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*

Sensor element:	Reed switch
Materials: 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
Operating elements:	3 easy-response push-buttons
Enclosure rating:	Type 1 / Type 4X (IP65) / Type 6 (IP67)
Protection class:	III
Electrical connection:	Plug M12 x 1, 4-pin / 5-pin / 8-pin (depending on Output selection)
Process connection:	See Product Configurator for process connection options (page 2)
Float BN17: Density medium: Depth of immersion:	 min. 0.02 lb/in³ (0.60 g/cm³) 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)
Dimensions enclosure:	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.
Weight:	Approx. 0.77 lb (350 g) (for G1/2” size and 250 mm L0, for exact weight, contact factory)
Total lenght (L0):	9.8" (250 mm), 14.6" (370 mm), 16.1" (410 mm), others on request up to 39.4” (1000 mm)
Accuracy:	± 1 digit (without turbulence) including temperature influence and repeatability
Resolution:	1/5" (5 mm)
Max. pressure:	43.5 psi (3 bar)
Temperature range: 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)
Power supply:	15 to 28 V DC, reversed polarity protected (SELV, PELV)
Power consumption:	Approx. 50 mA (without load) Approx. 80 mA (Output Code 6)

Digital display:	4-digit 14-segment LED display, red, digit height 0.35 inches (9 mm)	
Error display:	LED RED and alphanumeric display	
Analog output: Current output: Load: Scanning rate: Voltage output: Rating: Adjustment range:	 4-20 mA max. Rl = (Ub-12V) / 20 mA Rl = 600 Ohm at Ub = 24 V DC 2 ms 0 to 10 V DC max. 10 mA 25% to 100% f. s.	
Units: Distance: Volume:	 %, mm, cm, m, inch, feet, liter, m³, gallon	
Transistor switchting outputs:		
Switching function:	Normally open/normally closed, standard / window mode and adjustable functions	
Switching output:	PNP	
Adjustment range for switching point and hysteresis:	0 % to 125 % f. s.	
Switching frequency:	Max. 100 Hz	
Load	Max. 500 mA, short-circuit proof	
Delay	0.0 s to 50 s adjustable	
Status display(s):	LED(s) red	
EMI:	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]	

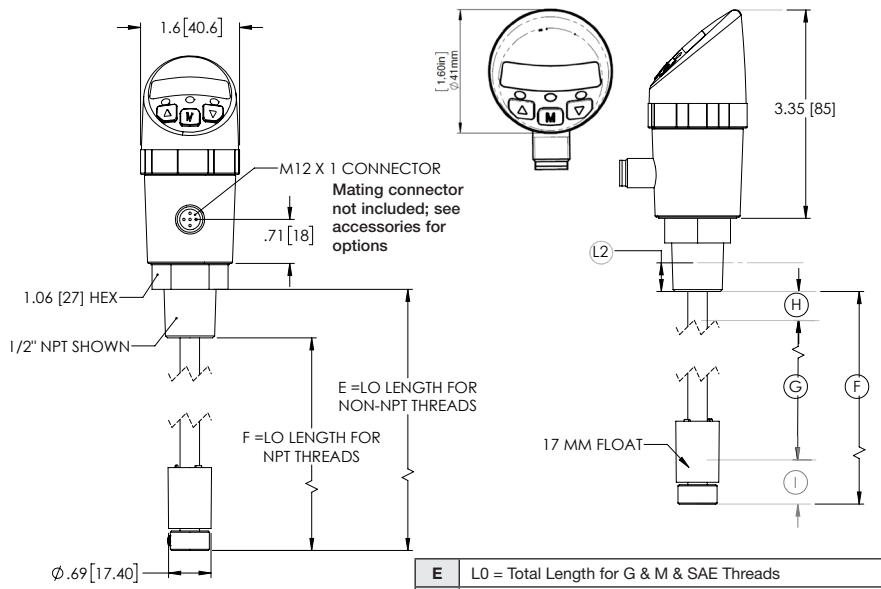
1) Conditions of use: 140 °F (60 °C) max. ambient, power supply max. 28 V DC

* See product configurator for additional options.

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Technical Drawings



E	L0 = Total Length for G & M & SAE Threads
F	L0 = Total Length for NPT Threads
G	LM = L0 - (To + Tu)
H	To = Top Dead Band
I	Tu = Bottom Dead Band
L2	The effective length of 1/2" NPT, 3/4" NPT, 1"NPT and 1-1/4" NPT thread

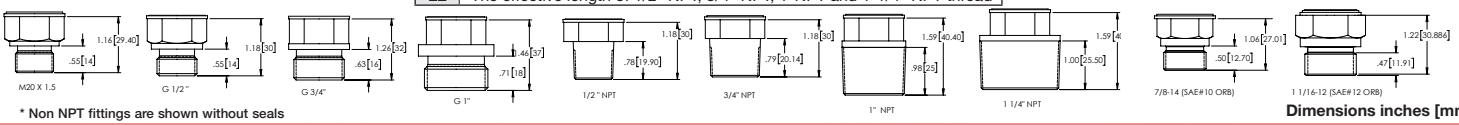
Electrical Connection Chart

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

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)	Dead band Tu (Buttom)
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		
1¼" NPT		
7/8-14 UNF (SAE 10)	1.01 ± 0.12 [25.7 ± 3]	
1 1/16-2 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	1¼" NPT male, without seal (seal code X)
H	M20 x 1.5 mm male, with seal (seal code V, E or B)
I[1]	7/8-14 UNF (SAE 10) male, (seal code V, E or B)
J[1]	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[3]:

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

Electrical Connection:

M[2]	M12 x 1 mm (4 or 5 pin)

Accessories

Order Number	Description
239535-1M-R-S[6]	4 Pin M12 Female Right Angle Plug Molded Cable, 3.28 Feet (1 Meter), Shielded
239535-1M-S[6]	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[6]	5 Pin M12 Female Right Angle Molded Cable, 3.28 Feet (1 Meter), Shielded
239546-1M-S[6]	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.

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