

BxS Series

The product family for Industry 4.0



Use  **IO-Link**
Universal · Smart · Easy

Our solutions for:

- ▶ Pressure
- ▶ Differential Pressure
- ▶ Temperature
- ▶ Level
- ▶ Temperature/Level

Control
every move

Barksdale[®]
CONTROL PRODUCTS

CRANE Barksdale, Inc./Barksdale GmbH
A Subsidiary of Crane Co.

BxS Series

Perfectly equipped for the future

Wide range of applications

The extended BxS Series has been designed for **maximum flexibility** in a wide range of industrial applications and environments.

Industry 4.0 ready

All devices of the BxS Series are **IO-Link** capable. Continuous communication from the control station to the sensor, data exchange during operation, **plug & play** capability, automatic device identification and **remote** parameter setting are just a few benefits of the communication standard.



BPS3000
Pressure Switch



BTS3000
Temperature Switch



BTLS2000
Temperature / Level Switch



BLS3000/BLS2000
Level Switch



BDS3000
Differential Pressure Switch

Compact and modern design

The series is characterised by an **installation height of 110 mm** and a **diameter of 41 mm**, which allows a compact installation of many switches. The angled top side is aesthetically pleasing and a functional highlight - allowing visibility in a range of installations.



2-way rotating design

The switch can be freely rotated up to 320° on two horizontal axes and can be perfectly aligned with the external environment. Assembly and installation is simple; turn it to the desired position, and that's it.

Perfect readability

The **4-digit 14-segment LED display** guarantees **perfect readability** regardless of positioning: even when **mounted upside down**, the display can be read correctly because the software allows the display to be inverted.

High protection with IP65/IP67 and EMI protection

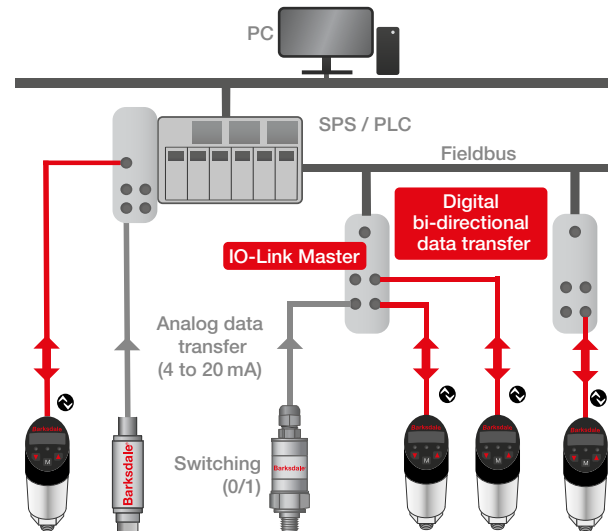
Harsh environmental conditions with dust or water are no problem for the BxS Series. Continuous functionality is achieved through a sophisticated housing seal and a keypad integrated into the plastic housing. The high EMI protection allows installation in environments where high performance walkie-talkies are used, e.g. in the steel and energy industry.



Efficiency increase through digital, bi-directional communication

The future is digital

The term **Industry 4.0**, which is almost ubiquitous in the media, becomes reality through the use of **IO-Link – the world's first standardized technology at sensor level**. The IO-Link interface closes a gap and enables consistent communication from the sensor/actuator level to all common fieldbus systems. The result is a **fieldbus-independent interface**.



Digital transmission of the measured values from the sensor to the controller guarantees that the transmitted value corresponds exactly to the measured value.



Reduction of machine downtimes through status information and diagnostic options in the system.



Automatic acceptance of the parameterization enables a device replacement even by less qualified personnel.



Remote parameter setting with simultaneous positioning of the IO-Link devices directly on the machine. Direct transmission of the parameters in the event of service allows **immediate identification and localization of the sensors**.



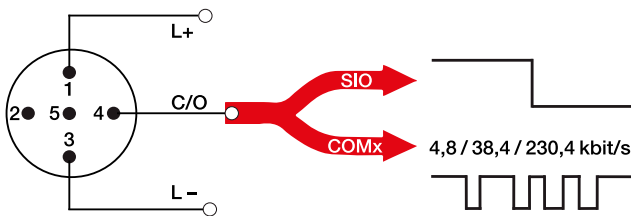
Robustness of the data transmission against external influences by means of a 24 V signal. Shielded cables and associated grounding are not necessary. The 3/5-core unshielded cable is the reliable standard connection between the IO-Link master and device.





Backward compatible

In addition to serial communication in IO-Link mode, IO-Link sensors can also be used in downward compatible simple switching mode. This means that components with and without IO-Link can be operated simultaneously in a system.



Serial, bi-directional, point-to-point connection for signal transmission and 24 V power supply

IO-Link-capable sensors automatically detect the absence of a master and independently switch to SIO mode – the device behaves like a classic switch. Switches can also be connected to an IO-Link master, which then transmits the switching states to the downstream fieldbus systems. Thus, no additional master is required for the classic sensors.

Fail-safe data transfer

The digital transmission from the sensor to the PLC prevents the loss of accuracy due to multiple AD/DA conversions as well as unnoticed signal falsification due to EMC influence.

Analog data transfer



Digital data transfer



Effective project planning and parameterization via IODD file

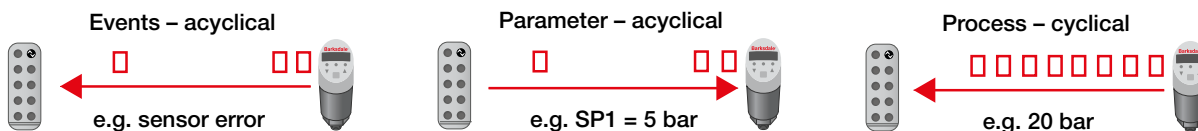
The use of the Input / Output Device Description (IODD) enables USB-interface-like and easy setup of devices in the IO-Link system. The availability of the IODD files for

each device is guaranteed globally: Quick and easy to find on www.io-link/IODDfinder

Data types

Different data types can be initiated by the master or by the device at a digital interface.

These include cyclical process data, anticyclical parameters and events.



BxS Applications



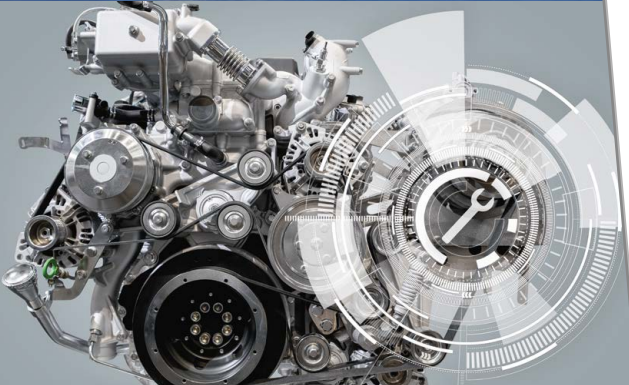
Public Health

Technology helps to protect lives, e.g. by installing the BPS3000 in ventilators used in hospitals. Here, the BPS3000 continuously measures the air supply within the system and sends the measurement data as an analog signal (4 – 20 mA or 0 – 1 0V) to the connected control unit.



Marine

The BPS3000 can be used in mooring systems for large ships. Whether on the open sea or in port, its IO-Link advantages make the BPS3000 an optimal solution for safely loading and unloading the ship at any time. The BPS3000 has a BV (Bureau Veritas) approval and thus meets not only the technical, but also the approval requirements of the maritime industry.



Internal combustion engines

For testing and loading internal combustion engines, the BPS3000 can be used to monitor and control the hydraulic pressure at the hydraulic coupling device in order to simulate a wide range of loads on the engine over a 24-hour period. The analog output (4 – 20 mA or 0 – 1 0V) of the BPS is used to monitor the clutch pressure, and the switching point is used to ensure reliability at high pressure.



Holding and clamping systems

Holding and clamping systems are applications where the BPS3000 is used directly on the hydraulic pumps to monitor the pressure. Features such as peak value monitoring, but also an innovative switching point adjustment over a defined pressure range (window technology) make the BPS the ideal partner in this application. This can also be used on HPU workover units, which are temporarily used for repairs.



Iron and steel industry

In iron and steel production, heavy machines with hydraulic systems are used to implement complex control requirements. The BPS3000 is used in these hydraulic systems as a pressure control element for hydraulic oil up to 400 bar.

Mining industry

The BDS3000 with IO-Link can be installed in diesel filling stations for heavy commercial vehicles for differential pressure monitoring and to optimize filter replacement. IO-Link is used for digital transmission of the measured values from the sensor to the controller, ensuring high accuracy and traceability. By continuously monitoring filter contamination, the BDS3000 makes a valuable contribution to predictive maintenance.

Wind turbines

The functionality and efficiency of a wind turbine depends on the interaction of the components used. For this reason, the gearbox, blade pitch control and brake must be protected against functional failure. This requires high-quality pressure, temperature and level switches and sensors for grease lubrication and oil level monitoring. With the BxS Series, the right product family is available to monitor all relevant parameters of fluid technology.

Hydraulic brake systems

Hydraulic brake systems, ranging from food trucks to semitrailers, the so-called “pushers”, are a potential application for the BxS Series. The BPS3000 is used here to calculate the weight on the tongue when the trailer is coupled. The use of IO-Link reduces the need for maintenance and generates the required data easily.

Beverage industry

The BTS3000 can be used for can or bottle cleaning to ensure the correct temperature of the water during the cleaning process.



BPS3000

- ▶ Measuring ranges: 0 ... 100 mbar to 0 ... 600 bar, vacuum
- ▶ Ceramic or piezoresistive sensor
- ▶ Analog output 4 – 20 mA or 0 – 10 V
- ▶ IO-Link compatible



Pressure

Electr. Dual Pressure Switch

BPS3000

Features

- ▶ Measuring ranges: 0 ... -1 bar to 0 ... 600 bar gauge
- ▶ Max. 2 switch points
- ▶ Analog output 4 - 20 mA or 0 - 10 V
- ▶ Rotatable 320° display & electrical connection
- ▶ Menu navigation refers to VDMA standard
- ▶ IO-Link communication interface

Applications

- ▶ Pressure control for:
 - Hydraulics & Pneumatics
 - Lubrication system
 - Cooling



Technical Data

Sensor element:	Ceramic sensor optional: piezoresistive sensor
Materials:	
Wetted parts:	Stainless steel, mat. no. 1.4301, brass MS58*
Electronics housing:	Stainless steel, mat. no. V2A, PA / PC
Seals:	FKM, EPDM
Operating elements:	3 easy-response pushbuttons
System of protection:	IP65, IP67
Protection class:	III
Electrical connection:	Plug M12 x 1, 4-pin / 5-pin / 8-pin (depending on output code)
Process connection:	see order code
Dimensions:	110 x 41 mm (without plug connector)
Weight:	approx. 200 g
A/D converter:	
Resolution:	12 bit (4096 steps per measuring span)
Scanning rate:	1000 / s
Linearity error:	< ± 0.5 % v. f. s. at +25 °C
Temperature influence:	TC zero < ±0.2 % FSO / 10K TC span < ±0.3 % FSO / 10K
Compensation range:	-10 °C... +70 °C
Repeatability:	±0.1 % FSO
Temperature range:	
Medium:	-25 °C... +100 °C
Electronics:	-10 °C... +70 °C ¹⁾
Storage:	-30 °C... +80 °C
Power supply:	15... 32 V DC, output code 6: 20... 32 V DC reversed polarity protected (SELV, PELV)
Digital display:	4-digit 14-segment LED display, red, digit height 9 mm
Error display:	LED red and alphanumeric display
Power consumption:	approx. 50 mA (without load) output code 6: approx. 80 mA
Relay output:	Rel. 1 normally closed, Rel. 2 normally open Load: max. 1A, max 60 V, max. 30 W
Analog output:	
Current output:	4...20 mA
Load:	max. RI = (Ub-12V) / 20 mA RI = 600 Ohm at Ub = 24 V DC
Scanning rate:	2 ms
Voltage output:	0...10 V DC
Rating:	max. 10 mA
Adjustment range:	25 %... 100 % f. s.

Transistor switching outputs / IO-Link:	
Switching function:	Normally open/normally closed, standard / window mode and diagnosis function adjustable
Adjustment range for switching point and hysteresis:	0 %... 125 % f. s.
Switching frequency:	max. 100 Hz
Load:	max. 500 mA, short-circuit proof, IO-Link: max. 250 mA
Delay:	0.0 s ... 50 s adjustable
Status display(s):	LED(s) red
Interfaces	
Communication interface:	IO-Link
Transmission type:	COM2 (38,4 kBaud)
IO-Link revision:	1.1
SDCI standard:	IEC 61131-9
Profiles:	Smart Sensor
SIO mode:	yes
Device type:	Class A
Process data variable:	1
Binary data channel:	2
Min. process cycle time [ms]	2.5
Device ID:	0x011...
EMV /ESD	EN 61000-4-2 ESD 4 kV CD / 8 kV AD
	EN 61000-4-3 HF radiated 10 V/m
	EN 61000-4-4 Burst 2 kV
	EN 61000-4-5-Surge 1/2 kV
	EN 61000-4-6 HF conducted 10 V
Shock resistance	DIN EN 60028-2-27 50 g (11 ms)
Vibrations resistance	DIN EN 60028-2-26 20 g (10...2000 Hz)
Approvals:	BV-50018/A02), cULus 1) - E42816

* In the pressure inlet a damping screw made of brass is mounted. This screw can be removed if required, e.g. in case of soiled medium or material incompatibility, using a slotted screw driver (max. width 3 mm). The pressure switch is less resistant to pressure peaks when the damping screw has been removed.

¹⁾ Conditions of use with cULus: 60 °C max. ambient, power supply max. 28 V DC

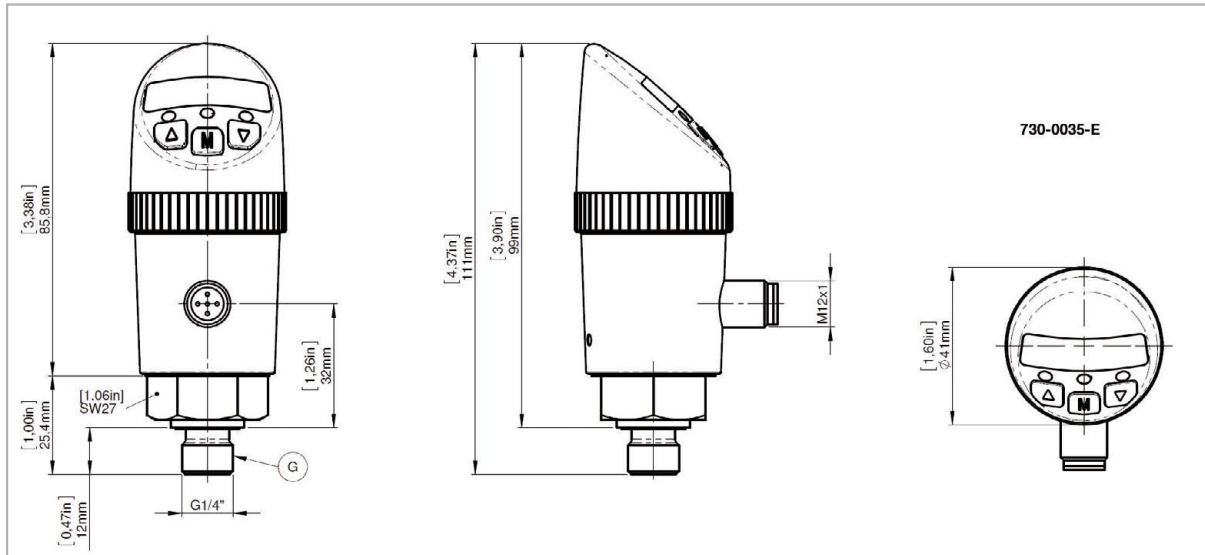
²⁾ BV approval only with output code 1-5

Electr. Dual Pressure Switch

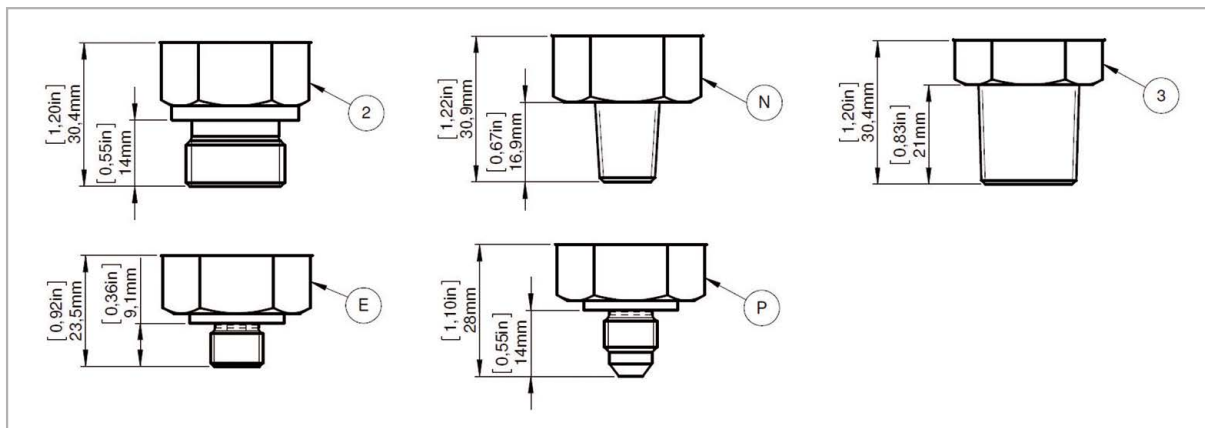
Accessories

Order Number	Description
907-0357	Plug connector M12 x 1, 4-pin, with screw terminals, angled (IP65)
907-0185	Plug connector M12 x 1, 5-pin, with screw terminals, angled (IP65)
908-0361	Plug connector M12 x 1, 5-pin, with moulded cable, (IP67), 2 m length
908-0544	Plug connector M12 x 1, 8-pin, with moulded cable (IP67), 2 m length

Dimensions (mm / inch)



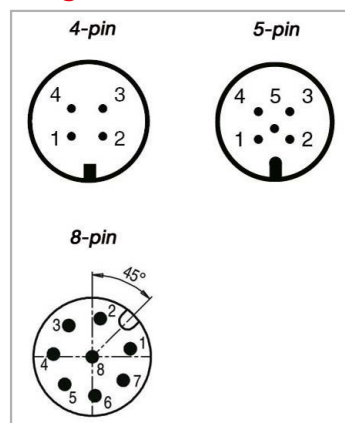
Process connection



Legend

G	G1/4" Ceramic
N	1/4" NPT Ceramic
2	G1/2" flush diaphragm
3	1/2" NPT flush diaphragm
E	7/16-20 UNF (SAE)
P	7/16-20 UNF (JIC)

Plug



Electrical Connection

Pin	Signal Output Code 1, 7	Signal Output Code 2, 3	Signal Output Code 4, 5, 8	Signal Output Code 6
1	+Ub	+Ub	+Ub	+Ub
2	SP2	Signal	Signal	SP1a
3	0V	0V	0V	SP1b
4	SP1 / IO-Link*	SP1	SP1 / IO-Link*	0V
5	-	-	SP2	SP2a
6	-	-	-	SP2b
7	-	-	-	-
8	-	-	-	Housing

* only code 7 and 8

Order Code

BPS3000	
BPS3	Base Model
Output	
1	2 switch points
2	4...20 mA - 1 switch point
3	0...10 V - 1 switch point
4	4...20 mA - 2 switch points
5	0...10 V - 2 switch points
6	2 relays switch points (1 x NO SPST / 1 x NC SPST)(requires piezo. sensor / code P)*, no UL
7	IO-Link / 2 switch points (PNP, NPN, PP)
8	IO-Link / 2 switch points (PNP, NPN, PP) / Analog Output
Process Connection	
G	G1/4" ext. thread
2	G1/2" flush diaphr. (requires piezoresistive sensor / code P* /10-600 bar only)
N	1/4"NPT ext. thread
3	1/2"NPT flush diaphr. (requires piezoresistive sensor / code P* / 10-600 bar only)
1	40x40 Cetop/Manifold - on request
E	7/16-20 UNF (SAE4) ext. thread
P	7/16-20 UNF (37° JIC) ext. thread
Sealing	
V	FKM
E	EPDM
Electrical Connection	
M	M12
Range	
- 1 . 0 B V	-1 ... 0 bar requires piezoresistive sensor / code P)*, IP65 only
0 0 0 1 B V	-1 ... 1 bar requires piezoresistive sensor / code P)*, IP65 only
0 0 0 5 B V	-1 ... 5 bar requires piezoresistive sensor / code P)*, IP65 only
0 0 1 0 B V	-1 ... 10 bar requires piezoresistive sensor / code P)*, IP65 only
0 0 0 1 B A	0 ... 1 bar absolute (requires piezoresistive sensor / code P)*
0 0 0 5 B A	0 ... 5 bar absolute (requires piezoresistive sensor / code P)*
0 0 1 0 B A	0 ... 10 bar absolute (requires piezoresistive sensor / code P)*
0 0 . 2 B	0 ... 0.2 bar (requires piezoresistive sensor / code P)*,IP65 only
0 0 . 5 B	0 ... 0.5 bar (requires piezoresistive sensor / code P)*,IP65 only
0 0 0 1 B	0 ... 1 bar (requires piezoresistive sensor / code P)*,IP65 only
0 0 0 2 B	0 ... 2 bar (requires piezoresistive sensor / code P)*, IP65 only
0 0 0 5 B	0 ... 5 bar (requires piezoresistive sensor / code P)*, IP65 only
0 0 1 0 B	0 ... 10 bar
0 0 5 0 B	0 ... 50 bar
0 1 0 0 B	0 ... 100 bar
0 2 0 0 B	0 ... 200 bar
0 4 0 0 B	0 ... 400 bar
0 6 0 0 B	0 ... 600 bar (requires piezoresistive sensor / code P)*
	Others on request
Sensor	
Blank	Standard ceramic sensor
P	*Piezoresistive sensor

Example:

BPS3 4 G V M 0 2 0 0 B

Special designs on request

BDS3000

- ▶ Measuring ranges: differential pressure 0 ... 350 mbar to 0 ... 35 bar
- ▶ Analog output 4 – 20 mA or 0 – 10 V
- ▶ IO-Link compatible



Differential Pressure

Electronic Dual Differential Pressure Switch

BDS3000

Features

- ▶ Measuring ranges: differential press. 0...350 mbar to 0...35 bar
- ▶ Enclosures Rating Type 4X (IP65) / Type 6 (IP67)
- ▶ Two switch points
- ▶ Analog output 4 - 20 mA or 0 - 10 V
- ▶ Superior EMI protection
- ▶ Rotatable 320° display & electrical connection
- ▶ IO-Link communication interface

Applications

- ▶ Filtration
- ▶ Machine tool industry
- ▶ Factory Automation
- ▶ Lubrication monitoring
- ▶ Pumps and compressors

Technical Data

Sensor element:	piezoresistive sensor
Materials:	
Wetted parts:	Stainless steel, mat. No. 1.4301.
Electronics housing:	Stainless steel, mat. No. VA2, PA / PC
Seals:	FKM, EPDM
Operation elements:	3 easy-response pushbuttons
System of protection:	Type 4X (IP65) / Type 6 (IP67)
Protection class:	III
Electrical connection:	Plug M12 x 1, 4/5 pin
Process connection:	see order code
Dimensions:	76 x 41 x 122 mm
Weight:	Approx. 600 g
A/D-Converter:	
Resolution:	12 bit (4096 steps per measuring span)
Scanning rate:	1000 / s
Linearity error:	< ± 0.5 % v. f. s. at +25 °C
Temperature influence:	TC zero < ±0.2 % FSO / 10K TC span < ±0.3 % FSO / 10K
Compensation range:	0°C to +50°C (32°F to 122°F)
Repeatability:	±0.1 % FSO
Temperature range:	
Media:	-25°C to +100°C (-13°F to 212°F)
Electronics:	-10°C to + 70°C (14°F to 158°F)
Storage:	-30°C to +80°C (-22°F to 176°F)
Power supply:	15 ... 32 V DC, reversed polarity protected (SELV, PELV) Class 2
Digital display:	4-digit 14-segment LED red display, digit height 9 mm
Display rate:	20/s
Power consumption:	Approx. 50 mA (without load)
Error display:	LED RED and alphanumeric display
Analog output:	
Current output:	4...20 mA
Load:	max. RI = (Ub-12V) / 20 mA RI = 600 Ohm at Ub = 24 V DC
Scanning rate:	2 ms
Voltage output:	0... 10 V DC
Rating:	max 10 mA
Adjustment range:	25 % ... 100 f. s.



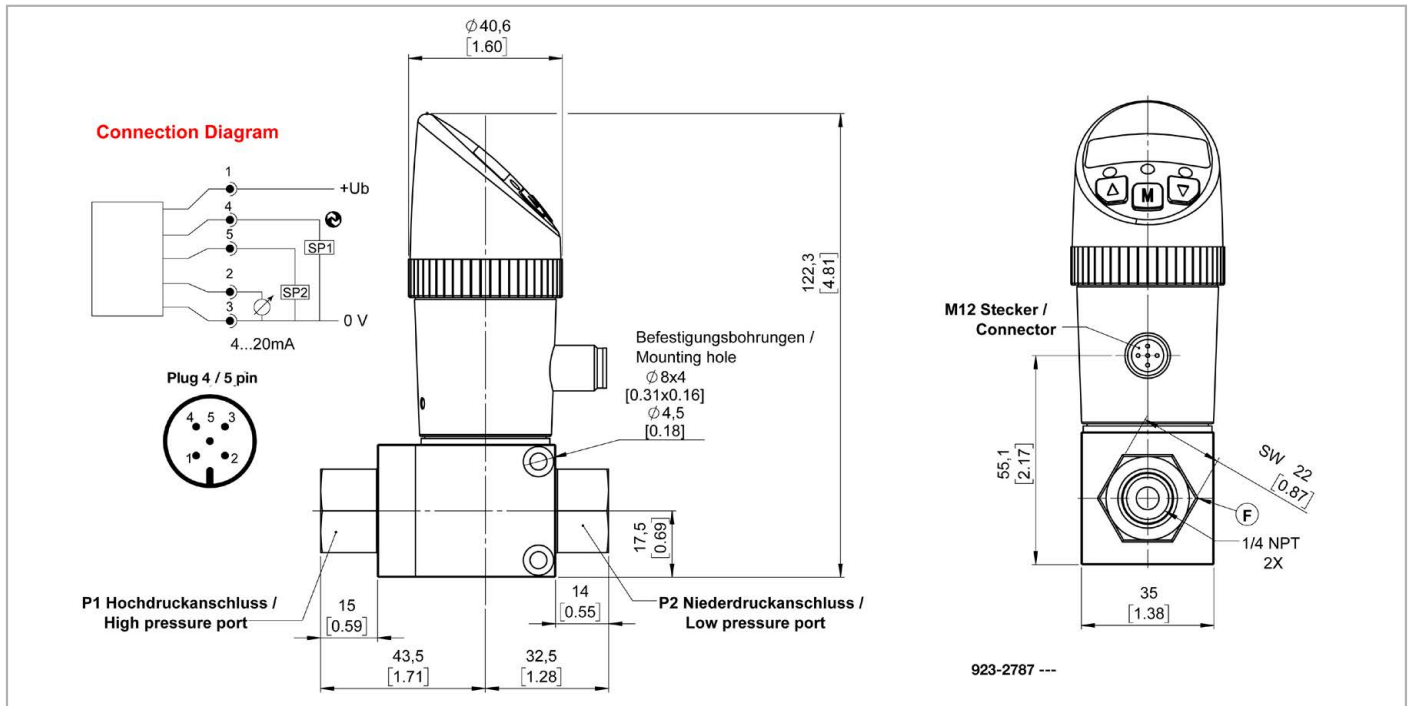
Transistor switching outputs:		
Switching function:	Normally open/normally closed, standard / windows mode and diagnosis function adjustable	
Switching output:	PNP IO-Link: PNP / NPN / PP	
Adjustment range for switching point and hysteresis:	0% to 125% f. s.	
Switching frequency:	Max. 100 Hz	
Load:	Max. 500 mA (250 mA IO-Link units) short-circuit-proof	
Delay:	0.0 s to 50.0 s adjustable	
Status display(s):	LED(s) red	
Interfaces		
Communication interface	IO-Link	
Transmission type	COM2 (38,4 kBaud)	
IO-Link revision:	1.1	
SDCI standard:	IEC 61131-9	
Profiles:	Smart Sensor	
SIO mode:	yes	
Devices type:	Class A	
Process data variable:	1	
Binary data channel:	2	
Min. process cycle time [ms]	2.5	
Device ID:	0X071	
EMV /ESD	EN 61000-4-2 ESD	4 kV CD / 8 kV AD
	EN 61000-4-3 HF radiated	10 V/m
	EN 61000-4-4 Burst	2 kV
	EN 61000-4-5-Surge	1/2 kV
	EN 61000-4-6 HF conducted	10 V
Shock resistance	DIN EN 60028-2-27	50 g (11 ms)
Vibrations resistance	DIN EN 60028-2-26	20 g (10...2000 Hz)

Electronic Dual Differential Pressure Switch

Pressure Ranges

Pressure Range Code	Differential Pressure	Proof Pressure	Proof Pressure	Common Pressure
[bar]	P1>P2 [bar]	P1>P2 [bar]	P2>P1 [bar]	P1=P2 [bar]
0.35	0-0,35	0.7	0.35	200
0.7	0-0,7	1.5	0.7	200
1	0-1	2	1	200
2	0-2	4	2	200
3.5	0-3,5	7	3.5	200
7	0-7	14	7	200
10	0-10	20	10	200
20	0-20	40	10	200
35	0-35	70	10	200

Dimensions (mm / inch)



Order Code

BDS3						Base Model*
						BDS3000
						Output
1						2 switch points
2						4...20mA 1 switch point
3						0...10V 1 switch point
4						4...20mA 2 switch points
5						0...10V 2 switch points
7						IO-Link / 2 switch points (PNP, NPN, PP)
8						IO-Link / 2 switch points (PNP, NPN, PP) / Analog Output
						Process Connection
5						G1/4" internal thread
F						1/4" NPT female
						Sealing
V						FKM
E						EPDM
						Electrical Connection
M						M12
						Range
	0.35B					0 ... 0.35 bar
	0.70B					0 ... 0.7 bar
	0001B					0 ... 1 bar
	0002B					0 ... 2 bar
	3.50B					0 ... 3.5 bar
	0007B					0 ... 7 bar
	0010B					0 ... 10 bar
	0020B					0 ... 20 bar
	0035B					0 ... 35 bar
	0005P					0 ... 5 psi
	0010P					0 ... 10 psi
	0015P					0 ... 15 psi
	0030P					0 ... 30 psi
	0050P					0 ... 50 psi
	0100P					0 ... 100 psi
	0150P					0 ... 150 psi
	0300P					0 ... 300 psi
	0500P					0 ... 500 psi
						Sensor element
					P	Piezoresistive sensor
BDS3	X	X	X	X	XXXXX	X

* Other configurations are available upon request.

Accessories

Order Number	Description
907-0357	Plug connector M12 x 1, 4-pin, with screw terminals, angled (IP65)
907-0185	Plug connector M12 x 1, 5-pin, with screw terminals, angled (IP65)
908-0361	Plug connector M12 x 1, 5-pin, with moulded cable, (IP67), 2 m length

BTS3000

- ▶ Measuring ranges: 0... 100° to -30 ... 140°C
- ▶ Sensor element: PT100
- ▶ Probe length: 17 – 650 mm
- ▶ IO-Link compatible



Temperature

Electr. Dual Temperature Switch

BTS3000

Features

- ▶ Measuring ranges: 0 ...100 °C to -30 ... 140 °C
- ▶ max. 2 switch points
- ▶ Analog output 4 - 20 mA or 0 - 10 V
- ▶ Rotatable 320° display & electrical connection
- ▶ Menu navigation refers to VDMA standard
- ▶ IO-Link communication interface

Applications

- ▶ Temperature control for
 - Hydraulics & Pneumatics
 - Lubrication systems
 - Cooling



Technical Data

Sensor element:	PT100 Class A DIN/IEC 60751
Materials:	
Wetted parts:	Stainless steel
Electronics housing:	Stainless steel, PBT, PA6.6 GF30
Seals:	FKM, EPDM
Operating elements:	3 easy-response pushbuttons
System of protection:	IP65, IP67
Protection class:	III
Electrical connection:	Plug M12 x 1, 4-pin / 5-pin / 8-pin (depending on output code)
Process connection:	see order code
Dimensions:	110 x 41 mm (without plug connector and probe)
Weight:	approx. 200 g
A/D converter:	
Resolution:	12 bit (4096 steps per measuring span)
Scanning rate:	1000 / s
Linearity error:	< ± 0.5 % v. f. s. at +25 °C
Temperature influence:	< ± 0.2 % FSO / 10K
Compensation range:	-10 °C... +70 °C
Repeatability:	± 0.1 % v. f. s
Time constant $T_{0.9}$:	40 sec
Max. pressure:	200 bar
Temperature range:	
Electronics:	-10 °C... +60 °C
Storage:	-30 °C... +80 °C
Power supply:	15... 28 V DC, output code 6: 20... 28 V DC reversed polarity protected (SELV, PELV)
Digital display:	4-digit 14-segment LED display, red, digit height 9 mm
Error display:	LED red and alphanumeric display
Power consumption:	approx. 50 mA (without load) output code 6: approx. 80 mA
Relay output:	Rel. 1 normally closed, Rel. 2 normally open Load: max. 1A, max 60 V, max. 30 W
Analog output:	
Current output:	4...20 mA
Load:	max. $R_I = (U_b - 12V) / 20 \text{ mA}$ $R_I = 600 \text{ Ohm}$ at $U_b = 24 \text{ V DC}$
Scanning rate:	2 ms
Voltage output:	0...10 V DC
Rating:	max. 10 mA
Adjustment range:	25 %... 100 % f. s.

Transistor switching outputs / IO-Link:											
Switching function:	Normally open/normally closed, standard / window mode and diagnosis function adjustable										
Adjustment range for switching point and hysteresis:	0 %... 125 % f. s.										
Switching frequency:	max. 100 Hz										
Load:	max. 500 mA, short-circuit proof, IO-Link: max. 250 mA										
Delay:	0.0 s ... 50 s adjustable										
Status display(s):	LED(s) red										
Interfaces:											
Communication interface:	IO-Link										
Transmission type:	COM2 (38,4 kBaud)										
IO-Link revision:	1.1										
SDCI standard:	IEC 61131-9										
Profiles:	Smart Sensor										
SIO mode:	yes										
Device type:	Class A										
Process data variable:	1										
Binary data channel:	2										
Min. process cycle time [ms]	2.5										
Device ID:	0x031...										
EMV / ESD	<table border="1"> <tr> <td>EN 61000-4-2 ESD</td> <td>4 kV CD / 8 kV AD</td> </tr> <tr> <td>EN 61000-4-3 HF radiated</td> <td>10 V/m</td> </tr> <tr> <td>EN 61000-4-4 Burst</td> <td>2 kV</td> </tr> <tr> <td>EN 61000-4-5-Surge</td> <td>1/2 kV</td> </tr> <tr> <td>EN 61000-4-6 HF conducted</td> <td>10 V</td> </tr> </table>	EN 61000-4-2 ESD	4 kV CD / 8 kV AD	EN 61000-4-3 HF radiated	10 V/m	EN 61000-4-4 Burst	2 kV	EN 61000-4-5-Surge	1/2 kV	EN 61000-4-6 HF conducted	10 V
EN 61000-4-2 ESD	4 kV CD / 8 kV AD										
EN 61000-4-3 HF radiated	10 V/m										
EN 61000-4-4 Burst	2 kV										
EN 61000-4-5-Surge	1/2 kV										
EN 61000-4-6 HF conducted	10 V										
Shock resistance:	DIN EN 60028-2-27 50 g (11 ms)										
Vibrations resistance:*	DIN EN 60028-2-26 20 g (10...2000 Hz)										
Approvals:	cULus ¹⁾ - E302981										

¹⁾ not for option output Code 6

Temperature

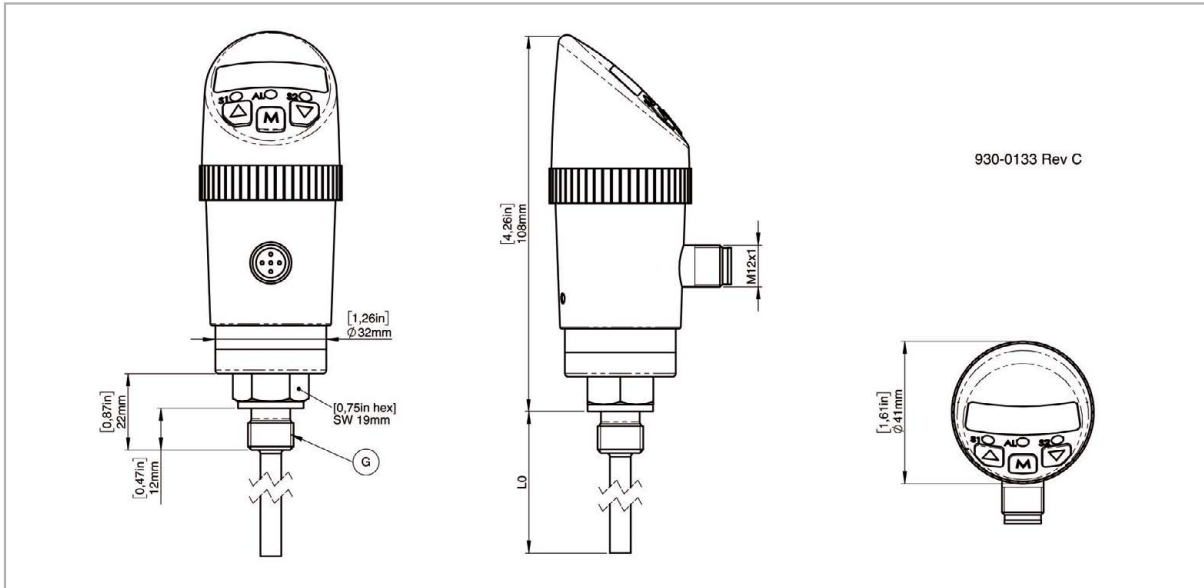
Electr. Dual Temperature Switch

BTS3000

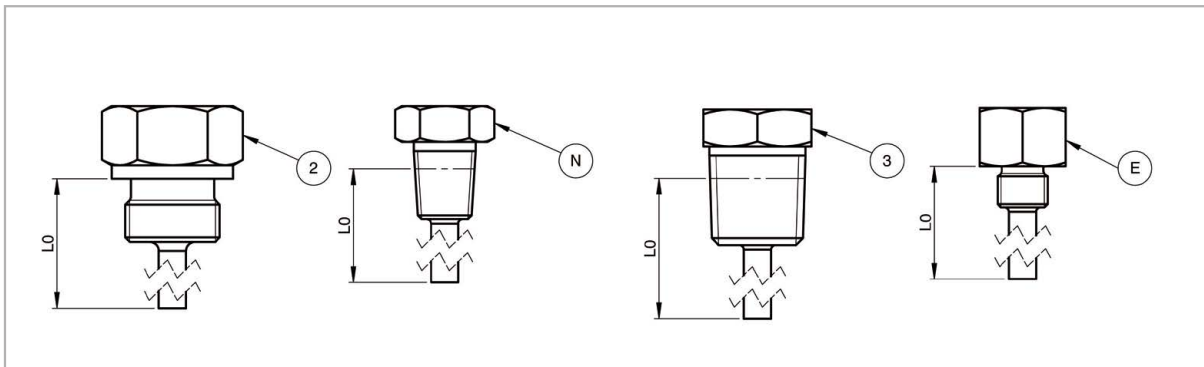
Accessories

Order Number	Description
907-0357	Plug connector M12 x 1, 4-pin, with screw terminals, angled (IP65)
907-0185	Plug connector M12 x 1, 5-pin, with screw terminals, angled (IP65)
908-0361	Plug connector M12 x 1, 5-pin, with moulded cable (IP67), 2 m length
908-0544	Plug connector M12 x 1, 8-pin, with moulded cable (IP67), 2 m length

Dimensions (mm / inch)



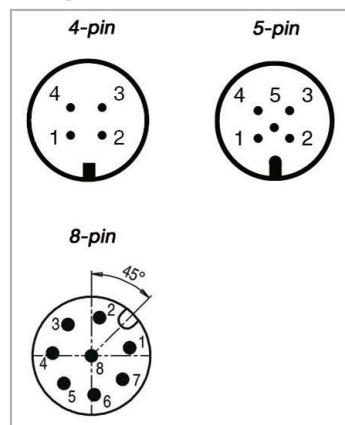
Process connection



Legend

G	G1/4"
2	G1/2"
N	1/4" NPT
3	1/2" NPT
E	7/16-20 UNF (SAE)

Plug



Electrical Connection

Pin	Signal Output Code 1, 7	Signal Order Code 2, 3	Signal Output Code 4, 5, 8	Signal Order Code 6
1	+Ub	+Ub	+Ub	+Ub
2	SP2	Signal	Signal	SP1a
3	0V	0V	0V	SP1b
4	SP1 / IO-Link*	SP1	SP1 / IO-Link*	0V
5	-	-	SP2	SP2a
6	-	-	-	SP2b
7	-	-	-	-
8	-	-	-	Housing

* only code 7 and 8

Order Code

BTS3000

BTS3

Base Mode

Output

1	2 switch points
2	4...20 mA - 1 switch point
3	0...10 V 1 - switch point
4	4...20 mA - 2 switch points
5	0...10 V 2 - switch points
6	2 relais switch points (1x NO SPST / 1 x NC SPST)
7	IO-Link / 2 switch points (PNP, NPN, PP)
8	IO-Link / 2 switch points (PNP, NPN, PP) / Analog Output

Process Connection

G	G1/4" ext. thread Sealing Code V, E and F)
2	G1/2" ext. thread (Sealing Code V, E and F)
N	1/4" NPT ext. thread (Sealing Code X)
3	1/2" NPT ext. thread (Sealing Code X)
E	7/16...20 UNF ext. thread (Sealing Code V, E, and F)

Sealing

V	FKM
E	EPDM
F	FFKM on request
X	No Sealing
	other on request

Electrical Connection

M M12

Probe length*

0 0 1 7 M	17 mm (Process Connection Code G and 2)
0 0 2 5 M	25 mm (Process Connection Code G and 2)
0 0 5 0 M	50 mm (Process Connection Code G and 2)
0 1 0 0 M	100 mm (Process Connection Code G and 2)
0 3 0 0 M	300 mm (Process Connection Code G and 2)
0 6 5 0 M	650 mm (Process Connection Code G and 2)
0 . 7 0 Z	0,7 in (Process Connection Code N, 3 and E)
2 . 0 0 Z	2 in (Process Connection Code N, 3 and E)
4 . 0 0 Z	4 in (Process Connection Code N, 3 and E)
6 . 0 0 Z	6 in (Process Connection Code N, 3 and E)
1 2 . 0 Z	12 in (Process Connection Code N, 3 and E)
	other on request

Temperature Range

1	0 ... 100°C
2	-30 ... 140°C
3	32 ... 210°F
4	-22 ... 280°F

BTS3 3 G V M 0 0 1 7 M 2

* If probe length >100 mm shock and vibration values can deviate - depending on application.

If probe length >300 mm keep away the flow from the probe.

If probe length < 25 mm linearity error and time constante values can deviate - depending on application.

BLS2000

- ▶ Resolution: 8 or 12 mm
- ▶ Direct measurement
- ▶ Total length (L0): 250 – 3000 mm
- ▶ IO-Link compatible



Level

Electr. Dual Level Switch

BLS2000

- ▶ Resolution: 8 or 12 mm
- ▶ Redundant measurement system
- ▶ Direct measurement
- ▶ Capable of measuring media of density > 0.6g/cm³ that is compatible with float material e.g. hydraulic oils, water, coolants even with foaming
- ▶ Total length (L0): 250 - 3000 mm
- ▶ Max. 2 switch points
- ▶ Analog output 4 - 20 mA or 0 - 10 V
- ▶ Rotatable 320° display & electrical connection
- ▶ Menu navigation refers to VDMA standard

Applications

- ▶ Level control for
 - Hydraulics
 - Lubrication system
 - Cooling



Technical Data

Sensor element:	Reed switch
Materials:	
Wetted parts:	
Stem (Fitting, Tube):	Brass
Float:	NBR foam
Seals:	FKM, EPDM or NBR
Electronics housing:	Stainless steel, mat. no. VA2A, PA / PC
Operating elements:	3 easy-response pushbuttons
System of protection:	IP65/IP67
Protection class:	III
Electrical connection:	Plug M12 x 1 mm, 4-pin / 5-pin (depending on output code)
Process connection:	see order code
Float BN30	
Density Medium:	min. 0.60 g/cm ³
Depth of immersion:	20 ± 2 mm at density 1, Ø30 mm, height 44 mm
Dimension:	110 x 41 mm (without plug connector and probe)
Weight:	approx. 350 g, without probe
Total length (L0):	250 mm, 370 mm, 410 mm, 1000 mm others on request
Repeatability:	± 1 digit (without turbulence) including temperature influence
Resolution:	8 or 12 mm
Max. pressure:	15 bar
Temperature range:	
Medium:	-25 °C... +80 °C
Ambient:	-20 °C... +70 °C
Storage:	-30 °C... + 80 °C
Power supply:	15... 32 V DC, reversed polarity protected (SELV, PELV)
Digital display:	4-digit 14-segment LED display, red, digit height 9 mm
Error display:	LED red and alphanumeric display
Power consumption:	approx. 50 mA (without load)
Analog output:	
Current output:	4...20 mA
Load:	max. RI = (Ub-12V) / 20 mA RI = 600 Ohm at Ub = 24 V DC
Scanning rate:	2 ms
Voltage output:	0...10 V DC
Rating:	max. 10 mA
Adjustment range:	25 %... 100 % f. s.

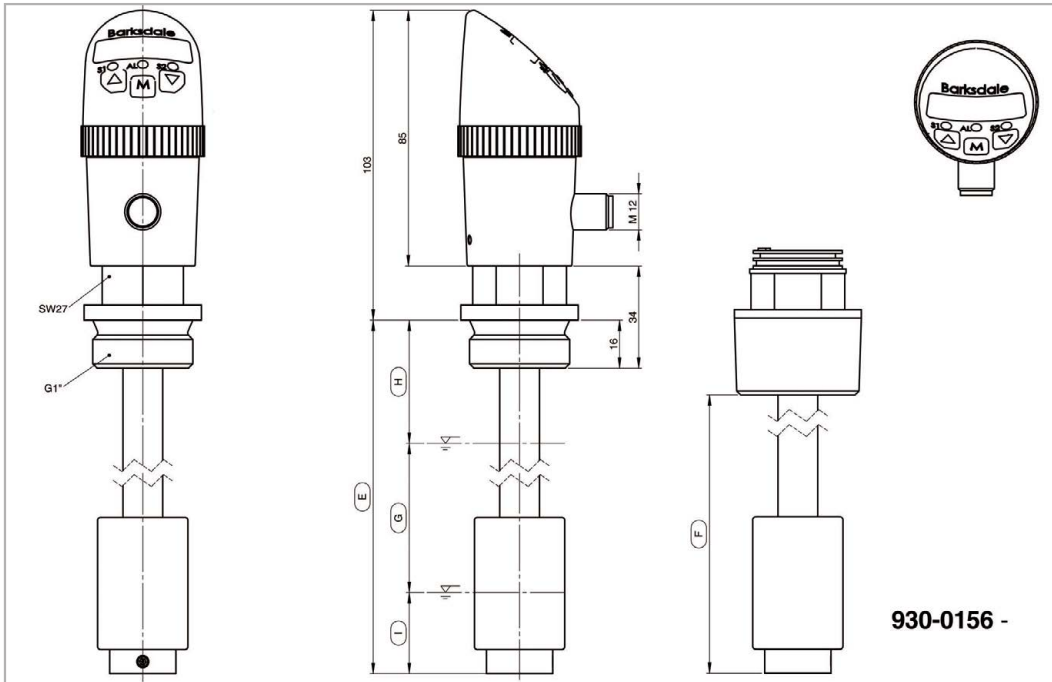
Units:		
Distance:	%, mm, cm, m, inch, feet,	
Volume:	liter, m ³ , gallon	
Transistor switching outputs / IO-Link:		
Switching function:	Normally open/normally closed, standard / window mode and diagnosis function adjustable	
Adjustment range for switching point and hysteresis:	0 %... 125 % f. s.	
Switching frequency:	max. 100 Hz	
Load	max. 500 mA, short-circuit proof IO-Link: max. 250 mA	
Delay	0.0 s ... 50 s adjustable	
Status display(s):	LED(s) red	
Interfaces		
Communication interface:	IO-Link	
Transmission type:	COM2 (38,4 kBaud)	
IO-Link revision:	1.1	
SDCI standard:	IEC 61131-9	
Profiles:	Smart Sensor	
SIO mode:	yes	
Device type:	Class A	
Process data variable:	1	
Binary data channel:	2	
Min. process cycle time [ms]	2.5	
Device ID:	0x051 ...	
EMV	EN 61000-4-2 ESD	4 kV CD/8 kV AD
	EN 61000-4-3 HF radiated	10 V/m
	EN 61000-4-4 Burst	2 kV
	EN 61000-4-5-Surge	1/2 kV
	EN 61000-4-6 HF conducted	10 V
Shock resistance	DIN EN 60028-2-27	50 g (11 ms)
Vibrations resistance	DIN EN 60028-2-26	20 g (10...2000 Hz)
Approvals:	on request	

Electr. Dual Level Switch

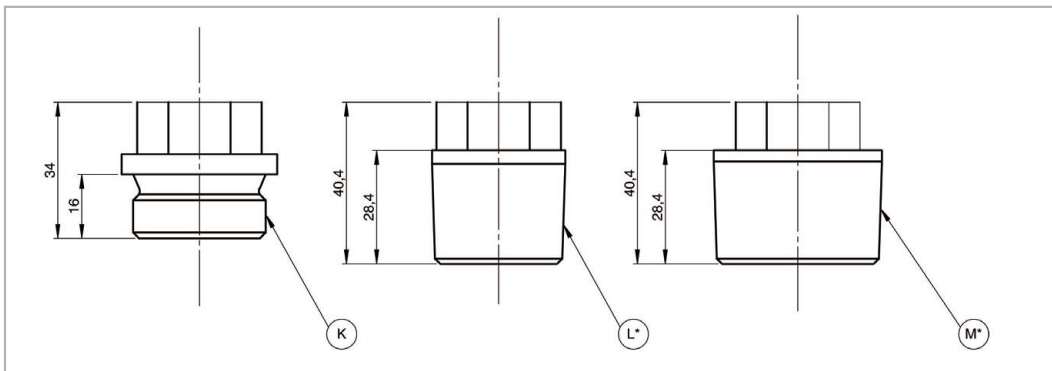
Accessories

Order Number	Description
907-0357	Plug connector M12 x 1, 4-pin, with screw terminals, angled (IP65)
907-0185	Plug connector M12 x 1, 5-pin, with screw terminals (IP65)
908-0361	Plug connector M12 x 1, 5-pin, with moulded cable (IP67), 2 m length

Dimensions (mm / inch)



Process connection

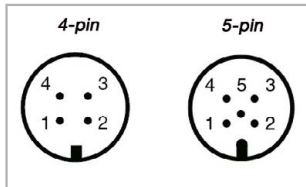


Legend

E	L0 = total length for G&M threads
F	L0 = total length for NPT threads
G	LM = L0 -(To+Tu)
H	To = dead band top
I	Tu = dead band bottom

Fitting	Dead band	
	To (top)	Tu (bottom)
G1"	41 ±3 [1.22 ±0.12]	27 ±3 [1.06 ±0.12]
1" NPT	25 ±3 [0.51 ±0.12]	
1 1/4" NPT		

Plug



Electrical Connection

Pin	Signal Order Coder 1,7, A, G	Signal Order Code 2, 3, B, C	Signal Order Code 4, 5, 8, D, E, H
1	+Ub	+Ub	+Ub
2	SP2	Signal	Signal
3	0V	0V	0V
4	SP1 / IO-Link*	SP1	SP1 IO-Link*
5	-	-	SP2

* only code 7, 8, G and H

Order Code

BLS2000

BLS2

Base Model*

Output

8-mm resolution

1

2

3

4

5

7

8

12-mm resolution

A

B

C

D

E

G

H

2 switch points

4...20 mA and 1 switch points

0...10 V DC and 1 switch points

4...20 mA and 2 switch points

0...10 V DC and 2 switch points

IO-Link / 2 switch points (PNP, NPN, PP)

IO-Link / 2 switch points (PNP, NPN, PP) / Analog Output

Process Connection

K

L*

M*

G1" male

1"NPT male, without sealing (sealing code X)

1¼"NPT male, without sealing (sealing code X)

Sealing

X

V*

E*

B*

without sealing

FKM (DIN 3869)

EPDM (DIN 3869)

NBR (DIN 3869)

Electrical Connection

M

M12 x 1 mm (4 / 5 pin)

Total Length L0

0 2 5 0 M 250 mm

0 3 7 0 M 370 mm

0 4 1 0 M 410 mm

1 0 0 0 M 1000 mm

0 9 . 8 Z 9.8 inch

1 4 . 6 Z 14.6 inch

1 6 . 1 Z 16.1 inch

3 9 . 4 Z 39.4 inch

Example:

BLS2

D

K

X

M

0 4 1 0 M

*Special design upon request

BLS3000

- ▶ Resolution: 5 mm
- ▶ Direct measurement
- ▶ Total length (L0): 250 – 1000 mm
- ▶ IO-Link compatible



Level

Electr. Dual Level Switch

BLS3000

Features

- ▶ Resolution: 5 mm
- ▶ Redundant measurement system
- ▶ Direct measurement
- ▶ Capable of measuring media of density > 0.6g/cm³ that is compatible with float material e.g. hydraulic oils, water, coolants even with foaming
- ▶ Total length (L0): 250 - 1000 mm
- ▶ Max. 2 switch points
- ▶ Analog output 4 - 20 mA or 0 - 10 V
- ▶ Rotatable 320° display & electrical connection
- ▶ Menu navigation refers to VDMA standard

Applications

- ▶ Level control for
 - Hydraulics
 - Lubrication system
 - Cooling



Technical Data

Sensor element:	Reed switch
Materials:	
Wetted parts:	
Stem (Fitting, Tube):	Stainless steel
Float:	NBR foam
Seals:	FKM, EPDM or NBR
Electronics housing:	Stainless steel, PBT
Operating elements:	3 easy-response pushbuttons
System of protection:	IP65/IP67
Protection class:	III
Electrical connection:	Plug M12 x 1 mm, 4-pin / 5-pin (depending on output code)
Process connection:	see order code
Float BN17	
Density Medium:	min. 0.60 g/cm ³
Depth of immersion:	15 ± 2 mm (water), 19 ± 2 mm (oil 0.75) Ø17.8 mm, height 25 mm
Dimension:	110 x 41 mm (without plug connector and probe)
Weight:	approx. 350 g
Total length (L0):	250 mm, 370 mm, 410 mm, 1000 mm others on request
Repeatability:	± 1 digit (without turbulence) including temperature influence
Resolution:	5 mm
Max. pressure:	3 bar
Temperature range:	
Medium:	-25 °C... +80 °C
Ambient:	-20 °C... +70 °C (1)
Storage:	-30 °C... + 80 °C
Power supply:	15... 32 V DC, reversed polarity protected (SELV, PELV)
Digital display:	4-digit 14-segment LED display, red, digit height 9 mm
Error display:	LED red and alphanumeric display
Power consumption:	approx. 50 mA (without load)
Analog output:	
Current output:	4...20 mA
Load:	max. RI = (Ub-12V) / 20 mA RI = 600 Ohm at Ub = 24 V DC
Scanning rate:	2 ms
Voltage output:	0...10 V DC
Rating:	max. 10 mA
Adjustment range:	25 %... 100 % f. s.

Units:		
Distance:	% , mm, cm, m, inch, feet,	
Volume:	liter, m ³ , gallon	
Transistor switching outputs / IO-Link:		
Switching function:	Normally open/normally closed, standard / window mode and diagnosis function adjustable	
Adjustment range for switching point and hysteresis:	0 %... 125 % f. s.	
Switching frequency:	max. 100 Hz	
Load	max. 500 mA, short-circuit proof IO-Link: max. 250 mA	
Delay	0.0 s ... 50 s adjustable	
Status display(s):	LED(s) red	
Interfaces		
Communication interface:	IO-Link	
Transmission type:	COM2 (38,4 kBaud)	
IO-Link revision:	1.1	
SDCI standard:	IEC 61131-9	
Profiles:	Smart Sensor	
SIO mode:	yes	
Device type:	Class A	
Process data variable:	1	
Binary data channel:	2	
Min. process cycle time [ms]	2.5	
Device ID:	0x051 ...	
EMV	EN 61000-4-2 ESD	4 kV CD/8 kV AD
	EN 61000-4-3 HF radiated	10 V/m
	EN 61000-4-4 Burst	2 kV
	EN 61000-4-5-Surge	1/2 kV
	EN 61000-4-6 HF conducted	10 V
Shock resistance	DIN EN 60028-2-27	50 g (11 ms)
Vibrations resistance	DIN EN 60028-2-26	20 g
		(10...2000 Hz)
Approvals:	cULus ⁽¹⁾ - E302981	

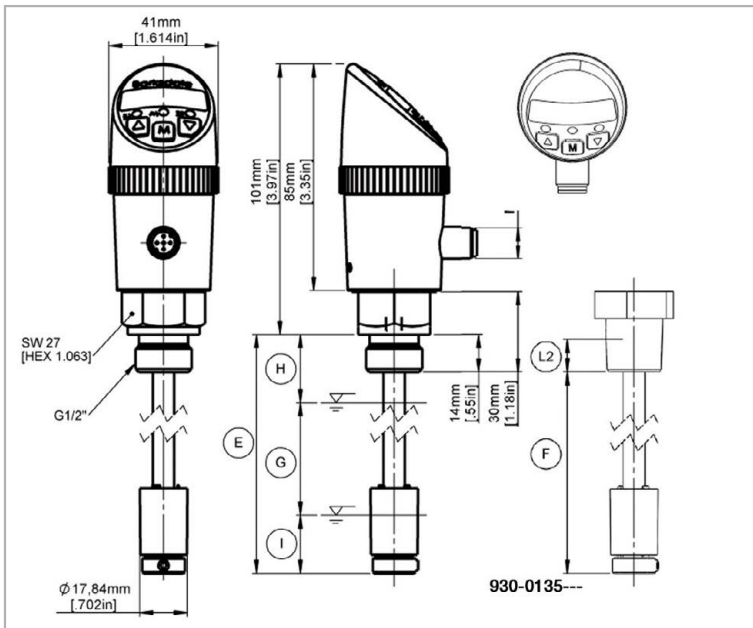
1) Conditions of use with cULus: 60 °C max. ambient, power supply 28 V DC

Electr. Dual Level Switch

Accessories

Order Number	Description
907-0357	Plug connector M12 x 1, 4-pin, with screw terminals, angled (IP65)
907-0185	Plug connector M12 x 1, 5-pin, with screw terminals (IP65)
908-0361	Plug connector M12 x 1, 5-pin, with moulded cable (IP67), 2 m length

Dimensions (mm / inch)

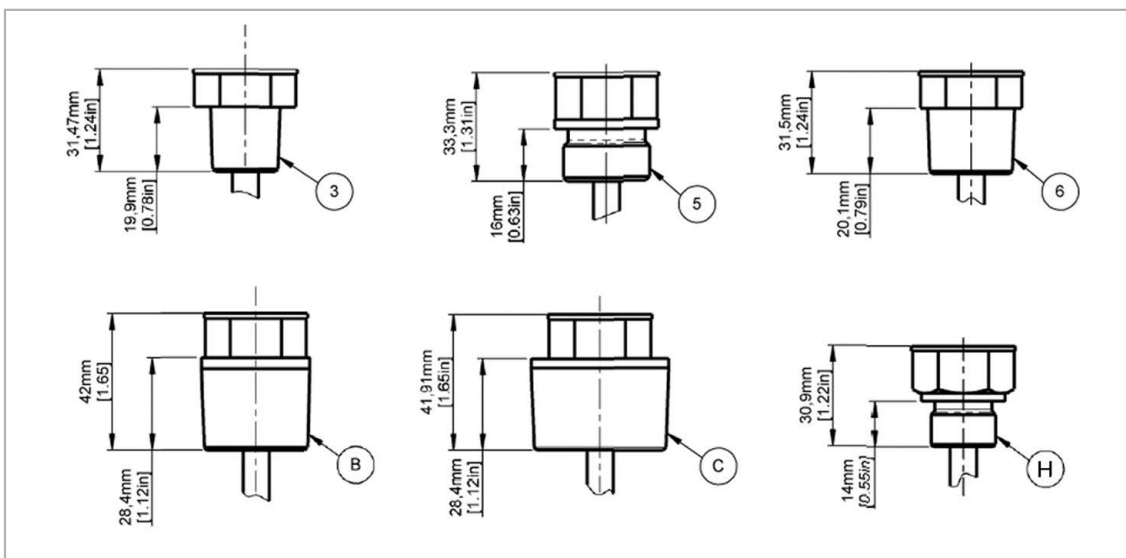


Fitting	Dead band	
	To (top)	Tu (bottom)
G1/2"	27 ±3 [1.06 ±0.12]	27 ±3 [1.06 ±0.12]
G3/4"	29 ±3 [1.14 ±0.12]	
G1"	31 ±3 [1.22 ±0.12]	
M20x1,5 mm	27 ±3 [1.06 ±0.12]	
1/2"NPT	13 ±3 [0.51 ±0.12]	
3/4"NPT		
1"NPT		
1 1/4"NPT		

Legend

E	L0 = total length for G&M threads
F	L0 = total length for NPT threads
L2	the effective length of 1/2" NPT, 3/4" NPT, 1" NPT and 1 1/4" NPT thread
G	LM = L0-(To+Tu)
H	To = dead band top
I	Tu = dead band bottom

Process connection

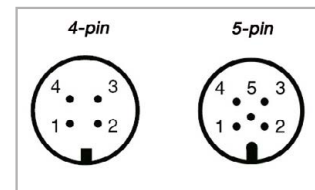


Electrical Connection

Pin	Signal Order Code 1, 7	Signal Order Code 2, 3	Signal Order Code 4, 5, 8
1	+Ub	+Ub	+Ub
2	SP2	Signal	Signal
3	0V	0V	0V
4	SP1 / IO-Link*	SP1	SP1 IO-Link*
5	-	-	SP2

* only code 7 and 8

Plug



Order Code

BLS3000

BLS3000

Base Model*

Output

5-mm resolution

1	2 switch points
2	4...20 mA and 1 switch point
3	0...10 V DC and 1 switch point
4	4...20 mA and 2 switch points
5	0...10 V DC and 2 switch points
7	IO-Link / 2 switch points (PNP, NPN, PP)
8	IO-Link / 2 switch points (PNP, NPN, PP) / Analog Output

Process Connection

2	G $\frac{1}{2}$ " male, with sealing (sealing code V, E or B)
3	$\frac{1}{2}$ "NPT male, without sealing (sealing code X)
5	G $\frac{3}{4}$ "NPT male, with sealing (sealing code V, E or B)
6	$\frac{3}{4}$ "NPT male, without sealing (sealing code X)
B	1"NPT male, without sealing (sealing code X)
C	1 $\frac{1}{4}$ "NPT male, without sealing (sealing code X)
H	M20 x 1,5 mm male, with sealing (sealing code V, E or B)

Sealing

X	without sealing (NPT process connection only)
V	FKM (DIN 3869)
E	EPDM (DIN 3869)
B	NBR (DIN 3869)

Electrical Connection

M M12 x 1 mm (4, 5 pin)

Total Length L0

0	2 5 0 M	250 mm (process con. code 2, 5 and H)
0	3 7 0 M	370 mm (process con. code 2, 5 and H)
0	4 1 0 M	410 mm (process con. code 2, 5 and H)
1	0 0 0 M	1000 mm (process con. code 2, 5 and H)
0	9 . 8 Z	9.8 inch (process con. code 3, 6, B and H)
1	4 . 6 Z	14.6 inch (process con. code 3, 6, B and C)
1	6 . 1 Z	16.1 inch (process con. code 3, 6, B and C)
3	9 . 4 Z	39.4 inch (process con. code 3, 6, B and C)

Example:

BLS3000 **1** **2** **B** **M** **0** **3** **7** **0** **M**

*Special design on request

Electr. Temperature Switch & Level Switch

BTLS2000

Features

- ▶ Measuring ranges: 0 ... 100 °C to 30 ... 140 °C
- ▶ Max. 4 outputs
- ▶ 1 or 2 level setpoint, fixed set points depending on configuration
- ▶ Rotatable 320° display & electrical connection
- ▶ Menu navigation refers to VDMC standard

Applications

Temperature & Level control for

- ▶ Hydraulics
- ▶ Cooling Systems



Technical Data

Sensor element: Temp.	PT100 Class A DIN/IEC 60751
Sensor element: Level	Reed switch
Materials:	
Wetted parts:	NBR Foam, brass
Electronic housing:	Stainless steel, PBT
Seals:	FKM
Operating elements:	3 easy-response pushbuttons
System of protection:	IP65/IP67
Protection class:	III
Electrical connection:	Plug M12 x 1, 5-pin, 8-pin
Process connection:	M20 x 1,5
Dimensions:	110 x 41 mm (without plug connector and probe)
Weight:	approx. 250 g
Measuring ranges:	0 ...100 °C / 32 ... 210 °F
A/D converter:	
Resolution:	12 bit
Scanning rate:	(4096 steps per measuring span) 1000 / s
Linearity error:*	< ± 0.5 % v. f. s. at +25 °C
Temperature influence:*	< ±0.2 % FSO / 10K
Compensation range:*	-10 °C... +70 °C
Repeatability:*	± 0.1 % v. f. s.
Time constante T09:*	40 sec
Max. pressure:	3 bar
Temperature range:	
Electronics:	
Storage:	-10 °C ... +60 °C -30 °C ... +80 °C

Power supply:	15... 28 V DC, reversed polarity protected (SELV, PELV)	
Digital display:	4-digit 14-segment LED display, red, digit height 9 mm	
Error display:	LED red and alphanumeric display	
Power consumption:	approx. 50 mA (without load)	
Level switch output:	1 SPST, NO or 1 SPST, NO + 1 SPST, NC	
Contact rating:	24 V DC, 0.5 A	
Accuracy:	± 3 mm	
Transistor switching outputs PNP:		
Switching function:	Normally open/normally closed, standard / window mode and diagnosis function adjustable	
Adjustment range for switching point and hysteresis:	0 %... 125 % f. s.	
Switching frequency:	max. 100 Hz	
Load	max. 500 mA, short-circuit proof	
Delay	0.0 s ... 50 s adjustable	
Status display(s):	LED(s) red	
EMV	EN 61000-4-2 ESD	4 kV CD / 8 kV AD
	EN 61000-4-3 HF radiated	10 V/m
	EN 61000-4-4 Burst	2 kV
	EN 61000-4-5-Surge	1/2 kV
	EN 61000-4-6 HF conducted	10 V
Float BN18		
Density Medium:	min. 0.66 g/cm ³	
Depth of immersion:	16 ± 2 mm (water), 18 ± 2 mm (oil)	

* only Temperature switches

Accessories

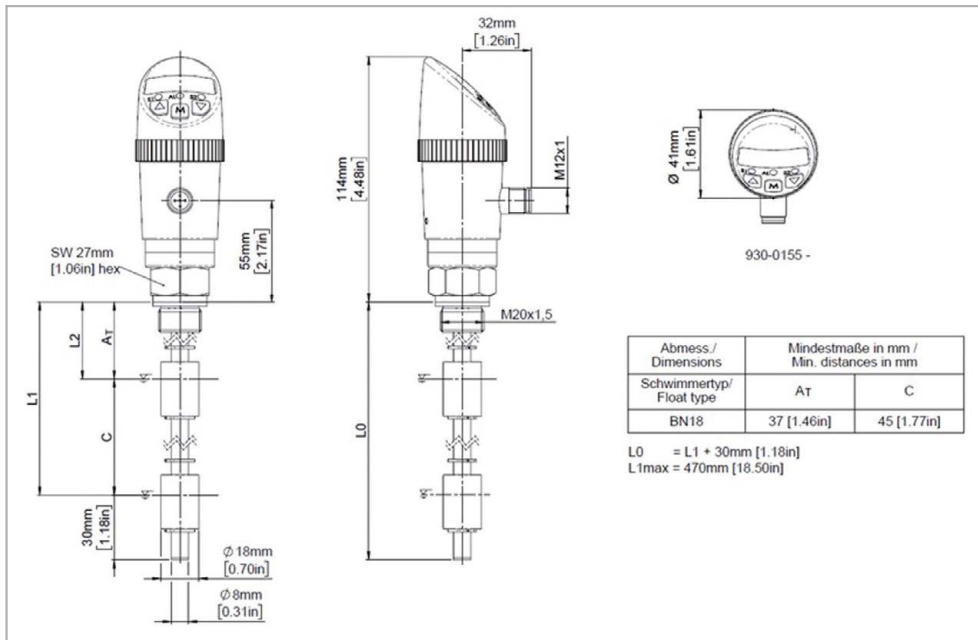
Order Number	Description
907-0185	Plug connector M12 x 1, 5-pin, with screw terminals (IP65)
908-0361	Plug connector M12 x 1, 5-pin, with sharpened cable (IP67)

Temperature

Electr. Temperature Switch & Level Switch

BTLS2000

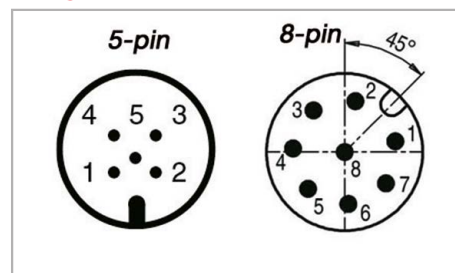
Dimensions (mm / inch)



Electrical Connection

Pin	5-pin	8-pin
1	VCC	VCC
2	SP1 Level	Analog Temperature
3	GND	GND
4	SP1 Temperature	SP1 Temperature
5	SP2 Temperature	SP2 Temperature
6	-	SP1 Level
7	-	SP2 Level
8	-	-

Plug



Order Code

BTLS2	Base Model
1	2 switch points temp.
4	4...20 mA 2 switch points temp.
5	0...10 V 2 switch points temp.
Process Connection	
D	M20 x 1,5 mm male, with sealing (sealing code V, E or B)
Sealing	
V	FKM (DIN 3869)
E	EPDM (DIN 3869)
B	NBR (DIN 3869)
Temperature Range	
1	0...100°C
2	-30...140°C
3	32...210°F
4	-22...280°F
Level Switchpoint 1 (L1) (NO)	
XXX	Length 0 ... XXX mm (0...XX inch) (L0 = L1+30mm)
Level Switchpoint 2 (L2) (NC)	
XXX	Length 0 ... XXX mm (0...XX inch) (L2 max. = L1-45mm, L2 min = 37mm)
Example	
BTLS2 1 D V 1 180 100	

Real performance

The Barksdale product range is comprehensive. In addition to electronic switches we offer a comprehensive range of mechanical solutions. A brief overview:

Pressure

The compact

- ▶ Measuring ranges: 0,6 ... 600 bar / 2 ... 400 bar
- ▶ CETOP connection 40 x 40 mm (8000 series) or 30 x 30 mm Front (Series 9000)
- ▶ Modular design
- ▶ 100% functional test
- ▶ Protection class IP65/IP68
- ▶ Models with the following approvals available: Ex ia, cULus, Lloyd's Register, RINA, BV, ABS, SIL3, EAC-Ex

Applications:

OEM applications, mobile and industrial hydraulics, test bench, drilling equipment, press control, heavy industry, shipbuilding



The classics

- ▶ Measuring ranges: Metal Diaphragm Pressure Switch (DT): -0.006 ... -1 bar (vacuum) and 0.005 ... 10.3 bar, Bourdon tube Pressure switch (BT): 4.8... 950 bar
- ▶ Extremely precise switching system
- ▶ Protection class IP65
- ▶ Switching point during the operation with reference instrument adjustable
- ▶ Models with the following approvals available: Ex ia, cULus, DNV-GL, SIL3, EAC-Ex

Applications:

Machine and tool construction, pump control, refrigerant monitoring, chemical industry, shipbuilding

The Ex-protected

- ▶ Measuring ranges: Metal Diaphragm Pressure Switch (DX): -0.0006... -1 bar (vacuum) and 0.012... 10.3 bar Bourdon tube Pressure switch (BX): 5.3... 496 bar
- ▶ High repetition accuracy
- ▶ Protection class IP65
- ▶ Switching point during the operation with reference instrument adjustable
- ▶ Stainless steel version
- ▶ Temperature range: -40 °C ... + 75 °C
- ▶ Models with the following approvals available: Ex ia, Ex d, cULus, DNV-GL, SIL3, EAC-Ex

Applications:

Chemical process industry, power plants, injection moulding, machine construction



Temperature

The robust ones for Ex applications

- ▶ Single switch T1X and double switch T2X with remote sensor
- ▶ Single switch L1X local mount type
- ▶ Setting ranges:
T1X/T2X: -45 °C ... + 66 °C
to +160 °C ... +316°C
L1X: -45 °C... +24 °C
to +160°C ... +232°C
- ▶ Flame proof housing
- ▶ Protection class IP65 and NEMA 4/7/9
- ▶ Switching point step less adjustable
- ▶ Models with the following approvals available:
Ex ia, Ex d, UL, CSA, SIL2, EAC-EX



Applications:

Temperature monitoring and control in industry, shipbuilding, rail vehicles, chemical and oil industry, offshore

Level



The Diverse

- ▶ Plastic, stainless steel and brass versions
- ▶ Max. lengths up to 3000 mm
- ▶ Max. Operating Temperature: -40 °C ... + 150°C
- ▶ Various float and thread designs
- ▶ IP65/IP67/IP68, (IP54 on request)
- ▶ Models with the following approvals available:
Ex ia, cULus, BV, DNV-GL, Lloyd Register, EAC-EX

Applications:

Mechanical engineering, mobile and industrial hydraulics, bilge monitoring, pump monitoring, shipbuilding, yacht building

Flow

The flexibles

- ▶ Measuring ranges:
0,0005 ... 0.06 l/ min to 35 ... 250 l/min for water
0,6 ... 2.2 NI/min to 200 ... 650 NI/min for gas
- ▶ High switching accuracy
- ▶ Switching point infinitely variable
- ▶ Models available with the following approvals:
EX ia, DNV-GL, ABS, EAC-EX



Applications:

Measurement and monitoring of liquids and gases, e.g. in cooling and hydraulic systems, measuring and testing equipment, pumps

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