Switch to Generation 3000

Variety that inspires

One Series for

- Pressure
- Temperature
- Level

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Techniquip

Barksdale®
CONTROL PRODUCTS

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

To set the benchmark
BPS3000 / BTS3000 / BLS3000
One Series for Pressure, Temperature, Level

Variety that inspires

Based on one system platform the switch offers a wide range of applications; the **BPS3000** operates from 0 ...0.2 bar to 0 ... 600 bar, the **BTS3000** operates from 0 ...100 °C to -30 ... 140 °C while the **BLS3000** offers total lengths (L0) from 250 ... 1000 mm.

Compact and modern design

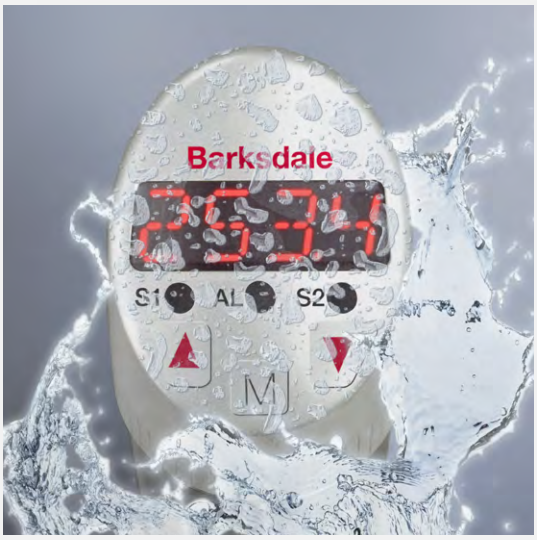
The Series is characterised with panel height of 110 mm and diameter of nealry 41 mm which enables compact installation of many switches. Its angled top design is aesthetically pleasing and a real functional highlight.

Rotatable 320° display and electrical connection

It´s as simple as that: due to rotatable 320° display and electrical connection, the mounting and installation will be a walk in the park. To turn into the required position and that's it.

Perfect readability

The 4-digit 14-segment LED display ensures a perfect readability independent of the positioning: even in case of mounting upside down the indication can be viewed correctly as the software allows inversion of the display.



High protection with IP65/IP67 and EMI protection

Harsh environmental circumstances, with dust or water being present are not a problem for the Generation 3000. Continued functionality will be achieved by a sophisticated housing seal and a keypad integrated within the plastic housing. The high EMI protection of the Generation 3000 allows installation in environments where high power walkie-talkies are in use e.g. in the steel and power industries.

Easy operation

Menu and electrical connection refer to VDMA standard 24574-1, this guarantees an easy and quick operation.

The **Generation 3000** combines all features of a modern switch series. With its **flexibility**, its operational convenience, its **compact** and **elegant industrial design**, being the result of long experience and intensive market analysis. There are hardly any limits to pressure, temperature, level monitoring or applications the Generation 3000 is not able to address.

BPS3000

- Measuring ranges: 0 … 0.2 bar to 0 … 600 bar
- Ceramic or piezoresistive sensor
- Analogue output: 4 … 20 mA or 0 … 10 V DC

PRESSURE

Electr. Dual Pressure Switch

BPS3000

Features

- Measuring ranges: 0...0.2 bar to 0...600 bar gauge
- 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

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

Technical Data

Sensor element:	Ceramic sensor optional: piezoresistive sensor
Materials: Wetted parts: Electronics housing: Seals:	 Stainless steel, mat. no. 1.4301, brass MS58* Stainless steel, mat. no. V2A, PA / PC 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. 300 g
A/D converter: Resolution: Scanning rate:	 12 bit (4096 steps per measuring span) 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: Electronics: Storage:	 -25 °C... +100 °C -10 °C... +70 °C [1)] -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) approx. 80 mA (Output Code 6)

Relay output:	Rel. 1 normally closed, Rel. 2 normally open Load: max. 1A, max 60 V, max. 30 W	
Analog output: 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...10 V DC max. 10 mA 25 %... 100 % f. s.	
Transistor switchting 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) - E42816	

* In the pressure inlet a damping screw made of brass is mounted. This screw can be removed of 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

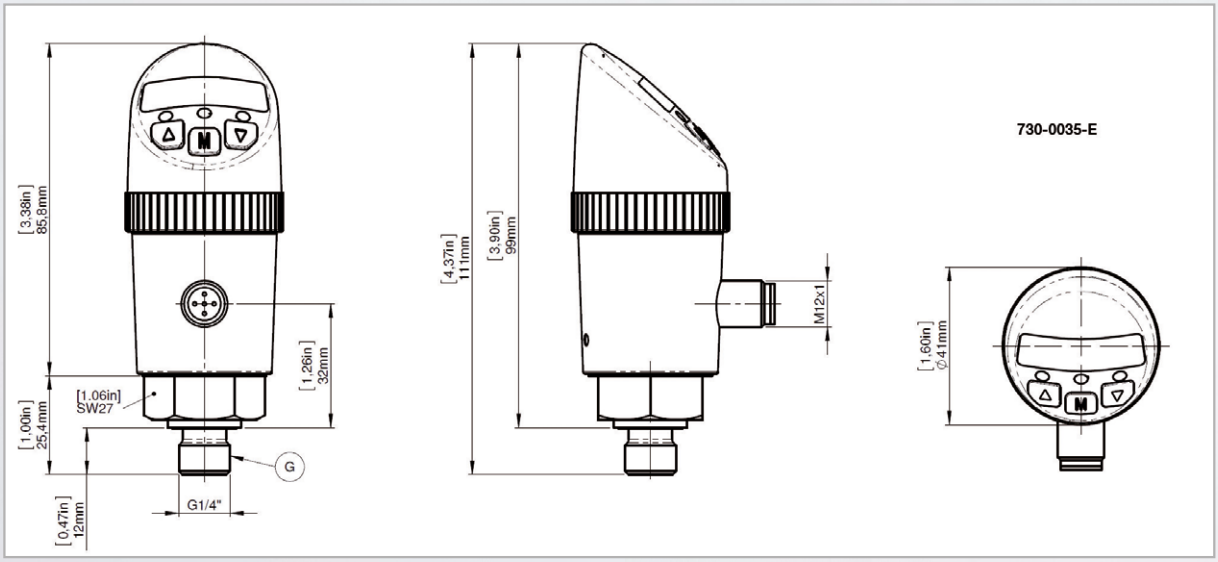
Electr. Dual Pressure Switch

BPS3000

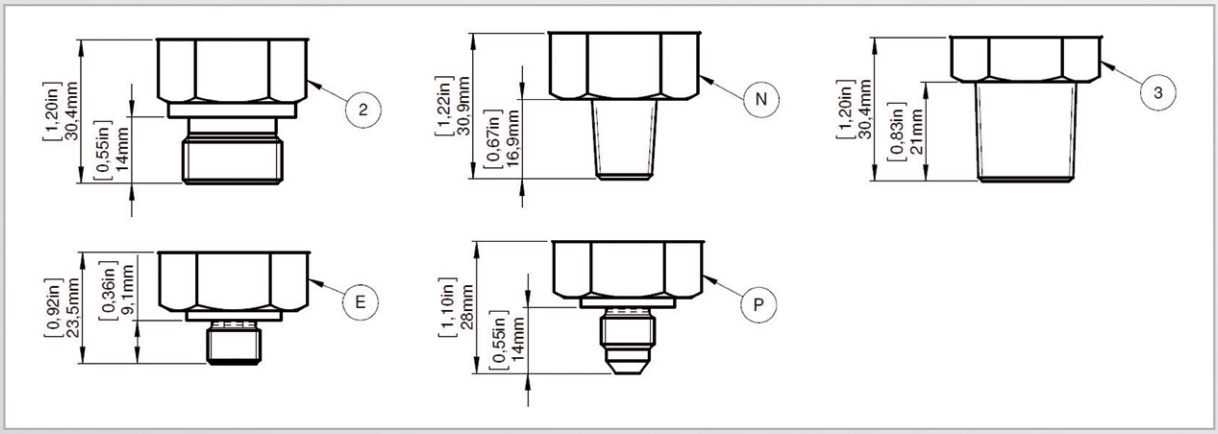
Accessories

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*)



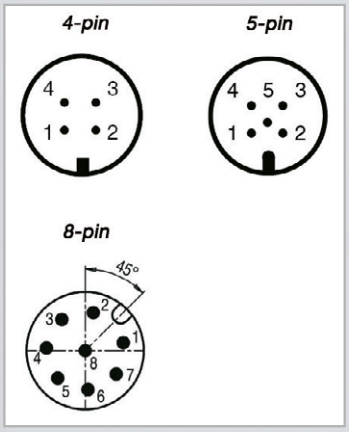
Process connection



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	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	NO
6	-	-	-	SP2b	
7	-	-	-	-	
8	-	-	-	Housing	

Order Code

BPS3000									
BPS3									Base Model
	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
	6								2 relais switch points (1 x NO SPST / 1 x NC SPST) (requires piezo. sensor / code P)*, no UL
		Process Connection							
		G							G1/4" ext. threat
		2							G1/2" flush diaphr. (requires piezoresistive sensor / code P* /10-600 bar only)
		N							1/4"NPT ext. threat
		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. threat
		P							7/16-20 UNF(37° JIC) ext. threat
			Sealing						
			V						FKM
			E						EPDM
				Electrical Connection					
				M					M12
					Range				
					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)*
					0 0 . 5 B				0 - 0.5 bar (requires piezoresistive sensor / code P)*
					0 0 0 1 B				0 - 1 bar (requires piezoresistive sensor / code P)*
					0 0 0 2 B				0 - 2 bar (requires piezoresistive sensor / code P)*
					0 0 0 5 B				0 - 5 bar (requires piezoresistive sensor / code P)*
					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

BLS3000

- Resolution: 5 mm
- Direct measurement
- Total length (L0): 250 – 1000 mm

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
- 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): Float: Seals: Electronics housing:	 Stainless steel, mat. no. 1.4571 NBR foam FKM, EPDM or NBR Stainless steel (1.4571), polycarbonate, elastomer
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: Depth of immersion:	 min. 0.60 g/cm³ 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 lenght (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: Ambient: Storage:	 -25 °C... +80 °C -20 °C... +70 °C (1) -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: 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...10 V DC max. 10 mA 25 %... 100 % f. s.	
Units: Distance: Volume:	 %, mm, cm, m, inch, feet, liter, m³, gallon	
Transistor switchting 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

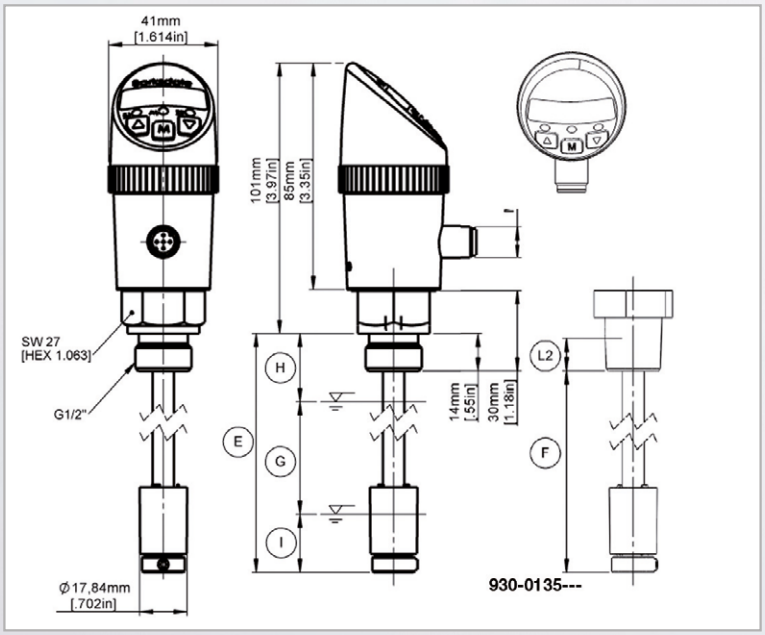
Electr. Dual Level Switch

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*)

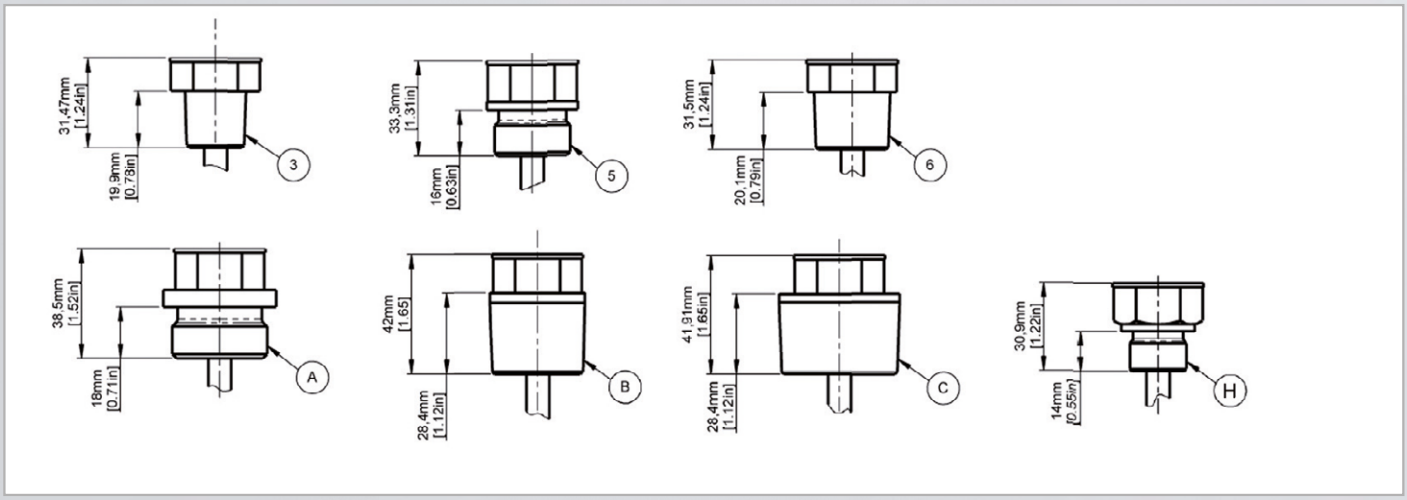


Fitting	Dead band	
	To (top)	Tu (bottom)
G1/2"	27 ±3 [1.06 ±0.12]	27 ±3 [1.06 ±0.12]
G3/4"	29 ±3 [1.14 ±0.12]	
G1"	31 ±3 [1.22 ±0.12]	
M20x1,5 mm	27 ±3 [1.06 ±0.12]	
1/2"NPT	13 ±3 [0.51 ±0.12]	
3/4"NPT		
1"NPT		
1¼"NPT		

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 11/4" NPT thread
G	LM = L0-(To+Tu)
H	To = dead band top
I	Tu = dead band bottom

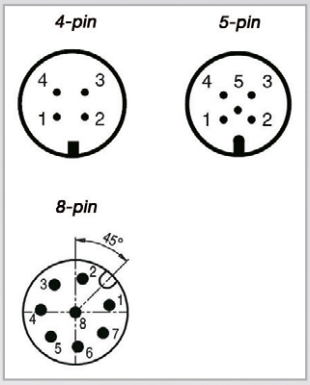
Process connection



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)
					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

BTS3000

- Measuring ranges: 0 … 100 °C to -30 … 140 °C
- Sensor element: Pt100
- Probe length: 17 – 650 mm

TEMPERATURE

Electr. Dual Temperature Switch

BTS3000

Features

- Measuring ranges: 0 ...100 °C to -30 ... 140 °C
- 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

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

Technical Data

Sensor element:	PT100 Class A DIN/IEC 60751
Materials: Wetted parts: Electronics housing: Seals:	 Stainless steel, mat. no. 1.4301 Stainless steel, V2A, PC, PA6.6 GF30 FKM
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
Process connection:	G1/4" M, 1/4" NPT M
Dimensions:	110 x 41 mm (without plug connector and probe)
Weight:	approx. 200 g
Measuring ranges:	0 ...100 °C / 32 ... 210 °F -30 ... 140 °C / -22 ... 280 °F
A/D converter: Resolution: Scanning rate:	 12 bit (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:	200 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) approx. 80 mA (Output Code 6)	
Relay output:	Rel. 1 normally closed, Rel. 2 normally open, Load: max. 1 A, max. 60 W, max. 30 W	
Analog output: 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...10 V DC max. 10 mA 25 %... 100 % f. s.	
Transistor switchting 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 - E302981	

Accessories

Order Number	Description
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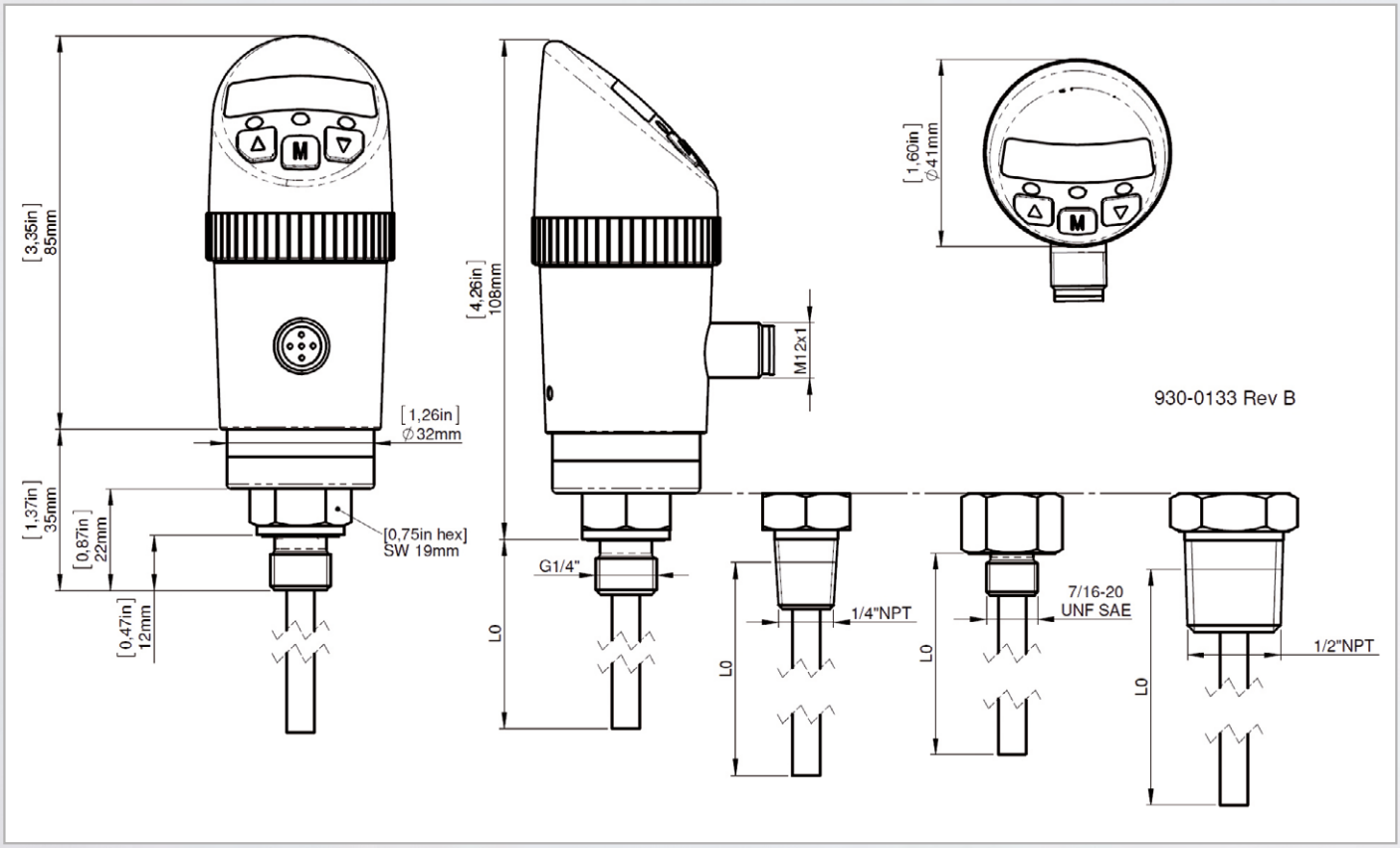
908-0544	Plug connector M12 x 1, 8-pin, with moulded cable (IP67), 2 m length

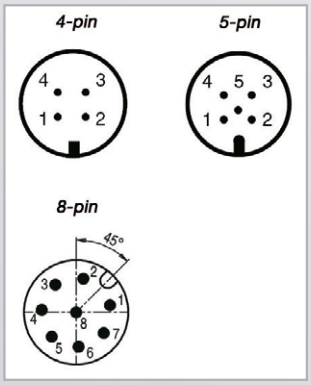
Electr. Dual Temperature Switch

BTS3000

Dimensions (mm / *inch*)



Plug



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	

Order Code

BTS3000											
BTS3											Base Mode
	Output										
	1										2 switch points
	2										4…20mA - 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), no UL
		Process Connection									
		G									G1/4" ext. Threat, (Sealing Code V, E and F)
		2									G1/2" ext. Threat, on request, (Sealing Colde V, E and F)
		N									1/4" NPT ext. Threat (Sealing Code X)
		3									1/2" NPT ext. Threat (Sealing Code X)
		E									7/16...20 UNF ext. Threat (Sealing Code X)
			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	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	

* If probe length >100 mm shock and vibration values can deviate - depending on application.
If probe length >300 mm kepp away the flow from the probe.
If probe length < 25 mm linearity error and time constante values can deviate - depending on application.

Generation 3000
quality by design

The flexibility of the new Series is nearly unlimited – it may used not only to monitor pressure but also to control temperature and level.

BPS3000
Electronic
Pressure Switch

BTS3000
Temperature
sensor Pt100

BLS3000
Float / reed system

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Specifications are subject to change without notice.
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