

## Profile Series PF

### General data

**Flat! 20 mm with free or captive magnet**

The structural design, high degree of protection and simple installation of Balluff Micropulse transducers in a profiled housing makes them an excellent alternative to linear transducers, e.g. potentiometers, glass rulers and LVDTs. The linear sensing element is protected inside an extruded aluminum profile.

A passive magnet with no power supply marks the measuring point along the waveguide without making contact. Measuring ranges between 50 and 4572 mm are possible.

- Non-contact detection of the actual position
- IP 67, insensitive to contamination
- Wear-free
- Insensitive to shock and vibration
- Absolute output signal
- Max. resolution of 0.005 mm (depending on the processing electronics)
- Direct signal processing or in conjunction with processors for all control and regulating systems



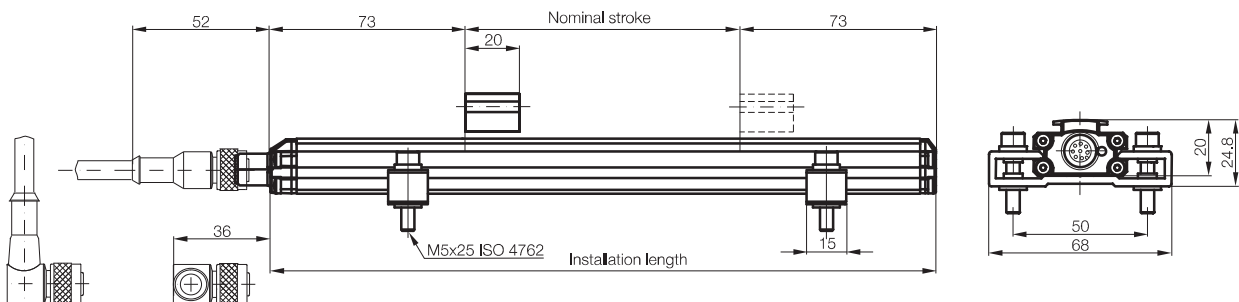
# Profile Series PF

## General data

Series	BTL6 profile PF
Shock load	50 g/6 ms per IEC 60068-2-27
Vibration	12 g, 10...2000 Hz per IEC 60068-2-6
Polarity reversal protected	Yes (up to 36 V)
Overvoltage protection	to 36 V
Dielectric strength	500 VDC (GND to housing)
Degree of protection as per IEC 60529	IP 67 (with BKS-S... IP 67 connector attached)
Housing material	Anodized aluminum
Housing attachment	Compression clamps
Connection type	Connectors
EMC testing:	
RF emission	EN 55016-2-3 Group 1, Class A and B
Static electricity (ESD)	IEC 61000-4-2 Severity Level 3
Electromagnetic fields (RFI)	IEC 61000-4-3 Severity Level 3
Fast transients (BURST)	IEC 61000-4-4 Severity Level 3
Surge voltage	IEC 61000-4-5 Severity Level 2
Conducted interference induced by high-frequency fields	IEC 61000-4-6 Severity Level 3
Magnetic fields	IEC 61000-4-8 Severity Level 4
Standard nominal strokes [mm]	0050, 0100, 0130, 0150, 0175, 0200, 0225, 0250, 0300, 0350, 0360, 0400, 0450, 0500, 0550, 0600, 0650, 0700, 0750, 0800, 0850, 0900, 0950, 1000, 1100, 1200, 1250, 1300, 1400, 1500, 1600, 1700, 1750, 1800, 1900, 2000, 2250, 2500, 2750, 3000, 3250, 3500, 3550, 3750, 4000, 4250, 4500, 4572

**P**  
General data  
Analog interface  
Digital pulse interface  
SSI interface  
CANopen interface  
DeviceNet interface  
PROFIBUS-DP interface  
Magnets floating  
Magnets captive, control arm

### Transducers with floating magnet and S115 connection with BKS-S115/BKS-S116 connector for transducers with analog interface, page 50



**PF**  
General data  
Analog interface  
Magnets floating  
Magnets captive, control arm

**AT**  
General data  
Analog interface  
Modes  
Digital pulse interface  
VARAN bus interface  
Accessories

**BIW**  
General data  
Analog interface



- Included:
- Transducer (select your interface from page 50)
  - Short user's guide
  - Mounting clamps with isolation washers and screws

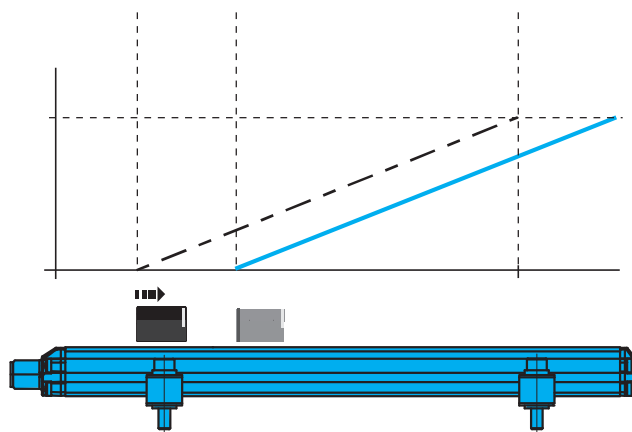
Please order separately:  
Magnets from page 52  
Connectors, page 156

### Output and measuring range setting

The measuring range and the output signal can be adapted to the relevant application requirements via programming inputs. In teach-in mode with inversion or reset function.

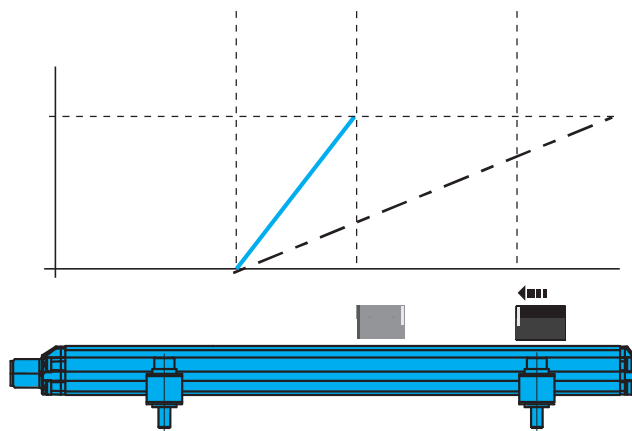
### Measuring range adjustment via programming inputs $L_a$ and $L_b$

1. Place magnet in new start position.



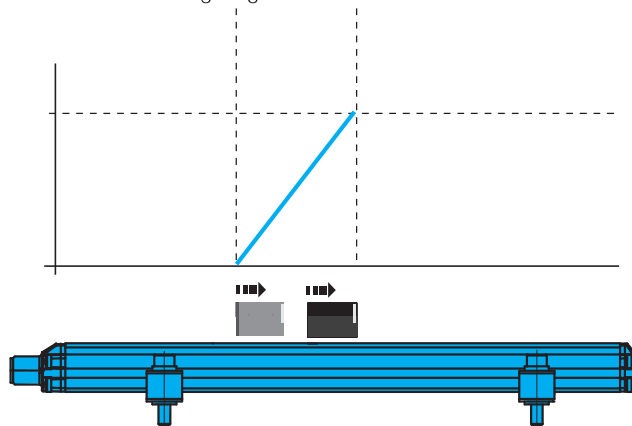
Adopting a new start position

2. Place magnet at new end position.



Adopting a new end position

3. The new measuring range



Series		
Output signal		
Transducer interface		
Input interface		
Part number		
Output voltage*		
Output current*		
Load current		
max. ripple		
Load resistance (recommended)		
System resolution		
Sampling rate		
max. non-linearity		
Temperature coefficient		
Operating voltage		
Current consumption		
Operating temperature		
Storage temperature range		
Pin assignments	Pin	Color
Output signals	1	YE
	2	GY
	3	PK
	4	RD
	5	GN
	8	WH
Operating voltage	6	BU
	7	BN

■ Please enter the code for the output signal and the nominal stroke in the ordering code!

Preferred models interface A500 and E500

BTL6-A500-M\_\_\_\_-PF-S115

BTL6-E500-M\_\_\_\_-PF-S115

are available from stock in the nominal lengths highlighted in blue.

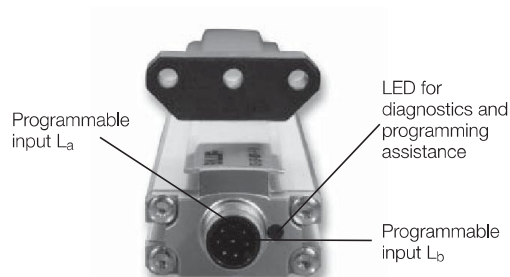
■ Included:

- Transducer
- Mounting clamps with isolation washers and screws
- Short user's guide

Please order separately:

Magnets from page 52

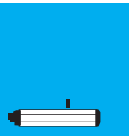
Connectors, page 156



# Profile Series PF

## Analog interface

BTL6 profile PF	BTL6 profile PF	BTL6 profile PF	BTL6 profile PF
analog	analog	analog	analog
<b>A</b>	<b>E</b>	<b>C</b>	<b>G</b>
analog	analog	analog	analog
BTL6-A500-M____-PF-S115	BTL6-E500-M____-PF-S115	BTL6-C500-M____-PF-S115	BTL6-G500-M____-PF-S115
0...10 V	4...20 mA	0.1...20 mA	-10...10 V
max. 5 mA			max. 5 mA
≤ 5 mV			≤ 5 mV
≤ 0,35 mV	≤ 500 ohms (500 ohms)	≤ 500 ohms (500 ohms)	≤ 0,35 mV
f <sub>max</sub> = 2 kHz	≤ 0,7 µA	≤ 0,7 µA	f <sub>max</sub> = 2 kHz
±200 µm up to 500 mm nominal stroke	f <sub>max</sub> = 2 kHz	f <sub>max</sub> = 2 kHz	±200 µm up to 500 mm nominal stroke
±0,04 % 500... max. nominal stroke	±200 µm up to 500 mm nominal stroke	±200 µm up to 500 mm nominal stroke	±0,04 % 500... max. nominal stroke
30 ppm at 500 mm	±0,04 % 500... max. nominal stroke	±0,04 % 500... max. nominal stroke	30 ppm at 500 mm
10...30 V DC	30 ppm at 500 mm	30 ppm at 500 mm	10...30 V DC
≤ 150 mA	10...30 V DC	10...30 V DC	≤ 150 mA
-25...+70 °C	≤ 150 mA	≤ 150 mA	-25...+70 °C
-40...+100 °C	-25...+70 °C	-25...+70 °C	-40...+100 °C
BTL6-A500...	-40...+100 °C	-40...+100 °C	BTL6-G500...
0 V	BTL6-E500...	BTL6-C500...	0 V
0 V Output	0 V	0 V	0 V Output
	0 V Output	0 V Output	
L <sub>a</sub> (programming input)			L <sub>a</sub> (programming input)
0...10 V	L <sub>a</sub> (programming input)	L <sub>a</sub> (programming input)	-10...10 V
L <sub>b</sub> (programming input)	4...20 mA	0.1...20 mA	L <sub>b</sub> (programming input)
GND	L <sub>b</sub> (programming input)	L <sub>b</sub> (programming input)	GND
10...30 V	GND	GND	10...30 V

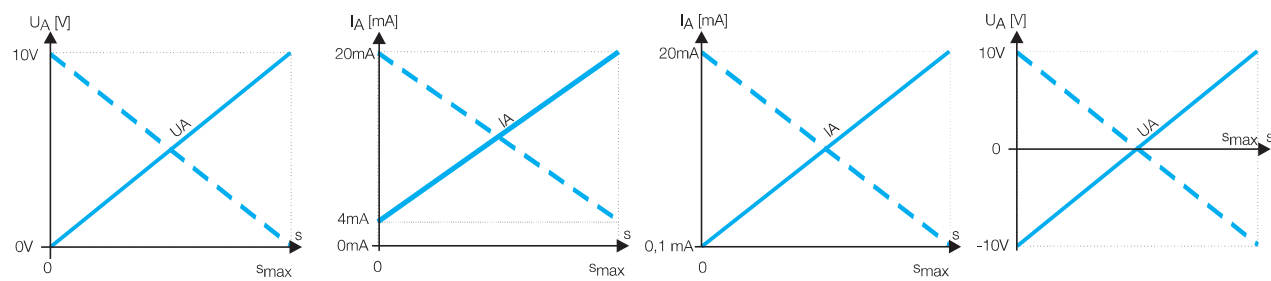


- P
- General data
- Analog interface
- Digital pulse interface
- SSI interface
- CANopen interface
- DeviceNet interface
- PROFIBUS-DP interface
- Magnets floating
- Magnets captive, control arm

- PF
- General data
- Analog interface
- Magnets floating
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- AT
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- Modes
- Digital pulse interface
- VARAN bus interface
- Accessories

- BIW
- General data
- Analog interface



\* — — — — — Output signal can be inverted via programming inputs.

### Ordering example:

BTL6-500-M\_\_\_\_-PF-S115



A	0...10 V	0050, 0100, 0130, 0150, 0175, 0200,
E	4...20 mA	0225, 0250, 0300, 0350, 0360, 0400,
C	0.1...20 mA	0450, 0500, 0550, 0600, 0650, 0700,
G	-10...10 V	0750, 0800, 0850, 0900, 0950, 1000,
		1100, 1200, 1250, 1300, 1400, 1500,
		1600, 1700, 1750, 1800, 1900, 2000,
		2250, 2500, 2750, 3000, 3250, 3500,
		3550, 3750, 4000, 4250, 4572

# Profile Series PF

Magnets floating

# Non-contact!

# Vertical offset

# 0.1...4 mm or 5...15 mm

Balluff magnets are available in captive or floating designs. Maximum resolution and repeatability are achieved using transducers with captive magnets.

The BTL5-P-4500-1 is an electromagnet and requires an operating voltage of 24V, which can be turned on and off for selective activation. This allows multiplex operation with multiple magnets on a single transducer, since only one magnet is active at a time.

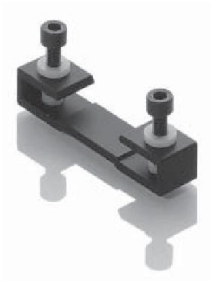
Description	
for series	
Version	
Part number	
Housing material	
Weight	
Magnet traverse velocity	
Operating voltage	
Current consumption	
Operating temperature/Storage temperature range	
Included	
Accessories (please order separately)	



Length			Number of mounting clamp pairs
	to	250 mm	1
251	to	750 mm	2
751	to	1250 mm	3
1251	to	1750 mm	4
1751	to	2250 mm	5
2251	to	2750 mm	6
2751	to	3250 mm	7
3251	to	3750 mm	8
3751	to	4250 mm	9
	more than	4251 mm	10

Mounting clamps with isolation washers and screws included with transducer.

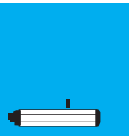
BTL6-A-MF07-A-PF/M5 1 pair of replacement mounting clamps and screws, item no.: 180961



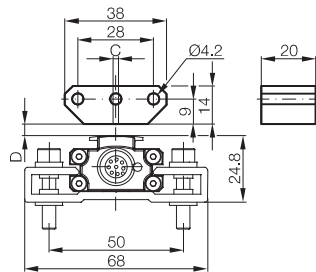
# Profile Series PF

## Magnets floating

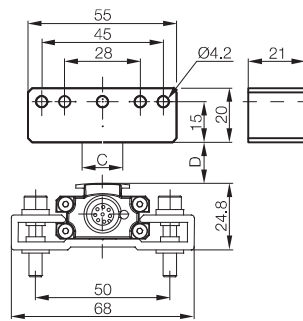
Magnet	Magnet	Magnet
BTL6 profile PF	BTL6 profile PF	BTL6 profile PF
floating	floating	floating
<b>BTL5-P-3800-2</b>	<b>BTL5-P-5500-2</b>	<b>BTL5-P-4500-1</b>
Plastic	Plastic	Plastic
approx. 12 g	approx. 40 g	approx. 90 g
any	any	any
		24 V DC
		100 mA
-40...+85 °C	-40...+85 °C	-40...+60 °C
Magnet	Magnet	Magnet
2 fastening screws DIN 84 M4x35-A2 with washers and nuts		
		Straight connector BKS-B 19-1-__
		Right-angle connector BKS-B 20-1-__



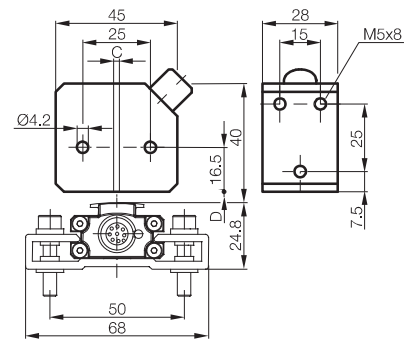
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Magnets captive, control arm



Lateral offset:  
C = ±2 mm  
Vertical distance of magnet:  
D = 0.1...4 mm



Lateral offset:  
C = ±15 mm  
Vertical distance of magnet:  
D = 5...15 mm



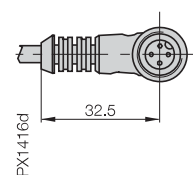
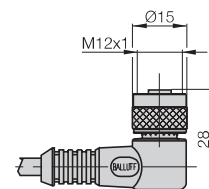
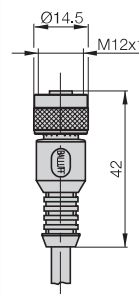
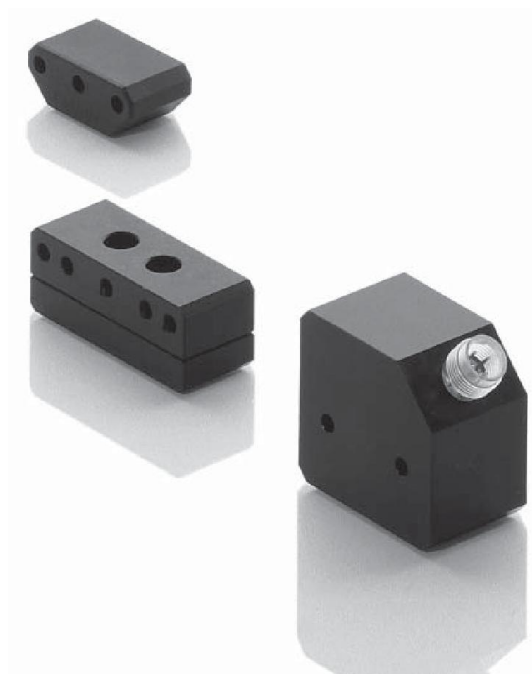
Lateral offset:  
C = ±2 mm  
Vertical distance of magnet:  
D = 0.1...2 mm

■ Please indicate the cable length in the ordering code!  
03, 05, 10, 15  
= PVC, 3 m, 5 m, 10 m or 15 m  
PU-03, PU-05, PU-10, PU-15  
= PUR, 3 m, 5 m, 10 m or 15 m

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**Magnets floating**  
Magnets captive, control arm

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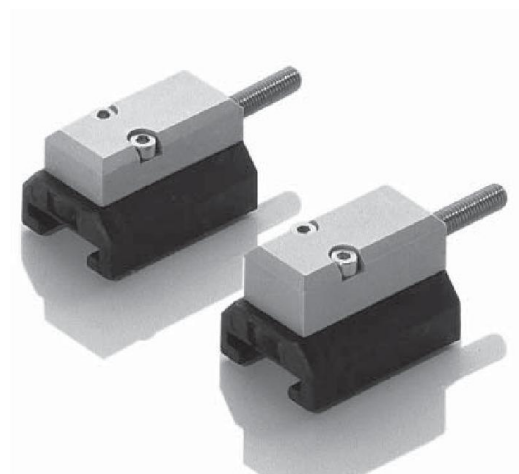
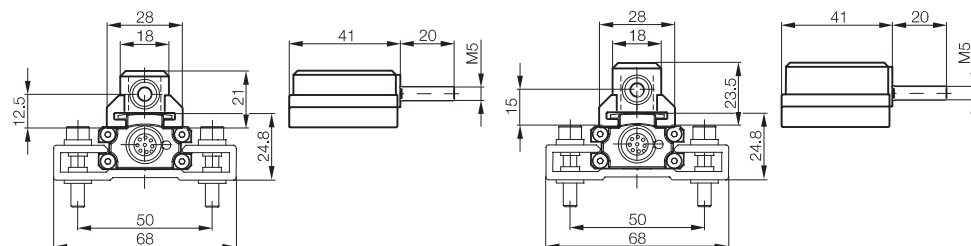
**BIW**  
General data  
Analog interface



# Profile Series PF

## Magnets captive

Description		<b>Magnet</b>	<b>Magnet</b>	
for series		BTL6 profile PF	BTL6 profile PF	
Version		captive	captive	
Part number		<b>BTL5-M-2814-1S</b>	<b>BTL5-N-2814-1S</b>	
Material	Housing	Anodized aluminum	Anodized aluminum	
	Sliding surface	Plastic	Plastic	
Weight		approx. 32 g	approx. 35 g	
Magnet traverse velocity		any	any	
Operating temperature/Storage temperature range		-40...+85 °C	-40...+85 °C	



Length		Number of mounting clamp pairs
to	250 mm	1
251 to	750 mm	2
751 to	1250 mm	3
1251 to	1750 mm	4
1751 to	2250 mm	5
2251 to	2750 mm	6
2751 to	3250 mm	7
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3751 to	4250 mm	9
more than	4251 mm	10

Mounting clamps with isolation washers and screws included with transducer.

BTL6-A-MF07-A-PF/M5 1 pair of replacement mounting clamps and screws, item no.: 180961

