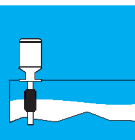




MICROPULSE[®]

SF

General data	142
Analog interface	144
Floats and accessories	146



The magnetostrictive working principle is ideal for the continuous high-precision measurement of fluid filling levels. Waveguides and processing electronics are enclosed inside a housing made from stainless steel. Stainless steel floats with permanent integrated magnets mark the current filling level in the tank or vessel. The design of the sensors meets international hygiene standards.

BTL-SF Filling Level Sensor

General data

more added value

- Continuously precise measurement in μ area delivers excellent filling results
- 100 % stainless steel ensures top hygiene standards and long service life
- International certificate guarantees maximum quality

Maximum precision for food hygiene – internationally certified

The BTL-SF filling level sensor ensures continuously precise measurement in applications that demand extreme hygiene. Made from corrosion-free stainless steel with excellent surface quality and rounded edges, the sensor meets the highest international hygiene standards and fulfills all strict requirements of the food industry. Take advantage of the best quality directly from the manufacturer.

Other benefits:

- Neutral for all liquids
- Compensates for foam, thus delivering reliable filling level values
- Adjustment-free installation
- Easy to clean in installed state (CIP – Clean in Place)
- For process temperatures up to 130 °C (SIP – Sterilization in Place)
- Standardized interfaces ensure flexible installation
- Internationally certified quality guarantees global marketing and sales of your system
- Rising and falling signal available



In the USA, 3-A Sanitary Standards Inc. formulates and monitors hygiene guidelines for devices used in the manufacture and packaging of milk and foodstuffs. 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 pharmaceutical industry and certifies devices, materials, systems and machines from these sectors. A product designation of this kind makes your system eligible for FDA approval.



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



**100 %
stainless steel**

BTL-SF Filling Level Sensor

General data

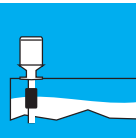


IP69K

A
3
74-03

FDA and
EHEDG
conformity

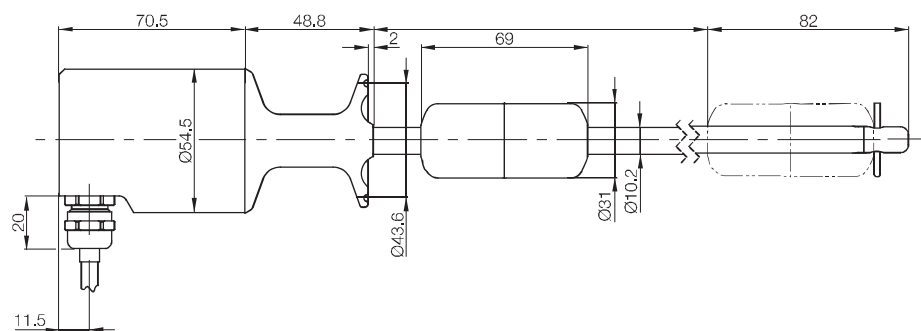
Series	BTL5 rod SF
Transducer interface	analog
Input interface	analog
Part number	BTL5-...-M____-SF-F_____
Polarity reversal protected	yes
Overvoltage protection	36 V
Dielectric strength	500 V DC (GND to housing)
Degree of protection as per IEC 60529	IP 67/IP 69K (flange and tube)
Housing material	Stainless steel 1.4404
Flange and tube material	1.4404
Connection	Cable connection
Mounting	1.5" Tri Clamp as per SSI 3A standard 74-03
Pressure rating	300 bar (depending on float)
EMC testing:	
RF emission	EN 55016-2-3 Group 1, Class A and B
Static electricity (ESD)	EN 61000-4-2/EN 61000-4-2 Severity Level 3
Electromagnetic fields (RFI)	EN 61000-4-3/EN 61000-4-3 Severity Level 3
Fast transients (BURST)	EN 61000-4-4/EN 61000-4-4 Severity Level 3
Line-induced disturbances, induced by high-frequency fields	EN 61000-4-6/EN 61000-4-6 Severity Level 3
Surge voltage	IEC 61000-4-5/EN 61000-4-5 Severity Level 2
Magnetic fields	IEC 61000-4-8/EN 61000-4-8 Severity Level 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



SF
General data
Analog interface
Floats and accessories

- Included:
- Transducer
 - Short user's guide

Please order separately:
Tri Clamp, page 146
Floats, page 146
O-ring, page 146
Welded hexagon nipple, page 146



**Caution! Prior to design,
installation and startup,
please read the instructions
in the user guide!**
www.balluff.com

BTL-SF Filling Level Sensor

Analog interfaces

The industry-standard filling level sensor works with the tried-and-tested Micropulse technology, an absolute and contact-free magnetostrictive measurement, which has been associated with top reliability for years. In addition, it has analog interfaces and due to this common standard signal, can be used in process automation.

Analog signal

A signal that can accept continuous, (almost) infinitely variable, values between a minimum and a maximum is described as an analog signal.

The output signal of the BTL-SF filling level sensor is analog and directly proportional to the position of the float on the sensor tube.

Features:

- Reasonably priced system solution
- Can be used from each controller
- Cable break monitoring through 4...20 mA signal
- Current signal, interference-free signal transfer
- High resolution and repeatability
- Rising and falling signal available

Variants:

- Current (4...20 mA or 0...20 mA)
- Voltage (0...10 V or 10...0 V)



Series	
Output signal	
Transducer interface	
Input interface	
Part number	
Output voltage	
Output current	
Load current	
max. ripple	
Load resistance	
System resolution	
Hysteresis	
Repeat accuracy	
Sampling rate	
Non-linearity, max.	
Temperature coefficient	
Operating voltage	
Current consumption	
Polarity reversal protected	
Overvoltage protection	
Dielectric strength	
Operating temperature	
Process temperature 130° C for one hour	
Pin assignments	Color
Output signals	YE
	GY
	PK
	GN
Operating voltage	BU
	BN
	WH

Connect shield to housing

■ Included:

- Transducer
- Short user's guide

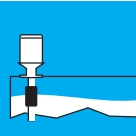
Please order separately:

- Tri Clamp, page 146
- Floats, page 146
- O-ring, page 146
- Welded hexagon nipple, page 146

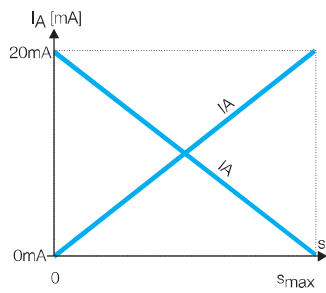
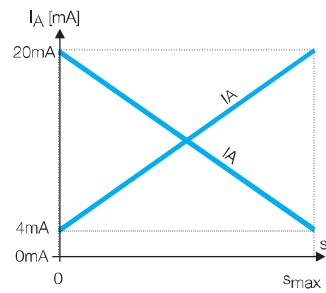
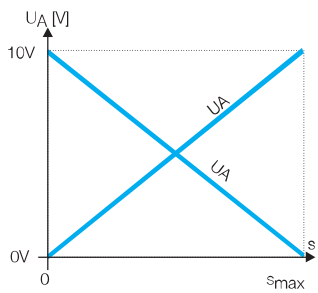
Teflon cable – LIF5Y-FC-5Y (7x0.25mm²):

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

BTL5 rod SF	BTL5 rod SF	BTL5 rod SF
analog	analog	analog
A	E	C
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 ohms (500 ohms)	≤ 500 ohms (500 ohms)
≤ 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 up to 500 mm nominal stroke	f _{STANDARD} = 500 Hz	f _{STANDARD} = 500 Hz
±0.02 % 500... max. nominal stroke	±100 μm up to 500 mm nominal stroke	±100 μm up 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 (ground to housing)	36 V	36 V
-40...+85 °C	500 V DC (ground to housing)	500 V DC (ground to housing)
-40...+100 °C	-40...+85 °C	-40...+85 °C
	-40...+100 °C	-40...+100 °C
BTL5-A11...	BTL5-E10... BTL5-E17...	BTL5-C10... BTL5-C17...
	4...20 mA 20...4 mA	0...20 mA 20...0 mA
0 V Output	0 V Output 0 V Output	0 V Output 0 V Output
10...0 V		
0...10 V		
GND	GND GND	GND GND
+24 V DC	+24 V DC +24 V DC	+24 V DC +24 V DC



SF
General data
Analog interface
Floats and accessories



Ordering example:

BTL5-1-M-_-SF-_-_-

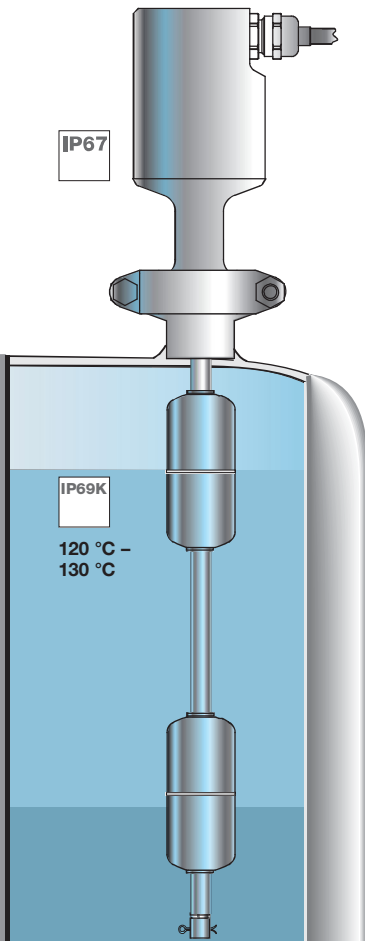
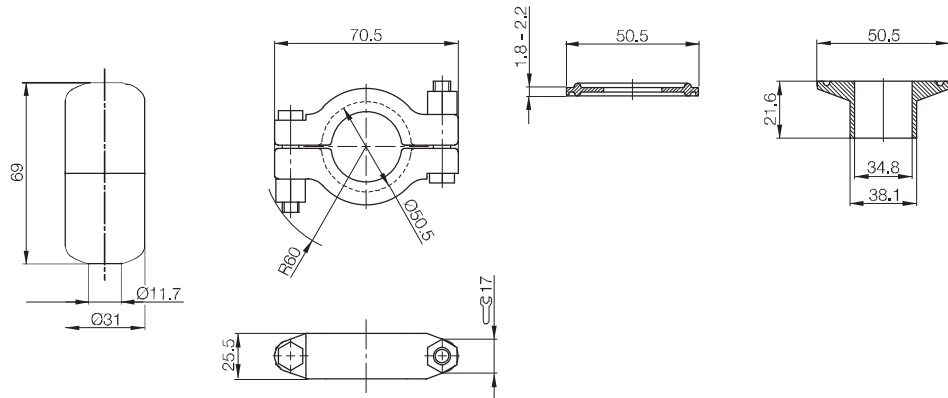
Interface	Output signal	Standard nominal stroke [mm]	Radial connection
A	1 Rising	0025, 0050, 0075, 0100, 0125, 0150,	F02 Teflon cable 2 m
E	and falling	0175, 0200, 0225, 0250, 0275, 0300,	F05 Teflon cable 5 m
C	with A	0325, 0350, 0375, 0400, 0425, 0450,	F10 Teflon cable 10 m
	0 Rising	0475, 0500, 0550,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

BTL-SF Filling Level Sensor

Floats and accessories



Description	Float	Tri Clamp (DIN 32676)	O-ring	Welded hexagon nipple
for series	BTL5 rod SF	BTL5 rod SF	BTL5 rod SF	BTL5 rod SF
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 steel 1.4404	USA ASTM 316 (1.4401)	Platinum catalyzed silicone	Part no. W. 1.4435 BN2 (Fe ≤ 0.5 %) as per EB 10088
Weight	ca. 30 g			
Operating temperature/ Storage temperature range	-40...+130 °C			
Displacement in water	approx. 31 mm			
Pressure rating (static)	24 bar			



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.

"Junction float"
on request.

- Included in scope of delivery for float:
 - Float
 - Instructions
 - Cotter pin (spring pin 2x30)



Caution!

Approvals only issued through use of these components. Prior to design, installation and startup, please read the instructions in the user guide!