC



BMF 303-HW-40



T-slot
e. g. Festo, Bosch, SMC



Tube cuffs

for BMF 303-HW-34

Piston-Ø	Tube cuff size
< 8	0
8...16	1
20, 25	2
32	3
40	4
50	5
63	6
80	7

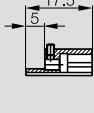
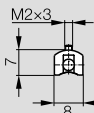
Tube cuff size _
please order separately

BMF 303-HW-34



no slot

round cylinder
diameter
< 8...80 mm



3

Brackets selection guide page 3.7 ...

Connectors selection guide page 3.20 ...

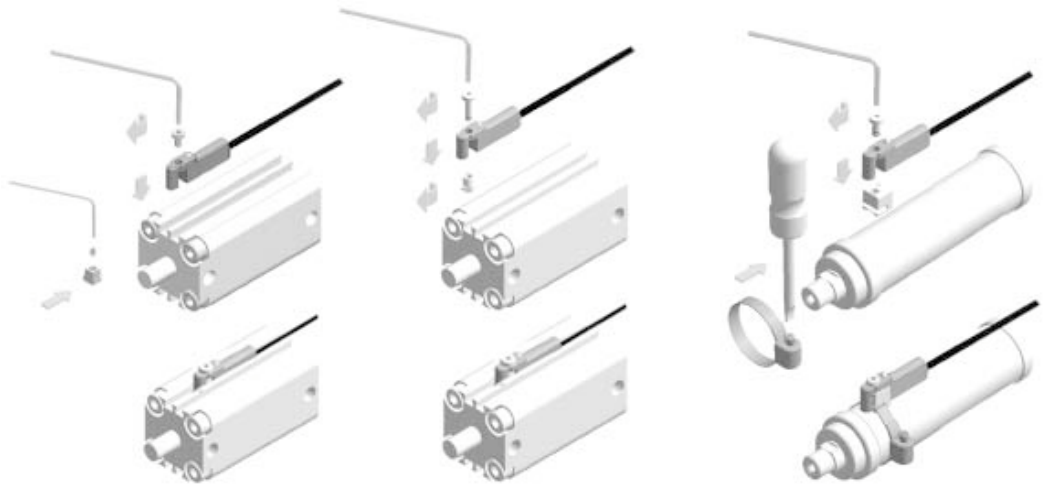
6

Connectors ... page 6.2 ...

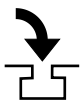
BMF 305-HW-20

BMF 305-HW-23

BMF 305-HW-24



Advantages



Can be inserted into slot from above. Anytime! Even later! Fast! Time-saving!



Adjust switchpoint in seconds! Turn screw one revolution, adjust position, tighten.



Switchpoint can't be lost. Even if you replace the sensor, the adjusted switchpoint is retained by the bracket.

Ordering code

Advantages

Cylinder slot

Bracket

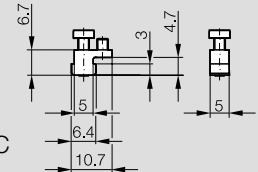
BMF 305-HW-17



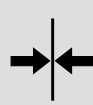
T-slot



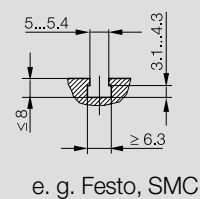
e. g. Festo, SMC



BMF 305-HW-20

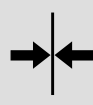


T-slot

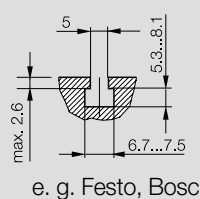


e. g. Festo, SMC

BMF 305-HW-22

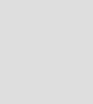


T-slot

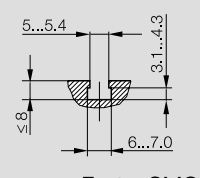


e. g. Festo, Bosch

BMF 305-HW-23

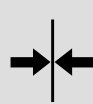


T-slot



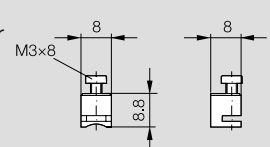
e. g. Festo, SMC

BMF 305-HW-24



no slot

round cylinder diameter <math>< 8 \dots 80 \text{ mm}</math>

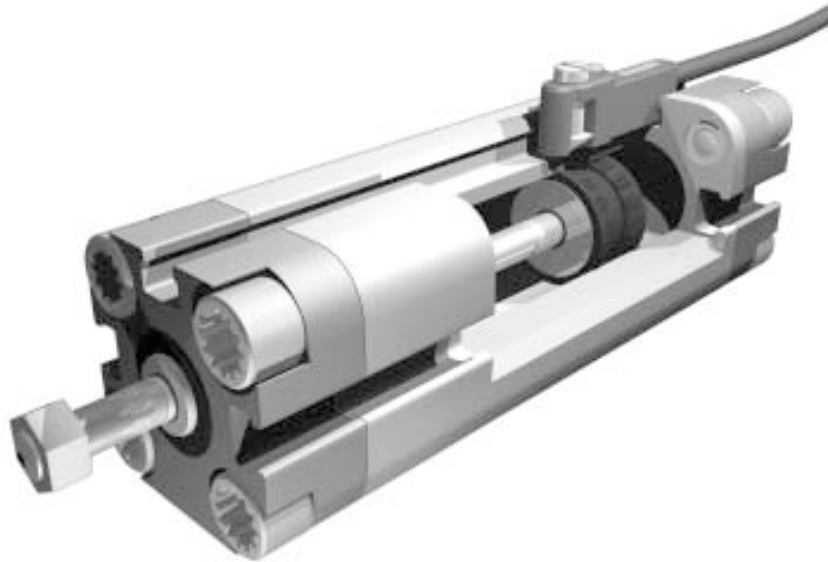


Tube cuffs for BMF 305-HW-24

Piston \varnothing	Tube cuff size
≤ 8	0
8...16	1
20, 25	2
32	3
40	4
50	5
63	6
80	7

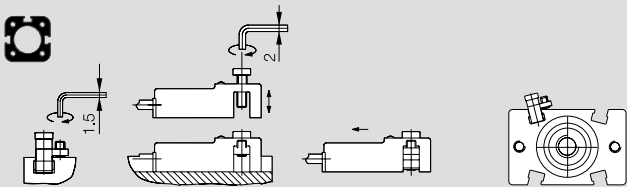
Tube cuff size _
please order separately





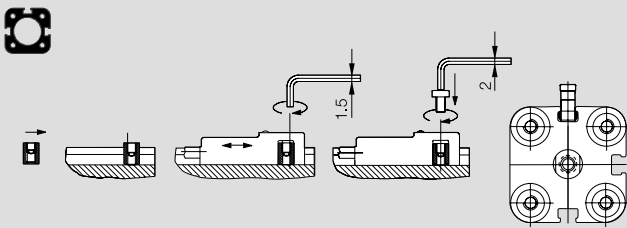
Installation

Included



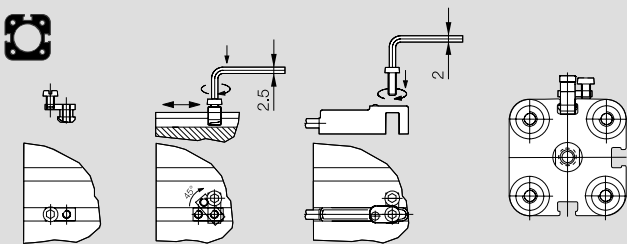
1. Insert bracket into slot from head end
2. Insert sensor from above and tighten
3. Position sensor, tighten bracket

Setscrew DIN 916 M3×5-A2
Screw DIN 7984 M3×10-A2
Bracket



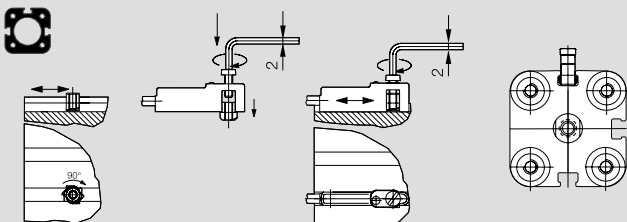
1. Insert bracket into slot from head end
2. Insert sensor from above, position and tighten bracket
3. Tighten down sensor with bracket

Setscrew DIN 916 M3×4-A2
Screw ISO 1207 M3×6-A2
Bracket
also:
Screw DIN 7984 M3×6-A2



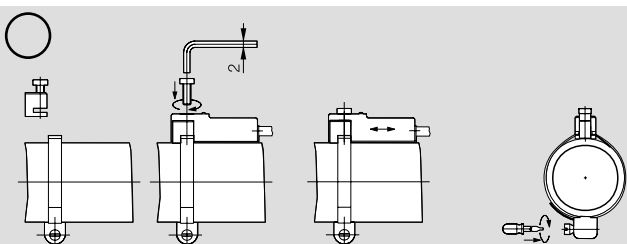
1. Insert bracket into slot from above, rotate 90°
2. Insert sensor from above and tighten
3. Position sensor, tighten bracket

Screw DIN 912 M3×4-A2
Screw DIN 7984 M3×8-A2
Bracket
also:
Screw ISO 1207 M3×4-A2
Screw ISO 1207 M3×8-A2



1. Attach bracket to sensor with 1 to 2 turns
2. Insert sensor and bracket from above and tighten (bracket rotates by 90°)

Screw DIN 7984-KL M3×10-A2
Bracket
also:
Screw ISO 1207-KL M3×10-A2

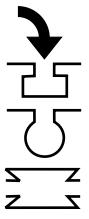


1. Place tube cuff on loosely
2. Attach sensor with bracket to tube cuff
3. Position and tighten

Screw DIN 7984 M3×8-A2
Bracket

Tube cuff size _ please order separately (see table at left)

Advantages



Can be inserted into slot from above. Anytime! Even later! Fast! Time-saving!



Adjust switchpoint in seconds! Turn screw one revolution, adjust position, tighten.



Switchpoint can't be lost. Even if you replace the sensor, the adjusted switchpoint is retained by the bracket.

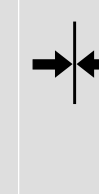
Ordering code

Advantages

Cylinder slot

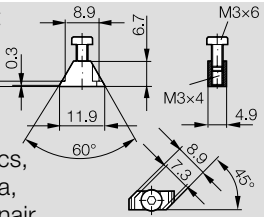
Bracket

BMF 305-HW-25

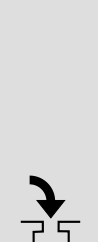


trapezoidal slot
60°/90°

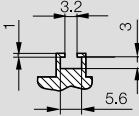
e. g. Festo,
Bosch, Numatics,
Hoerbiger-Origa,
Norgren-Martonair



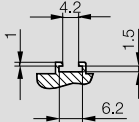
BMF 305-HW-26



T-slot **A**

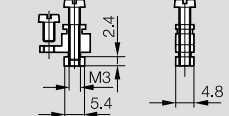


T-slot **B**

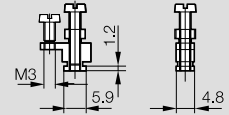


e.g. SMC

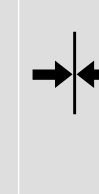
position for T-slot **A**



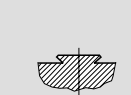
position for T-slot **B**



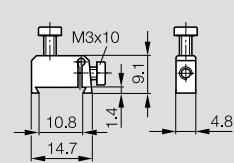
BMF 305-HW-27



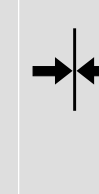
trapezoidal guide



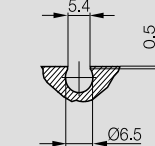
e. g. Bosch



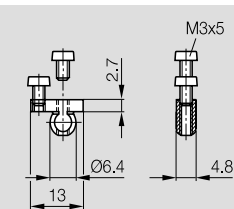
BMF 305-HW-32



C-slot



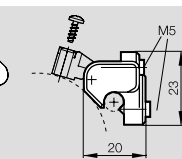
e. g. Norgren



BMF 305-HW-21 together with BMF 21-HW-8



BMF 305-HW-21

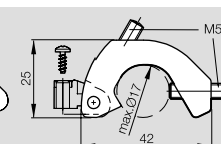


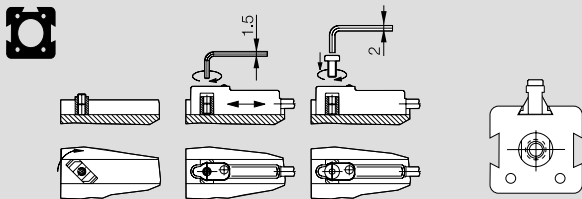
BMF 21-HW-8

BMF 305-HW-21 together with BMF 21-HW-10



BMF 305-HW-21



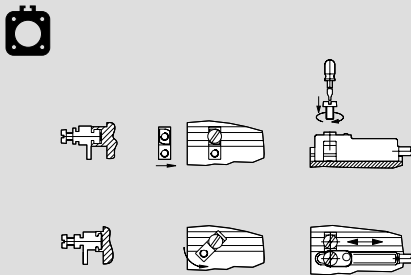


Installation

1. Insert bracket from above and rotate 90°
2. Insert sensor, position, tighten bracket
3. Tighten down sensor with bracket

Included

Setscrew DIN 916 M3×4-A2
Screw DIN 7984 M3×6-A2
Bracket

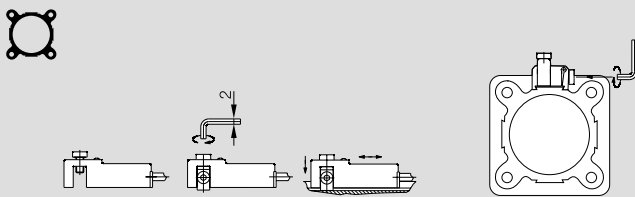


The bracket can be used for two slot dimensions.

T-slot **A**: insert bracket, insert sensor from above, position and tighten both screws.

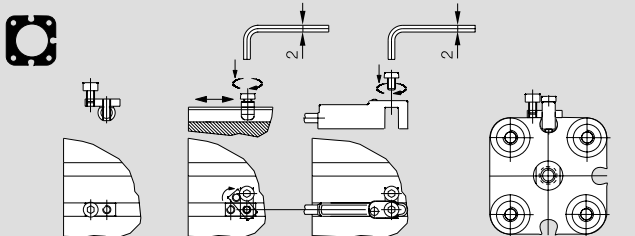
T-slot **B**: insert bracket from above and rotate 90°. Insert sensor from above, position and tighten both screws.

Cheese head screw ISO 1207 M3×5 A2
Cheese head screw ISO 1207 M3×14 A2
Bracket



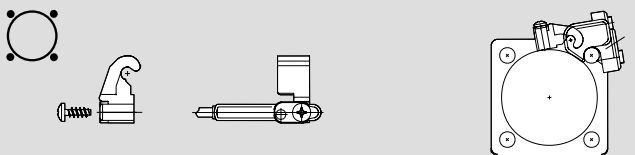
1. Insert bracket from above
2. Insert sensor from above and tighten
3. Position sensor, tighten bracket

Screw DIN 912 M3×4-A2
Screw DIN 7984 M3×10-A2
Bracket



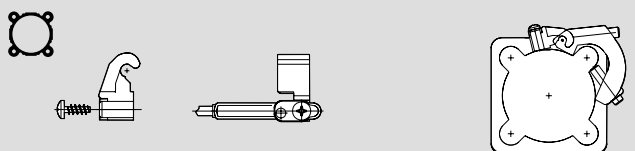
1. Insert bracket from above and rotate 90°
2. Insert sensor, position, tighten bracket
3. Tighten down sensor with bracket

Screws DIN 7984 M3×5-A2
Bracket



BMF 305-HW-21 together with BMF 21-HW-8 for installation on a tie rod cylinder

PT-screw KBL 30x8-A2
Bracket BMF 305-HW-21 (bracket BMF 21-HW-8 please order separately)



BMF 305-HW-21 together with BMF 21-HW-10 for installation on an profile cylinder

PT-screw KBL 30x8-A2
Bracket BMF 305-HW-21 (bracket BMF 21-HW-10 please order separately)