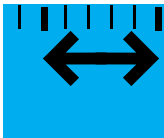


MICROPULSE® SF fill level sensor
For high-precision sanitary filling applications



MICROPULSE®



MICROPULSE[®] transducers

Micropulse SF fill level sensor

Precision level measurement in a sanitary housing

The Micropulse SF fill level sensor provides continuous, absolute fill-level measurement in applications that require adherence to the strictest standards of hygiene and cleanliness. Made from corrosion-free stainless steel with rounded edges and minimal crevices, the Micropulse SF meets the highest international hygiene standards and fulfills strict food industry requirements.

Benefits

- Chemically neutral for all liquids
- Compensates for surface foam to deliver reliable, accurate fill level values
- Adjustment-free installation
- Easy to clean in installed state (CIP - Clean in Place)
- Withstands process temperatures up to 130°C (SIP - Sterilization in Place)
- Standard analog interface ensures wide controller compatibility and flexible installation
- International certification ensures global acceptance
- Highly precise measuring technology is ideal for filling or dispensing applications



Internationally certified



In the USA, 3-A Sanitary Standards Inc. formulates and monitors hygiene guidelines for devices used in the manufacture and packaging of milk and food products. Our products with this designation are 3-A-approved.



The EHEDG (European Hygienic Engineering & Design) designation is the European standard for hygiene in the food industry. Our products with this logo conform to EHEDG standards.



The FDA (Food and Drug Administration) oversees the US food and medicaments industry and certifies devices, materials, as well as systems and machines, from these areas. With such a product designation, you are also able to receive FDA approval for your system.



The ECOLAB designation stands for consistency against aggressive cleaning agents. Devices with ECOLAB markings fulfill these standards.

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Micropulse magnetostrictive measurement

The industry-standard Micropulse SF fill level sensor uses field-tested magnetostrictive technology to provide absolute, continuous, and highly-precise fill level measurement. Non-contact measurement technology ensures unparalleled reliability and performance.

Analog signal

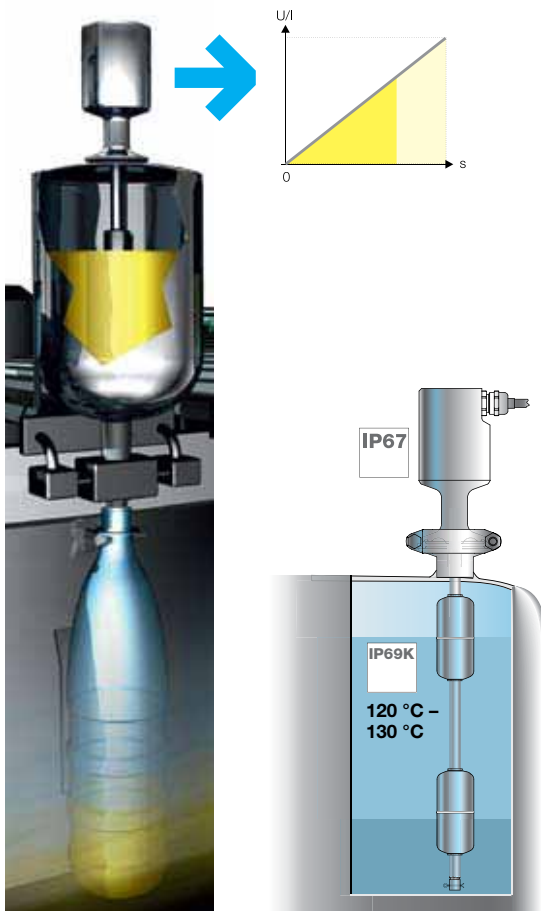
The Micropulse SF provides continuously-variable analog output signals allowing for easy connection to control systems.

Benefits

- Maximum controller compatibility
- High resolution and repeatability for accurate process control
- Rising and falling signal available
- Inherent cable-break monitoring (4...20 mA signal)

Available outputs

- Analog current (4...20 mA or 0...20 mA, rising or falling)
- Analog voltage (0...10 V and 10...0 V, rising and falling)



Series	
Output signal	
Transducer interface	
Customer-side interface	
Part number	
Output voltage	
Output current	
Load current	
Ripple max.	
Load resistance	
System resolution	
Hysteresis	
Repeatability	
Sampling rate	
Max. non-linearity	
Temperature coefficient	
Operating voltage	
Current draw	
Polarity reversal protected	
Overvoltage protection	
Dielectric strength	
Operating temperature	
Process temperature 130° C for one hour*	
Wiring configuration	Color
Output signals	YE
	GY
	PK
	GN
Operating voltage	BU
	BN
	WH

Shield connected to housing

Scope of delivery:

- Transducer
- Condensed user's guide
(full user's guide available for download at www.balluff.com/BTL-SF)

Please order separately:

- Tri Clamp Page 6
- Float Page 6
- O-ring Page 6
- Clamp Ferrule Page 6

PTFE cable – LIF5Y-FC-5Y (7x0.25mm²):

- Temperature resistant up to 200 °C
- Good resistance against chemicals and oil

* Process temperature:

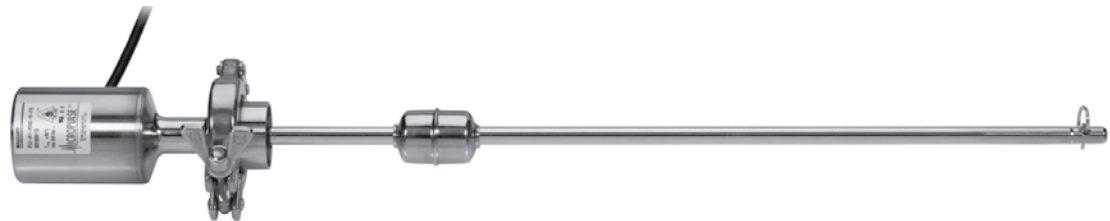
maximum permissible temperature of the rod under the flange (with media contact).

Certain production processes require, for example sterilization at 120 °C – 130 °C for 0.5 – 1 hour.

Extremely precise

MICROPULSE® transducers
Analog interfaces

BTL5 SF rod	BTL5 SF rod	BTL5 SF rod	BTL5 SF rod
Analog	Analog	Analog	Analog
A	E	C	C
Analog	Analog	Analog	Analog
BTL5-A11-M_ _ _ _ -SF- _ _ _ _	BTL5-E1_-M_ _ _ _ -SF- _ _ _ _	BTL5-C1_-M_ _ _ _ -SF- _ _ _ _	
0...10 V and 10...0 V	4...20 mA or 20...4 mA	0...20 mA or 20...0 mA	
max. 5 mA			
≤ 5 mV			
≤ 0.1 mV	≤ 500 ohm (500 ohm)	≤ 500 ohm (500 ohm)	
≤ 4 μm	≤ 0.2 μA	≤ 0.2 μA	
System resolution/min. 2 μm	≤ 4 μm	≤ 4 μm	
f _{STANDARD} = 500 Hz	System resolution/min. 2 μm	System resolution/min. 2 μm	
±100 μm to 500 mm nominal stroke	f _{STANDARD} = 500 Hz	f _{STANDARD} = 500 Hz	
±0.02 % 500... max. nominal stroke	±100 μm to 500 mm nominal stroke	±100 μm to 500 mm nominal stroke	
≤ 40 ppm/K for nominal stroke 500 mm, float at center of measuring range	±0.02 % 500... max. nominal stroke	±0.02 % 500... max. nominal stroke	
20...28 V DC	≤ 40 ppm/K for nominal stroke 500 mm, float at center of measuring range	≤ 40 ppm/K for nominal stroke 500 mm, float at center of measuring range	
≤ 150 mA	20...28 V DC	20...28 V DC	
Yes	≤ 150 mA	≤ 150 mA	
36 V	Yes	Yes	
500 V DC (GND to housing)	36 V	36 V	
-40...+85 °C	500 V DC (GND to housing)	500 V DC (GND to housing)	
-40...+100 °C	-40...+85 °C	-40...+85 °C	
BTL5-A11...	-40...+100 °C	-40...+100 °C	
0 V Output	BTL5-E10... BTL5-E17...	BTL5-C10... BTL5-C17...	
10...0 V	4...20 mA 20...4 mA	0...20 mA 20...0 mA	
0...10 V	0 V Output 0 V Output	0 V Output 0 V Output	
GND	GND GND	GND GND	
+24 V DC	+24 V DC +24 V DC	+24 V DC +24 V DC	



Ordering example:

BTL5- 1 -M_ _ _ _ -SF- _ _ _ _

Interface	Output Signal	Standard Nominal stroke [mm]	Radial connection
A	1 rising and falling for A	0025, 0050, 0075, 0100, 0125, 0150, 0175, 0200, 0225, 0250,	F02 PTFE cable 2 m
E	0 rising (for C and E)	0275, 0300, 0325, 0350, 0375, 0400, 0425, 0450, 0475, 0500,	F05 PTFE cable 5 m
C	7 falling (for C and E)	0550, 0600, 0650, 0700, 0750, 0800, 0850, 0900, 0950, 1000,	F10 PTFE cable 10 m
		1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000,	F15 PTFE cable 15 m
		2250, 2500 or in 5 mm increments on request	F20 PTFE cable 20 m

MICROPULSE® transducers

Micropulse SF fill level sensor

100 %
stainless steel



IP69K



FDA- and
EHEDG-
conformal

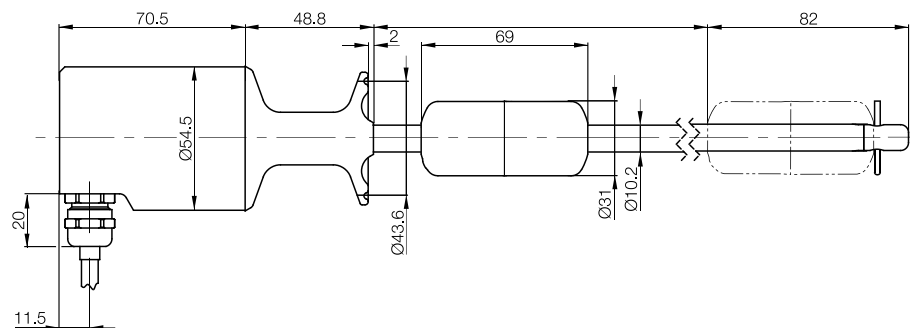
Series	BTL5 SF rod
Transducer interface	Analog
Customer-side interface	Analog
Part number	BTL5-...-M...-SF-F...
Polarity reversal protected	Yes
Overvoltage protection	36 V
Dielectric strength	500 V (GND to housing)
Degree of protection as per IEC 60529	IP 67/IP 69K (flange and tube)
Housing material	Stainless 1.4404
Flange and tube material	1.4404
Connection	Sensor with lead
Attachment	1.5" Tri Clamp i.a.w. SSI 3A standard 74-03
Pressure rating	300 bar (depends on float)
EMC tests:	
RF Emission	EN 55016-2-3 Group 1, Class A and B
Static Electricity (ESD)	IEC 61000-4-2/EN 61000-4-2 Severity 3
Electromagnetic Fields (RFI)	IEC 61000-4-3/EN 61000-4-3 Severity 3
Rapid Transients (BURST)	IEC 61000-4-4/EN 61000-4-4 Severity 3
Conducted interference induced by high frequency fields	IEC 61000-4-6/EN 61000-4-6 Severity 3
Withstand voltage (Surge)	IEC 61000-4-5/EN 61000-4-5 Severity 2
Magnetic fields	IEC 61000-4-8/EN 61000-4-8 Severity 4
Standard nominal stroke (mm)	0025, 0050, 0075, 0100, 0125, 0150, 0175, 0200, 0225, 0250, 0275, 0300, 0325, 0350, 0375, 0400, 0425, 0450, 0475, 0500, 0550, 0600, 0650, 0700, 0750, 0800, 0850, 0900, 0950, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2250, 2500 or in 5 mm increments on request

Scope of delivery:

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Please order separately:

- Tri ClampPage 6
- FloatPage 6
- O-ring.....Page 6
- Clamp Ferrule.....Page 6



Attention!

Prior to design, installation and startup, please read the instructions in the full user's guide! (download available at www.balluff.com/BTL-SF)



MICROPULSE® transducers

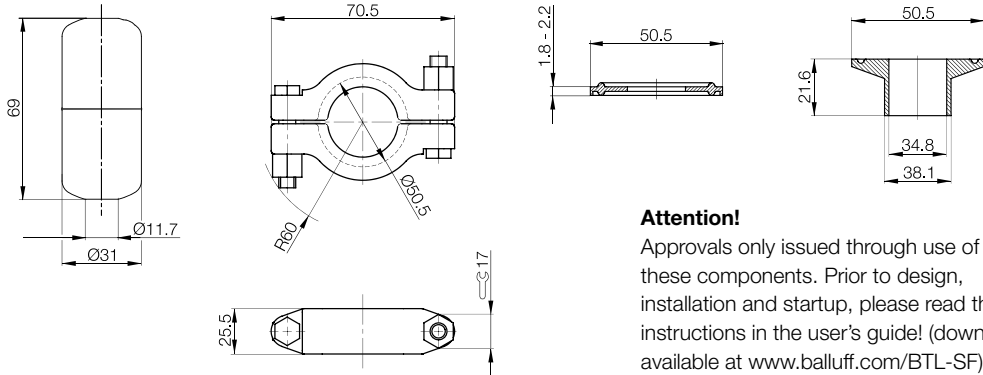
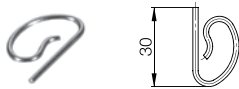
Accessories



Description for series	Float BTL5 SF rod	Tri Clamp (DIN 32676) BTL5 SF rod	O-ring BTL5 SF rod	Clamp Ferrule BTL5 SF rod
Part number	BTL-S-3112-4Z	BAM MC-XA-006-D38,1-5	BAM SE-XA-002-D38,1-5	BAM-AD-XA-003-D38,1-5
Material	Stainless 1.4404	USA ASTM 316 (1.4401)	Platinum catalyzed silicone	Stainless 1.4435
Weight	approx. 30 g			
Operating temperature/ Storage temperature	-40...+130 °C			
Insertion depth in water	approx. 31 mm			
Pressure rating (static)	24 bar			

Included in scope of delivery for float:

- Float
- Instructions
- Cotter key (spring pin 2x30)



Attention!

Approvals only issued through use of these components. Prior to design, installation and startup, please read the instructions in the user's guide! (download available at www.balluff.com/BTL-SF)

Online Product Information Resources



For additional information on the Micropulse BTL5 SF transducer, including technical documentation and downloadable product literature, visit www.balluff.com/BTL-SF



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www.balluff.com/BTL-SF

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