

# Electr. Dual Level Switch

## BLS3000

### Features

- ▶ Resolution: 5 mm
- ▶ Redundant measurement system
- ▶ Direct measurement
- ▶ Capable of measuring media of density  $> 0.6\text{g/cm}^3$  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

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

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

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

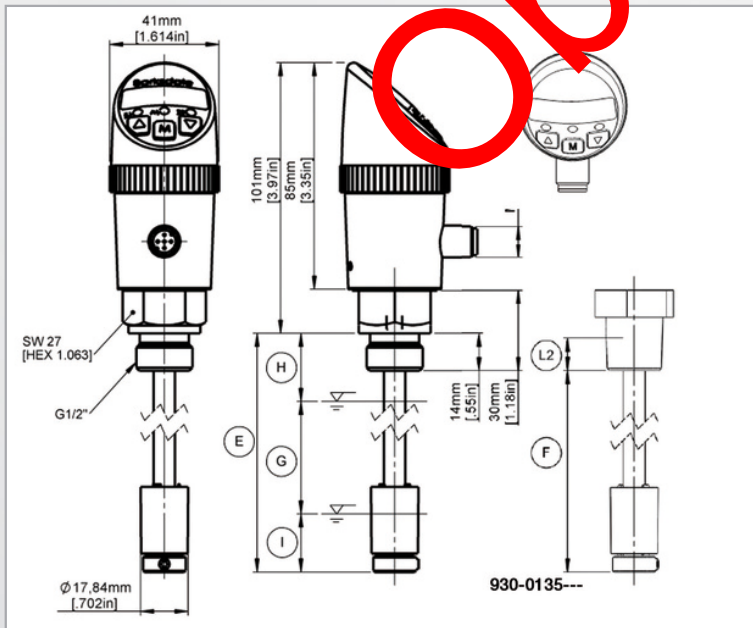
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**BLS3000**

## 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, 4-pin, with moulded cable (IP67), 2 m length

## Dimensions (mm / inch)

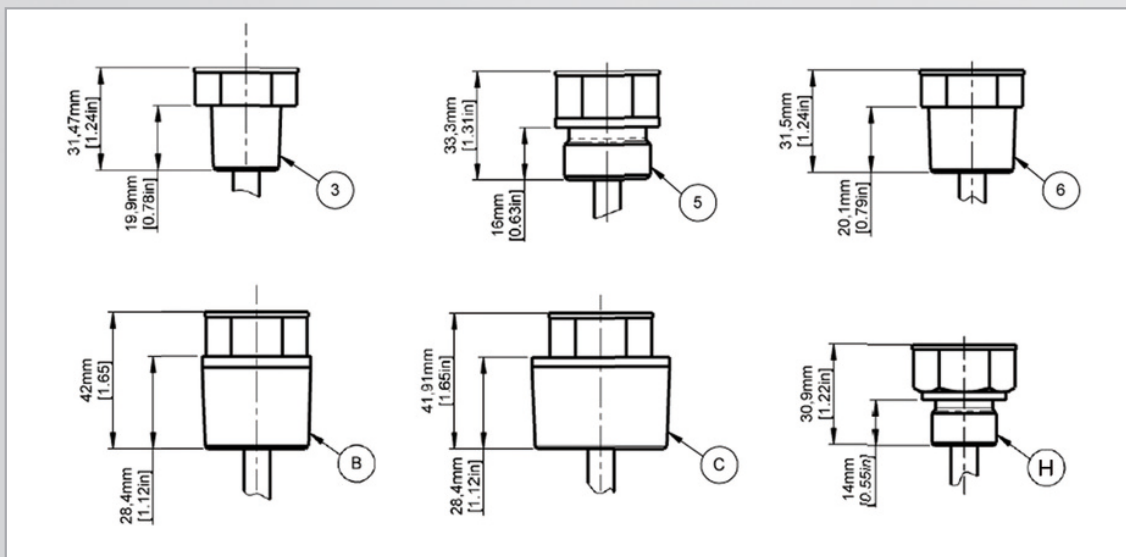


Fitting	Dead band	
	To (top)	Tu (bottom)
G1/2"	27 ±3 [1.06 ±0.12]	27 ±3 [1.06 ±0.12]
G3/4"	29 ±3 [1.14 ±0.12]	
G1"	31 ±3 [1.22 ±0.12]	
M20x1,5 mm	27 ±3 [1.06 ±0.12]	
1/2"NPT	13 ±3 [0.51 ±0.12]	
3/4"NPT		
1"NPT		
1 1/4"NPT		

## 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

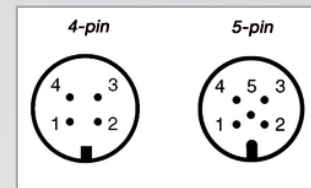


## Electrical Connection

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*
<b>Output</b>		
<b>5-mm resolution</b>		
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
<b>Process Connection</b>		
2		G½" male, with sealing (sealing code V, E or B)
3		½"NPT male, without sealing (sealing code X)
5		G¾" male, with sealing (sealing code V, E or B)
6		¾"NPT male, without sealing (sealing code X)
B		1"NPT male, without sealing (sealing code X)
C		1¼"NPT male, without sealing (sealing code X)
H		M20 x 1,5 mm male, with sealing (sealing code V, E or B)
<b>Sealing</b>		
X		without sealing (NPT process connection only)
V		FKM (DIN 3869)
E		EPDM (DIN 3869)
B		NBR (DIN 3869)
<b>Electrical Connection</b>		
M		M12 x 1 mm (4, 5 pin)
<b>Total Length L0</b>		
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