

## Electronic Dual Level Switch

## BLS3000

### Features

- ▶ Signal resolution: 1/5" (5 mm)
- ▶ Redundant measurement system ensures reliable output
- ▶ Total length (L0): 9.8"-39.4" (250 mm-1000 mm)
- ▶ One or two switch points
- ▶ Analog output: 4 - 20 mA or 0 - 10 V
- ▶ Rotatable 320° display & electrical connection
- ▶ Easy menu navigation

### Applications

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



### General Specifications\*

<b>Sensor element:</b>	Reed switch
<b>Materials:</b> Wetted parts: Stem (Fitting, Tube): Float: Seals: Electronic housing:	Stainless steel 316Ti NBR (BUNA-N) foam FKM, EPDM or NBR (BUNA-N) Stainless steel 316Ti, PBT, elastomer
<b>Operating elements:</b>	3 easy-response push-buttons
<b>Enclosure rating:</b>	Type 1 / Type 4X (IP65) / Type 6 (IP67)
<b>Protection class:</b>	III
<b>Electrical connection:</b>	Plug M12 x 1, 4-pin / 5-pin / 8-pin (depending on Output selection)
<b>Process connection:</b>	See Product Configurator for process connection options (page 2)
<b>Float BN17:</b> Density medium: Depth of immersion:	min. 0.02 lb/in <sup>3</sup> (0.60 g/cm <sup>3</sup> ) 0.59" ± 0.07" (15 ± 2 mm) (water) 0.74" ± 0.07" (19 ± 2 mm) (oil 0.75) Ø0.70", height 0.98" (Ø17.8 mm, height 25 mm)
<b>Dimensions enclosure:</b>	1.6 Ø x 4.5 inches (41 x 110 mm) For 1/2" NPT (without M12 connector or probe). Contact factory for other sizes.
<b>Weight:</b>	Approx. 0.77 lb (350 g) (for G1/2" size and 250 mm L0, for exact weight, contact factory)
<b>Total length (L0):</b>	9.8" (250 mm), 14.6" (370 mm), 16.1" (410 mm), others on request up to 39.4" (1000 mm)
<b>Accuracy:</b>	± 1 digit (without turbulence) including temperature influence and repeatability
<b>Resolution:</b>	1/5" (5 mm)
<b>Max. pressure:</b>	43.5 psi (3 bar)
<b>Temperature range:</b> Medium: Ambient/Operating: Storage:	-13 °F to +176 °F (-25 °C... +80 °C) -4 °F to +158 °F (-20 °C... + 70 °C) -22 °F to +176 °F (-30 °C... + 80 °C)
<b>Power supply:</b>	15 to 28 V DC, reversed polarity protected (SELV, PELV)
<b>Power consumption:</b>	Approx. 50 mA (without load) Approx. 80 mA (Output Code 6)

<b>Digital display:</b>	4-digit 14-segment LED display, red, digit height 0.35 inches (9 mm)	
<b>Error display:</b>	LED RED and alphanumeric display	
<b>Analog output:</b> Current output: Load: Scanning rate: Voltage output: Rating: Adjustment range:	4-20 mA max. RI = (Ub-12V) / 20 mA RI = 600 Ohm at Ub = 24 V DC 2 ms 0 to 10 V DC max. 10 mA 25% to 100% f. s.	
<b>Units:</b> Distance: Volume:	%, mm, cm, m, inch, feet, liter, m <sup>3</sup> , gallon	
<b>Transistor switching outputs:</b>		
<b>Switching function:</b>	Normally open/normally closed, standard / window mode and adjustable functions	
<b>Switching output:</b>	PNP	
<b>Adjustment range for switching point and hysteresis:</b>	0 % to 125 % f. s.	
<b>Switching frequency:</b>	Max. 100 Hz	
<b>Load</b>	Max. 500 mA, short-circuit proof	
<b>Delay</b>	0.0 s to 50 s adjustable	
<b>Status display(s):</b>	LED(s) red	
<b>EMI:</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>	

<sup>1</sup> Conditions of use: 140 °F (60 °C) max. ambient, power supply max. 28 V DC

\* See product configurator for additional options.

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## Technical Drawings

**Electrical Connection Chart**

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

**UL US**

Length	1/2" NPT, 3/4" NPT, 1" NPT, 1 1/4" NPT, 7/8- SAE 10, 1-1/16-12 SAE 12	G1/2", G 3/4", G1", M20X1.5
L0	9.8"	250 mm
	14.6"	370 mm
	16.1"	410 mm

Process Connection	Dead band	
	To (Top)	Tu (Bottom)
G1/2"	1.06 ± 0.12 [27 ± 3]	1.06 ± 0.12 [27 ± 3]
G3/4"	1.14 ± 0.12 [29 ± 3]	
G1"	1.22 ± 0.12 [31 ± 3]	
M20 x 1.5 mm	1.06 ± 0.12 [27 ± 3]	
1/2" NPT	0.51 ± 0.12 [13 ± 3]	
3/4" NPT		
1" NPT		
1 1/4" NPT		
7/8-14 UNF (SAE 10)	1.01 ± 0.12 [25.7 ± 3]	
1 1/16-12 UN (SAE 12)	1.1 ± 0.12 [28 ± 3]	

**Process Connections\***

\* Non NPT fittings are shown without seals

**Dimensions inches [mm]**

## Product Configurator

Example **BLS3 1 6 X M 14.6Z**

### Series:

BLS3 Series BLS3000, electronic dual level switch

### Output:

1	Dual switch point
2	Single switch point plus 4-20mA
3	Single switch point plus 0-10V
4	Dual switch point plus 4-20mA
5	Dual switch point plus 0-10V
6	Dual switch point ( 1x NO SPST / 1x NC SPST), non UL

### Process Connections:

2	G1/2" male, with seal (seal code V, E or B)
3	1/2" NPT male, without seal (seal code X)
5	G3/4" male, with seal (seal code V, E or B)
6	3/4" NPT male, without seal (seal code X)
A	G1" male, with seal (seal code V, E or B)
B	1" NPT male, without seal (seal code X)
C	1 1/4" NPT male, without seal (seal code X)
H	M20 x 1.5 mm male, with seal (seal code V, E or B)
I'	7/8-14 UNF (SAE 10) male, (seal code V, E or B)
J'	1 1/16-12 UN (SAE 12) male, (seal code V, E or B)

### Seal Material:

X	No seal is required for NPT thread
V	FKM (fluoroelastomer)
E	EPDM (EPR)
B	NBR (BUNA-N)

### Total Sensor Length L0<sup>3</sup>:

0250M <sup>4</sup>	250 mm (process con. code 2, 5, A & H)
0370M <sup>4</sup>	370 mm (process con. code 2, 5, A & H)
0410M <sup>4</sup>	410 mm (process con. code 2, 5, A & H)
1000M <sup>4</sup>	1000 mm (process con. code 2, 5, A and H)
09.8Z <sup>5</sup>	9.8 inch (process con. code 3, 6, B, C, I, & J)
14.6Z <sup>5</sup>	14.6 inch (process con. code 3, 6, B, C, I, & J)
16.1Z <sup>5</sup>	16.1 inch (process con. code 3, 6, B, C, I, & J)
39.4Z <sup>5</sup>	39.4 inch (process con. code 3, 6, B and C)

### Electrical Connection:

M<sup>2</sup> M12 x 1 mm (4 or 5 pin)

## Accessories

Order Number	Description
239535-1M-R-S <sup>6</sup>	4 Pin M12 Female Right Angle Plug Molded Cable, 3.28 Feet (1 Meter), Shielded
239535-1M-S <sup>6</sup>	4 Pin M12 Female Straight Plug Molded Cable, 3.28 Feet (1 Meter), Shielded
239537	4 Pin M12 Female Straight Connector
239236	4 Pin M12 Female Right Angle Connector
239546-1M-R-S <sup>6</sup>	5 Pin M12 Female Right Angle Molded Cable, 3.28 Feet (1 Meter), Shielded
239546-1M-S <sup>6</sup>	5 Pin M12, Female Straight Plug Molded Cable, 3.28 Feet (1 Meter), Shielded
239548-S	5 Pin M12 Female Straight Connector
239548-R	5 Pin M12 Female Right Angle Connector

Note: 1. Subject to minimum order quantity of 10 pieces; consult factory for lead time.  
 2. Mating connector not included with unit; mating connectors are available and can be ordered as an accessory.  
 3. Custom length available up to 39.4" (1000 mm); minimum quantities may apply.  
 4. Available only for G & M thread.  
 5. Available only for NPT, UNF & UN thread.  
 6. See Cable Connectors & Accessories for more options.