



LEVEL SWITCH & TRANSDUCER



주식회사 플루마

Fluma Co., Ltd.

HYDRAULIC, PNEUMATIC AND ELECTRIC TECHNOLOGY

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
- ▶ Analogue 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 / 8-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
Accuracy	± 1 digit (without turbulence) including temperature influence and repeatability
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) approx. 80 mA (Output Code 6)

Relay output:	Rel. 1 normally closed, Rel. 2 normally open Load: max. 1A, max. 60V, max. 30 W	
Analog output:	4...20 mA	
Current output:	max. RI = (Ub-12V) / 20 mA	
Load:	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 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
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 max. 28 V DC

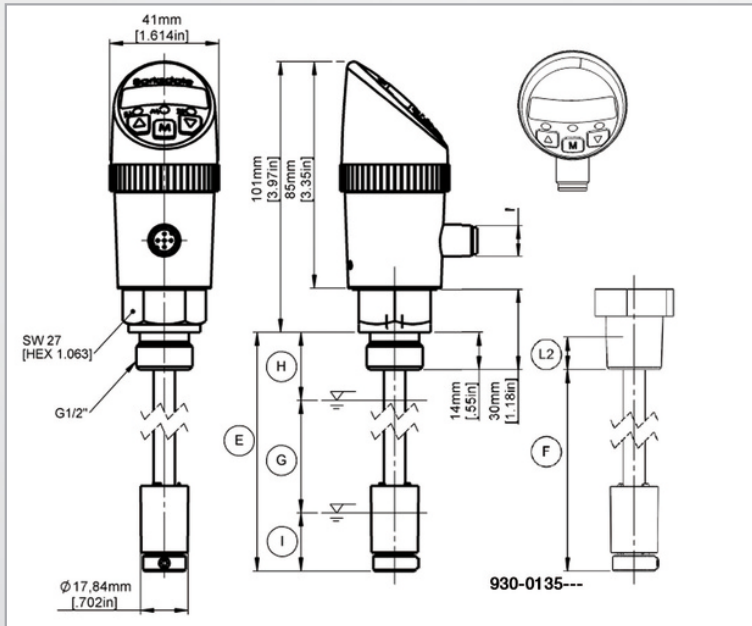
Electr. Dual Level Switch

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, 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)

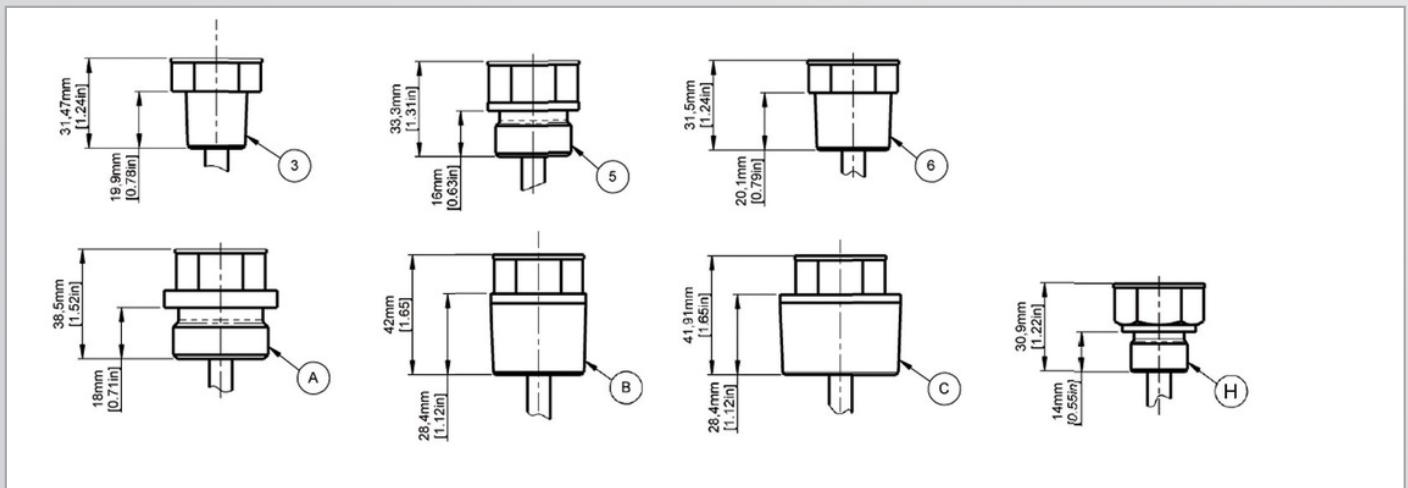


Fitting	Dead band	
	To (top)	Tu (bottom)
G1/2"	27 ±3 [1.06 ±0.12]	27 ±3 [1.06 ±0.12]
G3/4"	29 ±3 [1.14 ±0.12]	
G1"	31 ±3 [1.22 ±0.12]	
M20x1,5 mm	27 ±3 [1.06 ±0.12]	
1/2"NPT	13 ±3 [0.51 ±0.12]	
3/4"NPT		
1"NPT		
1 1/4"NPT		

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

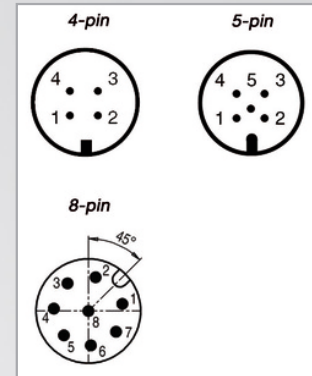
Process connection



Electrical Connection

Pin	Signal Order Code 1	Signal Order Code 2, 3	Signal Order Code 4, 5	Signal Order Code 6	
1	+Ub	+Ub	+Ub	+Ub	
2	SP2	Signal	Signal	SP1a	NC
3	OV	0V	0V	SP1b	
4	SP1	SP1	SP1	0V	
5	-	-	SP2	SP2a	NO
6	-	-	-	SP2b	
7	-	-	-	-	
8	-	-	-	Housing	

Plug



Order Code

BLS3000

BLS3

Base Model

Output

1	2 switch points
2	4...20 mA and 1 switch points
3	0...10 V DC and 1 switch points
4	4...20 mA and 2 switch points
5	0...10 V DC and 2 switch points
6	2 relais switch points (1x NO SPST/1x NC SPST), no UL

Process Connection

2	G1/2" male, with sealing (sealing code V, E or B)
3	1/2"NPT male, without sealing (sealing code X)
5	G3/4" male, with sealing (sealing code V, E or B)
6	3/4"NPT male, without sealing (sealing code X)
A	G1" male, with sealing (sealing code V, E or B)
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)

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 and 8 pin)
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Total Length L0

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

BLS3 1 2 B M 0 3 7 0 M

Special design on request

Features

- ▶ Easy replacement for sight glasses
- ▶ Small diameter ideal for use in tight spaces
- ▶ Rugged construction for long life and maintenance free use
- ▶ Customized to meet your exact specifications

Applications

- ▶ Lube oil console systems
- ▶ Hot water/condensate steam systems
- ▶ Industrial refrigeration
- ▶ Storage tanks
- ▶ Solvent recovery systems
- ▶ Marine applications
- ▶ Industrial refrigeration
- ▶ Scrubbers
- ▶ Semi-conductor industry



General Specifications*

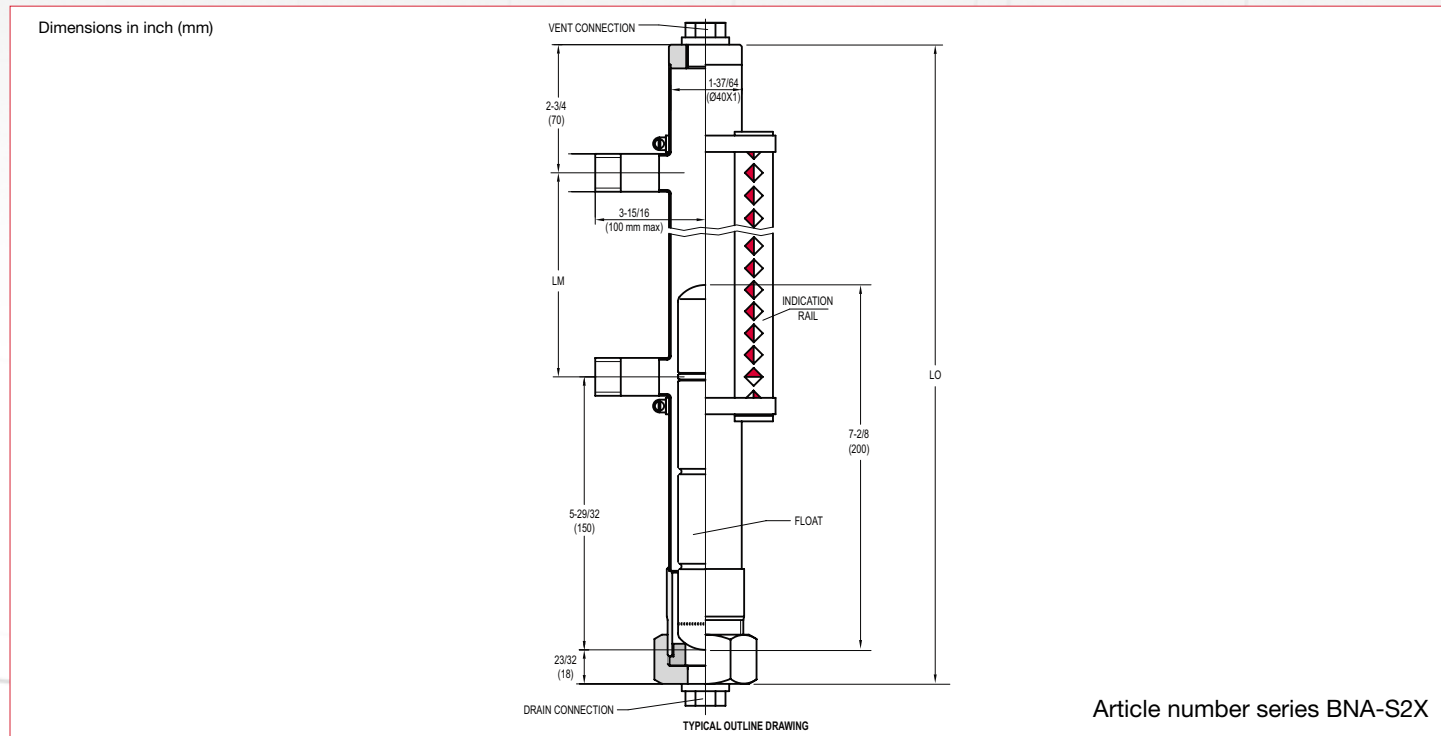
Ranges:	Standard polycarbonate flag assembly to 302°F (150°C)
Temperature:	
Pressure:	Vacuum to 240 psig (16 bar) @ 100°F (38°C)
Proof Pressure:	1.5 x operating pressure
Accessories:	<ul style="list-style-type: none"> - Limit switches - Measuring scale - Remote continuous tank level indicating system - ANSI flange fittings - ABS approval for shipboard services
Maximum Length:	<ul style="list-style-type: none"> - 10 feet - continuous (3000 mm) - 20 feet - maximum
Inner Float Housing Diameter:	1-1/2" (40 mm)
Viscosity:	< 2500 cP
Float Housing Material:	316 Series stainless steel Titanium and BUNA available ¹

Process Connection Size:	See configurator
Operating Pressure Max.:	240 psi (16 bar)
Operating Temperature Max.:	302°F (150°C)
Rotating Flag Assembly:	Polycarbonate 302°F (150°C)
Flag Colors:	White/Red
Float Size:	1.25" dia. x 5.9" (32 x 150 mm) (std)
Float Material:	316 stainless steel (std)
Min. Specific Gravity of Liquid:	0.85 g/cm ³ stainless steel and titanium 0.62 Lg/cm ³ for BUNA
Internal O-Ring:	Teflon®
Vent & Drain Plugs:	1/2" NPT (standard)
Mounting Brackets:	Every 3 feet (standard)

* See product configurator for additional options.

¹ Titanium float recommended for temperatures greater than 302°F.

Technical Drawing



Order Number Key / Options

Example	LMSSM	F01	GP	28.00	L	
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Base Configuration

LMTBM	Top/bottom process connections
LMTSM	Top/side process connections
LMSSM	Side/side process connections
LMSBM	Side/bottom process connections

Process Connection

N01	1/2" NPT male
N02	3/4" NPT male
N03	1 NPT male (for LMSSM models only)
N06	1/2" NPT female
N07	3/4" NPT female
F01	ANSI Class 150 1/2" raise face flange
F02	ANSI Class 150 3/4" raise face flange
F03	ANSI Class 1" raise face flange

Metric connections available upon request

Options

-T	Optional 4-20 mA level transmitter (round up to nearest inch)
-SK	Calibrated self-adhesive scale in Cm (Scotch 467 MP Hi)

Limit switches available - separate line item.

Flag Assembly

L	Polycarbonate flag assembly 302°F (150°C)
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Float Type

GP	Stainless steel float (specific gravity = 0.85 or higher). Temp: 302°F (150°C). Pressure: 240 psi (16 bar)
GT	Titanium float (specific gravity = 0.85). Temp: 305°F (150°C). Pressure: 375 psi (25 bar)
GQ	Buna float (specific gravity = 0.65 min). Temp: 212°F (100°C). Pressure: 150 psi (10 bar)

Length

LL.LL	Measuring length in inches
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* Min. quantity may apply for select configurations.

Multi Level Switch

UNS-1000 Series

Formerly Series BLS 700

Features

- ▶ Fully customizable
- ▶ Up to 5 independent switch points
- ▶ Reversible switch logic
- ▶ Suitable for high viscosity liquids
- ▶ Optional integral temperature switch
- ▶ Hermetically sealed reed switches

Applications

- ▶ Sump tanks
- ▶ Hydraulic power units
- ▶ Storage tanks
- ▶ Solvent recovery systems
- ▶ Lube oil console systems
- ▶ Marine applications



General Specifications*

Max. Operating Pressure:	220 psig (15 bar), NBR (BUNA), and SS float
Minimum Specific Gravity:	NBR (BUNA) - .57 g/cm ³ SS - .71 g/cm ³
Mounting Position:	Vertical, ±30°, through top or bottom
Protection Class:	IP65 for ST-, KL- and PG-design IP67, IP68 on request IP54 for K-design

* See Product Configurator for additional options.

Operating Temperature:	+14 °F to +221 °F (-10 °C to +105 °C), PVC-cable
Special Design Options: (On Request)	DR - Damping tube HT - High temperature silicone-cable -40 °F to +302 °F (-40 °C to +150 °C) U - Mounting location through bottom PT100 - Pt100-element VV - Vertical adjustment Exi - ATEX approval EEx ia
Contact Mode:	NO or NC are defined on the basis of an empty tank and for installation through the top.
Weight:	Dependent on length and design

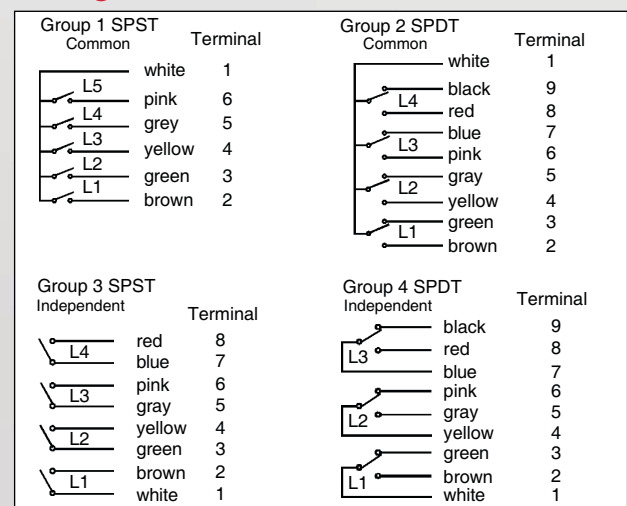
Max. Switchpoints

	KL6C AL Terminal Box	KL12C AL Terminal Box	ST1 DIN Connector	ST2 DIN Connector	PG Cable gland
Connect Group 1	5	5	2	5	3
Connect Group 2	2	4	1	2	1
Connect Group 3	3	4	1	3	2
Connect Group 4	2	3	1	2	1

Combinations

Material	Mounting	Electrical Connection	Float
Stainless Steel (VA)	T1 NPT FLA3	DIN Connector (ST1 & ST2) Terminal box (KL6C or KL12C) Cable gland (PG) PVC Cable (K)	316 Stainless Steel (VA27)
	1/8 NPT 1/2 NPT	Cable gland (PG) PVC Cable (K)	
Brass (MS)	T1 NPT	DIN Connector (ST1 & ST2) Terminal box (KL6C or KL12C) Cable gland (PG) PVC Cable (K)	NBR BUNA-N (BN25)
	1/8 NPT 1/2 NPT	Cable gland (PG) PVC Cable (K)	

Wiring Color / Code



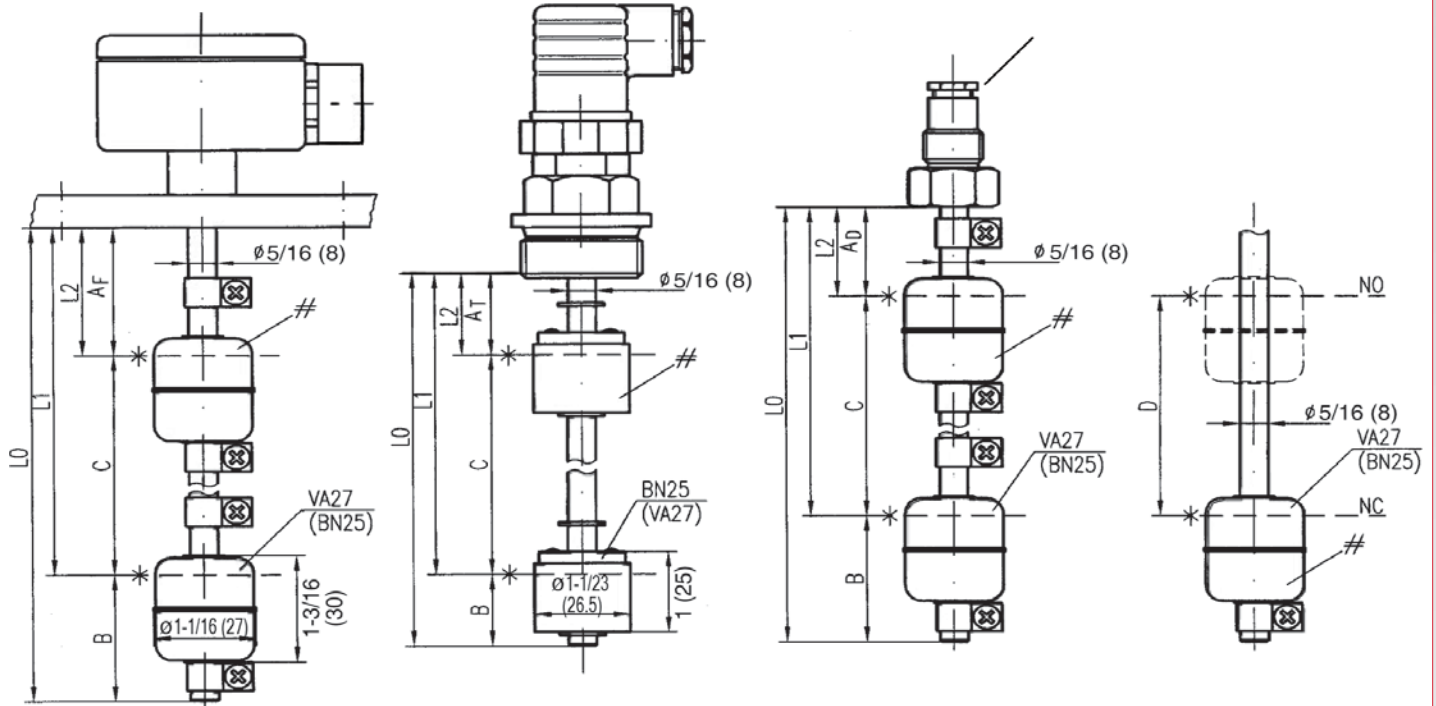
Multi Level Switch

UNS-1000 Series

Technical Drawing

Formerly Series BLS 700

Dimensions in inch (mm)



With Aluminum Junction Box and 1/2" NPT Female Conduit (KL6C or KL12C)

With DIN Connector (ST1)

With Cable gland (PG)

Dual switching (1 float for 2 switchpoints)

1. Length tolerance $\pm 1/8"$ (± 3 mm)
2. L0 = max. 40 in. (1000 mm)

* Immersion depth at density 1:

VA27 = 13/16 in ± 0.1 in (21 ± 2 mm)

BN25 = 1/2 in ± 0.1 in (13 ± 2 mm)

Temperature sensor PT100=dimension B+10mm

Float position:

VA27 = NO/NC \Rightarrow see float marking

SPDT \Rightarrow NO-function

BN25 = NO \Rightarrow compound points at bottom

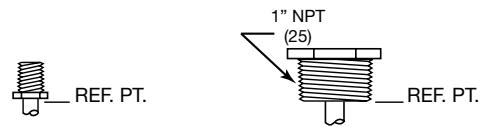
NC \Rightarrow compound points at top

SPDT \Rightarrow compound points at bottom

Dimensions	Min. distances in inch/mm					
	A _F	A _T	A _D	B	C	D
Float type						
VA27	1/26	1/26	1/26	1.6/40	2.56/65	1.25/32
BN25	.86/22	.86/22	.86/22	1/25	1.78/45	1.25/32

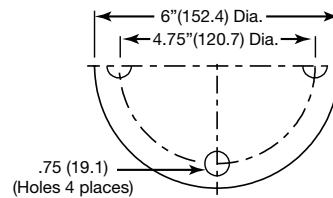
(When using -DR: Dimension B + 3/4" (20 mm)!) on request

Mounting Types:



1/8" or 1/2" NPT Male

T1" NPT



FLA3

2" 150# Flange
Flange DJN2527
DN50/PN16

Barksdale[®]
CONTROL PRODUCTS

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

Multi Level Switch

UNS-1000 Series

Formerly Series BLS 700

UNS-1000 Series Order Form

Check Boxes to Select Specification Requirements

Description:

UNS 1000 - _____ / _____ - _____ - _____ - _____ / _____ - _____

Special P/N to be assigned once order is received: L700XXX

Product Configurator

Example	UNS 1000	-VA	/ T1NPT	-KL6C	-VA27	-L2	/ 2.1	-U-HT-(DR)(-VV)-PT100-Exi
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Basic Configuration

UNS-1000 Series Level switch type

Check Required Specs

Material of Stem

<input type="checkbox"/>	VA	316 SS
<input type="checkbox"/>	MS	Brass

Mounting Element

<input type="checkbox"/>	1/8NPT	1/8" NPT, mounting thread (inside tap)
<input type="checkbox"/>	1/4NPT	1/4" NPT, mounting thread (inside tap)
<input type="checkbox"/>	1/2NPT	1/2" NPT, mounting thread (inside tap)
<input type="checkbox"/>	T1NPT	1" NPT tank screw
<input type="checkbox"/>	FLA3	Blind flange, 2" 150 lbs RF (ANSI) (VA only)

Electrical Connection¹

<input type="checkbox"/>	ST1	Cube plug DIN 43650, 3-pin + earth
<input type="checkbox"/>	ST2	Angle plug DIN 43651, 6-pin + earth
<input type="checkbox"/>	KL6C	Aluminum terminal box, 6 terminals w/ 1/2" NPT conduit
<input type="checkbox"/>	KL12C	Aluminum terminal box, 9 terminals w/ 1/2" NPT conduit
<input type="checkbox"/>	PG	PG-cable gland with 1 m PVC-cable (22 AWG)
<input type="checkbox"/>	K	PVC-cable sealed std 1 meter (22 AWG)
<input type="checkbox"/>	KXP	Explosion proof junction box with 1/2" conduit female. (Only available with 1" NPT option)
<input type="checkbox"/>	C	1/2" NPT male conduit (VA only)

¹ See "Combinations" section on page 1 for mounting and electrical connection options.

No. of Switchpoints***

<input type="checkbox"/>	L1	1 Switchpoint @ _____ in / mm
<input type="checkbox"/>	L2	2 Switchpoints @ _____ in / mm
<input type="checkbox"/>	L3	3 Switchpoints @ _____ in / mm
<input type="checkbox"/>	L4	4 Switchpoints @ _____ in / mm
<input type="checkbox"/>	L5	5 Switchpoints @ _____ in / mm

Float Type

	Min. Density	Material	Form	Dia. (Ø)	Max. Temp.	Pressure (+20 °C)
<input type="checkbox"/>	BN25	0.57 g/cm ³	BUNA NBR	Cylinder 1" / 25 mm	212 °F (100 °C)	15 bar
<input type="checkbox"/>	VA27	0.71 g/cm ³	Stainless steel, 316	Cylinder 1-1/16" / 27 mm	302 °F (150 °C)	15 bar

Contact Type of Float(s)

	Contact Mode	Contact Rating
<input type="checkbox"/>	1-SPST (NO)	230 V AC / DC, 2 A, 40 VA / W
<input type="checkbox"/>	2-SPST (NC)	230 V AC / DC, 2 A, 40 VA / W
<input type="checkbox"/>	3-SPDT	150 V AC / 100 V DC, 0.2 A, 3 VA / W

Options

Please specify when needed

<input type="checkbox"/>	DR	Damping tube
<input type="checkbox"/>	HT	High temperature silicone-cable (-40 °F to +302 °F (-40 °C to +150 °C))
<input type="checkbox"/>	U	Mounting through bottom
<input type="checkbox"/>	PT100	Pt100-element
<input type="checkbox"/>	VV	Vertical adjustment
<input type="checkbox"/>	Exi	ATEX approval EEx ia (Enclosure)
<input type="checkbox"/>	TS/xx/2	Temperature Sensor, xx = °C: +60 °C, +70 °C, +80 °C, +90 °C, /2=NC

IMPORTANT

Must specify with your orders

1 - Overall stem length: L0= _____ in/mm max. 40" (1000 mm)

2 - Dimensional position of float***

3 - Pick wiring code:

Group 1		Group 2		Group 3		Group 4	
SPST Common	Terminal	SPDT Common	Terminal	SPST Independent	Terminal	SPDT Independent	Terminal
	white 1		white 1		red 8		black 9
	pink 6		black 9		blue 7		red 8
	grey 5		red 8		pink 6		blue 7
	blue 7		blue 7		grey 5		pink 6
	yellow 4		pink 6		yellow 4		grey 5
	green 3		grey 5		green 3		yellow 4
	brown 2		yellow 4		brown 2		green 3
			green 3		white 1		brown 2
			brown 2				white 1

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