Sensors & Switches

Sensors & Switches for Wind Turbines

Control

Control every move

- High functional safety to -40°C
- Small hysteresis
- UL approvals

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

First hand competence

The functionality and efficiency of a wind-energy plant depends on the interaction of the components used. This is why the gear mechanism, the pitch-controls and the brakes must be protected from malfunction. In order to ensure this protection high-quality pressure and temperature switches, as well as level probes and sensors are used to monitor the grease and oil conditions. This equipments is build to suite the influences and condition at the installation site.

Barksdale produces these switches and sensors in Germany but is also close to all international customers with its distribution channels in China, the USA and India. For more than 60 years our excellent customer service and our understanding of quality are the basis for our ongoing success.

Through our affiliation with the worldwide operating Crane Company highest production standards are guaranteed from which our customers profit by on time delivery, reliability and quality. The constant improvement of our production processes and our know-how is driven by internal development measurements (like Lean Production, 5-S and Kaizen).

Mechanical Pressure Control

- Rugged construction
- Small hysteresis
- High functional safety to -40°C
- UL approvals

Sensors & Switches for Wind Turbines

Electronic Pressure-, Temperature- and Level Control

- High functional safety to -40°C
- UL approvals

Mechanical Level Control

- High functional safety to -40°C
- UL approvals
- Rugged construction
- High modification level
- Integrated temperature control

Compact Pressure Switch

Type Series 9000

Mechanical pressure switch in piston design with
30 x 30 x 92 mm front face and precise switching point setting

Art. no. 923-1647 Index: D

Features

High-quality materials,
100% functional test,
Compact design,
Long pressure spring (precisely adjustable),
G1/4" female thread, Set screw captive

Adjustment ranges

10...400 bar

Applications

OEM applications,
Mobile and industrial hydraulics,
Test bed and apparatus engineering,
Heavy industry,
Shipbuilding

Technical Data

Wetted parts:	sealing: PTFE/FKM fitting: AlMg4,5Mn piston: steel (100Cr6)
Repeatability:	±2% (typically)
Switching rate:	max. 60/min.
Temperature range: storage: piston switch:	 -40 °C ... +80 °C (-40 °F ... +176 °F) -20 °C ... +80 °C (-4 °F ... +176 °F)
Protection class:	IP65
Material: housing: electrical plug: adjustment screw:	 AlMg4,5Mn Polyamid (PA) Stainless Steel (1.4305)

Process connection:	G1/4" female thread DIN ISO 228-1
Electrical connection:	EN 175301-803-A plug (formerly DIN 43650)
Weight:	175 g (0.39 lbs)
Micro switch:	(SPDT) silver contacts
Approvals: **(in preparation)**	GL, BV, others on request

Pressure ranges

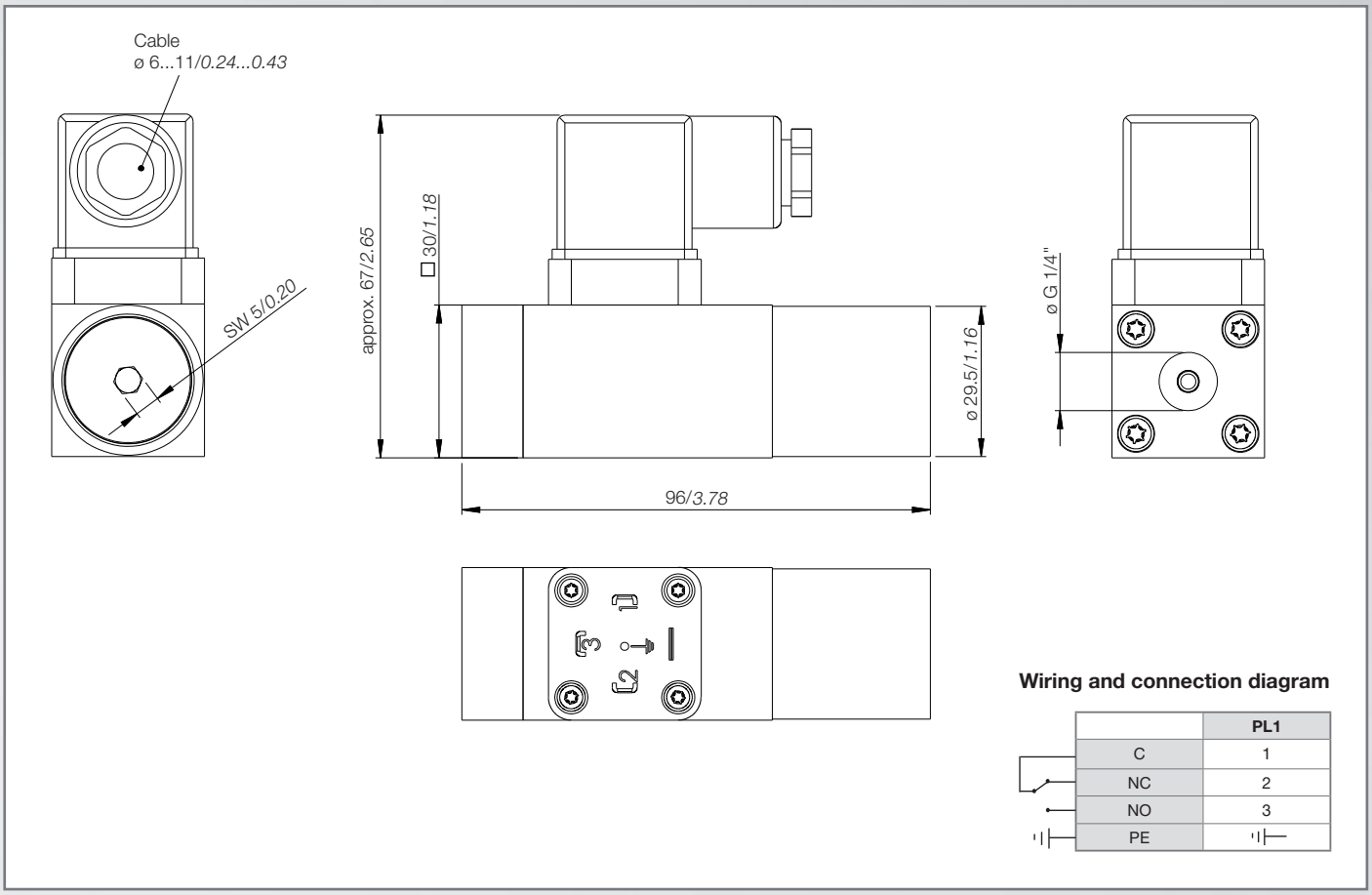
Pressure range code [bar]	Adjustment range		Max. hysteresis at full range max %	Max. operating pressure [bar]	Proof pressure [bar]
	Decreasing press. [bar]	Increasing press. [bar]			
1	6 … 44	10 ... 50	10 %	250	300
2	15 ... 185	20 ... 200		250	300
3	35 ... 360	40 ... 400		500	600

Process connection/Electrical connection/Seal

Process connection	Electrical connection	Seal
(2) G1/4" IG DIN ISO 228-1	**(PL1)** Plug, 4-pin acc. to EN 175301-803-A	**(V)** FKM **(B)** NBR **(E)** EPDM

Art. no. 923-1647 Index: D

Dimensions (in mm/*inch*)



Wiring and connection diagram

	PL1
C	1
NC	2
NO	3
PE	⏚

Electrical ratings

Micro switch	Special features	Volt AC 50/60 Hz	Ind. load A	Res. load A	Volt DC	Ind. load A	Res. load A	Minimum capacitance
1	Silver contacts	250 V~	2.5	10.0	24 V=	1.0	6.0	20 mA at 24 VDC

Approvals

GL	Germanischer Lloyd
BV	Bureau Veritas

Ordering

Example for order number

Type	Process connection	Pressure range	Micro switch Contact		Electrical connection		Seal		Approvals
9	**2**	**2**	**1**	—	**PL1**	—	**V**	—	**GL**

Your order number

9	**2**		**1**	—	**PL1**	—		—	

Compact Pressure Switches

Type Series 8000

Series 8000 - mechanical pressure switches in diaphragm or piston design. The successors of the product lines XTM, XTK, X1T and 96200 have the additional advantage of very low and precise switching point settings.

Art. no. 923-1295 Index: G

Features

Modular construction,
Versatile,
High-quality materials,
100% assays,
Long pressure spring

Adjustment ranges

0.6...600 bar

Applications

OEM applications,
Mobile- and industrial-hydraulics and pneumatics,
Test bed and apparatus engineering,
Heavy industry

Technical Data

Wetted parts:	
standard:	NBR, PTFE with bronze and stainless steel 1.4301; pistons: steel
optional:	FKM, EPDM, CR instead of NBR
Repeatability:	±1% type, piston pressure switch ±2% type, diaphragm pressure switch
Switching rate:	max. 60/min piston pressure switch max. 30/min diaphragm pressure switch
Temperature range:	
Piston switch:	-40 °C ... +80 °C (-40 °F ... +176 °F)
Diaphragm switch:	-20 °C ... +80 °C (-4 °F ... +176 °F)
Protection class:	
standard:	IP65 (plug connector), IP68 (cable) UL
optional:	Inherent safety Ⓔx II 1G Ex ia IIB T6 (DIN plug) - EXI Ex ia IIC T6 (cable version) - EXI Ⓔx II 1GD Ex ia D 20 T100 UL, Type 4, for indoor and outdoor use

Housing:	
standard:	Aluminium diecast 230
optional:	Stainless steel 1.4305/SS 304, Version - VA
Process connection:	CETOP flange □ 40x40 mm, see dimensions
Electrical connection:	see dimensions
Weight:	
Total:	400 g (0.88 lbs)
CETOP flange version:	350 g (0.77 lbs)
Adapter version straight:	620 g (1.36 lbs)
Adapter version 90° offset:	675 g (1.48 lbs)
Adapter version X1T compatible:	730 g (1.61 lbs)
Micro switch:	Change-over contact (SPDT)
Set screw:	Stainless steel 1.4305/SS304 (SW5), captive
Approvals:	GL, Ex ia, cULus, further approvals on request

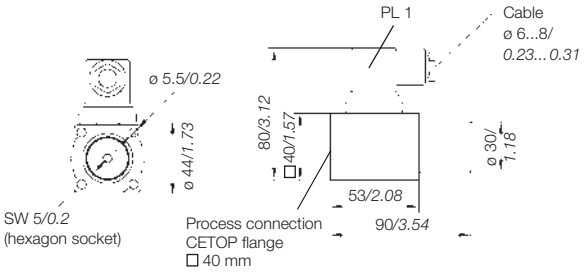
Pressure ranges and proof pressures

Pressure range code		Adjustment range (pressure increasing)		Adjustment range (pressure decreasing)		Max. operating pressure		Proof pressure		Max. hysteresis range end
[bar]	*[psi]*	[bar]	*[psi]*	[bar]	*[psi]*	[bar]	*[psi]*	[bar]	*[psi]*	
		Diaphragm		**Diaphragm**						
1	A	0.6 ... 6.0	*(8.7...87)*	0.4...5.7	*(5.8...82)*	50	*725*	80 *	*(1,200)*	≤15%
2	b	3.0...20.0	*(45.0...250)*	2.0...17.0	*(29...246)*	50	*725*	80 *	*(1,200)*	
3	c	4.0...45.0	*(60.0...650)*	3.0...41.0	*(43...600)*	50	*725*	80 *	*(1,200)*	
		Piston		**Piston**						
4	D	5.0...180	*(75...2,600)*	3.0...160	*(43...2,320)*	250	*3600*	600	*(8,700)*	≤15%
5	E	50.0...350	*(750...5,000)*	30.0...300	*(430...4,300)*	450	*6500*	600	*(8,700)*	
6	F	80.0...600	*(1,200...8,700)*	55.0...520	*(800...7,550)*	600	*8700*	900	*(15,000)*	

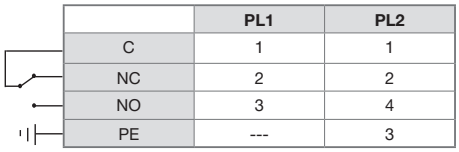
* Test pressure 200 bar *(2,900 psi)* upon request, results in less lifetime of the switch.

Art. no. 923-1295 Index: G

Dimensions (in mm / *inch*)



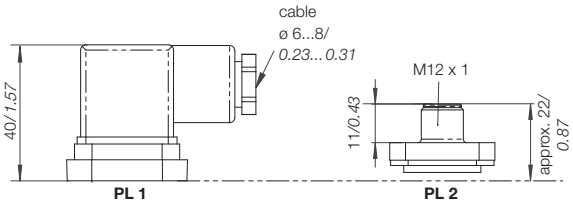
Switching- and connection diagram (pressureless)



	PL1	PL2
C	1	1
NC	2	2
NO	3	4
PE	---	3

Up to pressure stage 5 or E every pressure switch is supplied with two fastening screws M5×60 mm according to DIN 912 (10.9, galvanized).
The pressure switches of pressure stage 6 or F are supplied with four screws.

Electrical connection (PL1 = standard)

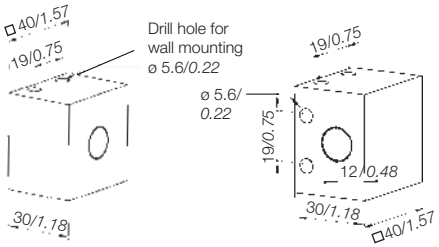


Cube plug DIN EN 175301-803 A (former DIN 43650)

Plug M12x1 mm, 4-pin

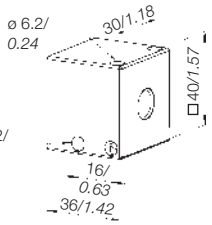
Process connections

Complete assembly with pressure switch only upon request



Connecting block **I**, straight version

Connecting block **II**, version 90° offset (optional, only upon request)



Connecting block **III**, compatible with X1T, 96100/96111 (optional, only upon request)

Electrical ratings

Micro switch	Special features	Volt AC 50/60 Hz	Ind. load A	Res. load A	Volt DC	Ind. load A	Res. load A	Minimum capacitance	Intrinsic safety Ex ia
1	Silver contacts	250 V~ 125 V~	2.0 3.0	3.0 5.0	30 V= 250 V=	3.0 0.2	4.0 0.2	160 mA at 5 VDC	Umax = 28 V Imax = 50 mA
2	Gold contacts*	125 V~	---	0.1	30 V=	---	0.1	0.1 mA at 5 VDC	

* e.g. suitable for PLC and/or Ex ia

Seal

	Seal
B	NBR
N	CR
E	EPDM
V	FKM

Options

	Housing
VA	1.4305

Approvals

EXI	Ex ia
GL	Germanischer Lloyd
UL	cULus approval

Ordering

Example for order number

Type	Process connection	Pressure range	Micro switch Contact		Electrical connection		Seal	Options		Approvals
8	**1**	**2**	**1**	—	**PL1**	—	**B**	**VA**	—	**GL**

Your order number

8	**1**			—		—			—	

Accessories (To be listed separately in case of order. Blocks are slackly arranged.)

Connecting block no.	Order No.	Process connection	Designation	Material
I	906-0953	1/4" NPT female	straight	St passivated
I	906-0954	G 1/4" female	straight	St passivated
I	906-0946	1/4" NPT female	straight	1.4305
I	906-0947	G 1/4" female	straight	1.4305
II	906-0926	G 1/4" female	90° offset	1.4305
II	906-0927	1/4" NPT female	90° offset	1.4305
III	906-0919	G 1/4" female	straight	AlMg4,5Mn0,7

Compact Pressure Switches

Type KLK-.../KLM-...

Piston pressure switch Type KLK
Repeatability ±1.0 % typical

Diaphragm seal pressure switch Type KLM
Repeatability ±2.0 % typical

Index: D

Features

OEM pressure switch series,
Compact design,
Threaded connection
Factory settings only fully tamper proof.

Adjustment ranges

1 ... 400 bar

Applications

Mobile hydraulics,
Motor control,
Hydraulic clamping

Technical Data

Wetted parts: Type KLK: Type KLM:	NBR, PTFE Brass, roller bearing steel Stainless steel
Repeatability: Type KLK: Type KLM:	 ±1 % typical ±2 % typical
Switching rate: Type KLK: Type KLM:	 max. 60/min max. 30/min
Temperature range: Type KLK: Type KLM:	 -40 °C... +80 °C -20 °C... +80 °C
Protection class: Silicone cable (K2): Plug connector (S1):	 IP67 IP65
Housing: Type KLK: Type KLM:	 Brass and stainless steel Stainless steel

Process connection:	M12 x 1.5 G1/4 male other connections on request
Electrical connection:	Silicone cable (K2) Plug connector (S1)
Electrical ratings capacity and hysteresis:	A large variety of micro switches offers different electrical ratings and hysteresis for many applications.
Weight: Type KLK: Type KLM:	 0.2 kg approx. 0.2 kg approx.
Set point adjustment:	Factory set
Intrinsically safe:	A large variety of micro switches offers different electrical ratings and hysteresis for many applications.
Approval:	EXI Ex i approval

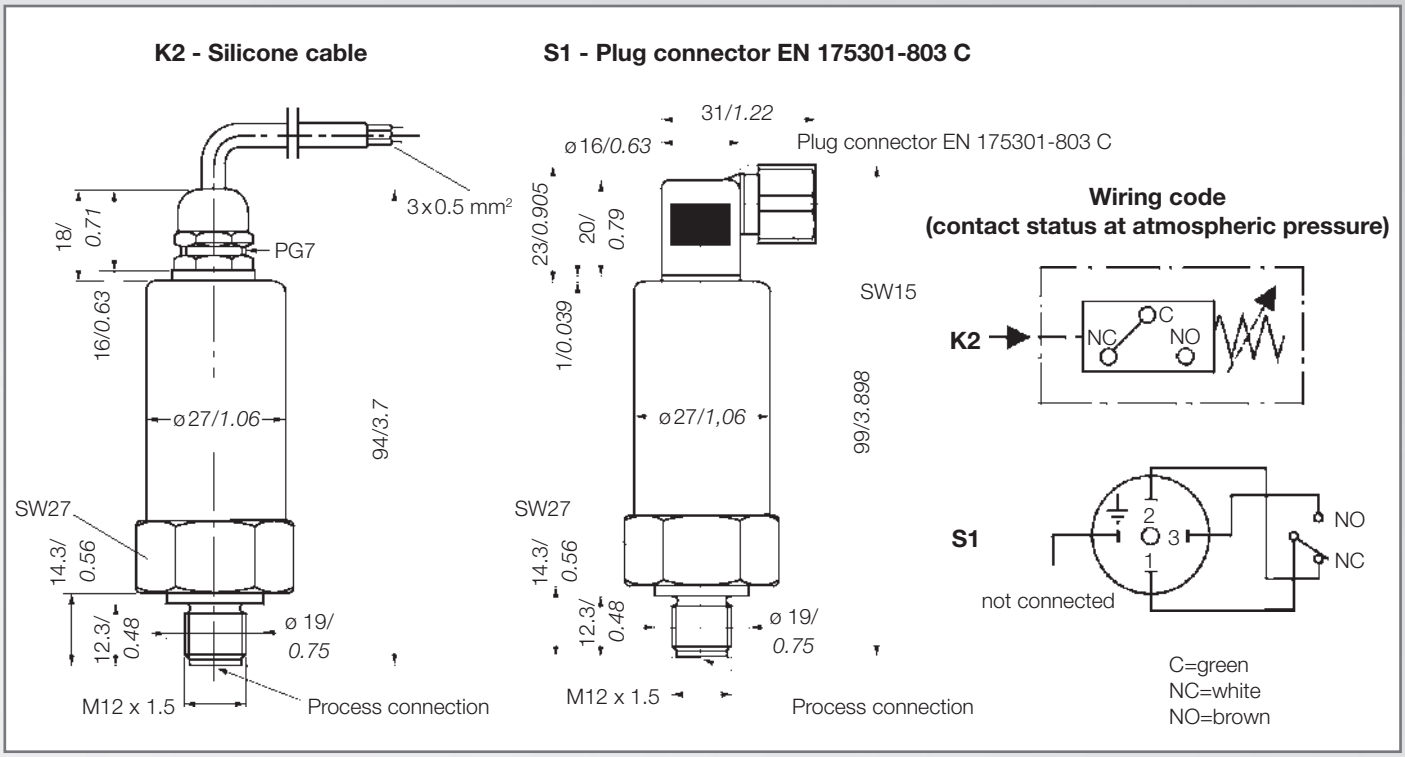
Pressure ranges

* Higher operating pressure (up to 150 bar) (with proof pressure 200 bar) on request. Please add to your order!

Pressure range code	Adjustment range [bar]	Proof pressure [bar]	Max. operating pressure [bar]	Max. hysteresis [bar]
	Increasing pressure	short term		end of range
KLM-006	1 ... 6	80/200*	40*	0.6
KLM-025	5 ... 25	80/200*	40*	2.6
KLM-040	10 ... 40	80/200*	40*	3.8
KLK-100	30 ... 100	450	300	15
KLK-300	60 ... 300	450	300	30
KLK-400	150 ... 400	600	400	60

Dimensions (in mm / *inch*)

Index: D



Electrical ratings

Micro switch	Special features	Volt DC	Ind. load A	Res. load A	Comments
1	Micro switch with silver contacts	30	3.0	5.0	More information on request.
2	Micro switch with gold-plated contacts	≤ 0.03	≤ 0.04	≤ 0.04	(U x I = max. 0.12 VA)

Process connection / Electrical connection

Process connection	Electrical connection	Diaphragm
(M1) M12 x 1,5 male	**(S1)** Plug connector, 3-pin + E, EN 175301-803 C	KLK: ( ) NBR
(G1) G1/4 male	**(K2)** Silicone cable 3 x 0.5 mm²; 600 mm long	KLM: (**V**) FKM
		KLM: (**N**) CR
		KLM: (**E**) EPDM

Options

EXI	for intrinsically safe application
HP (KLM only)	operating pressure up to 150 bar

Ordering

Example for order number

Type		Type		Pressure range code		Process connection		Electr. connection		Micro switch		Diaphragm		Option
KLK	or	KLM	—	025	—	G1	—	S1	—	2	—	V	—	EXI

Your order number

Type		Type		Pressure range code		Process connection		Electr. connection		Micro switch		Diaphragm		Option
KLK	or	KLM	—		—		—		—		—		—	

Compact Pressure Switches *Type Series 96201, 96211, 96221*

Features

- Compact size
- Low & high pressures including vacuum
- Extremely versatile
- Optional DIN and conduit connectors
- NEMA 1 & 4; IP65
- Single pole double throw snap action switching
- Factory preset or field adjustable

Applications

- Pump & compressor monitoring
- Air proving in HVAC systems
- Engine monitoring
- Machine tools
- Hydraulic power units
- Mobile hydraulics
- Medical equipment
- Irrigation systems
- General industrial applications

General Specifications*

Accuracy:	± 2% of full range
Switch: Type: Rating:	 SPDT snap action; single circuit 5 Amp @ 125/250 VAC (Class BB microswitch - standard) 10 Amp @ 125/250 VAC (Class CC microswitch) 5 Amp @ 30 VDC (Class BB and CC microswitches)
Wetted Parts: Process Fitting: O-Ring Seals & Diaphragms: Piston (96201 models):	 Brass (standard); 416 stainless steel (optional) Buna-N (standard) Stainless steel; Teflon back-up ring
Electrical Connection:	12” free leads, #18 AWG
Enclosure Ratings:	NEMA 1 (plastic - standard) NEMA 4 (when ordered with -T4 or -T5 options) IP65 (when ordered with T2 DIN connection option
Pressure Connection:	1/4” NPT male (standard)
Approvals: UL: CSA:	 UL recognized component (UR); With optional conduit connector (-T4 or -T5 option) becomes UL listed. UL File No. E42816. CSA #LR22354

Temperature Range: Series 96201: Series 96211: Series 96221:	 -40° to +165°F (-40° to +74°C) -20° to +165°F (-29° to +74°C) 0° to +165°F (-18° to +74°C)
Adjustment Capability:	Models L96201, L96211 and L96221 are factory set and permanently locked. Models 96201, 96211, and 96221 are field adjustable via an external adjustment sleeve.
Pressure Setpoint Adjustment:	 Secure hex body with open-end wrench; hand turn adjustment sleeve: Clockwise (counterclockwise for vacuum models) to increase. Counterclockwise (clockwise for vacuum models) to decrease set point.
Shipping Weight:	Approximate 0.95 lbs.

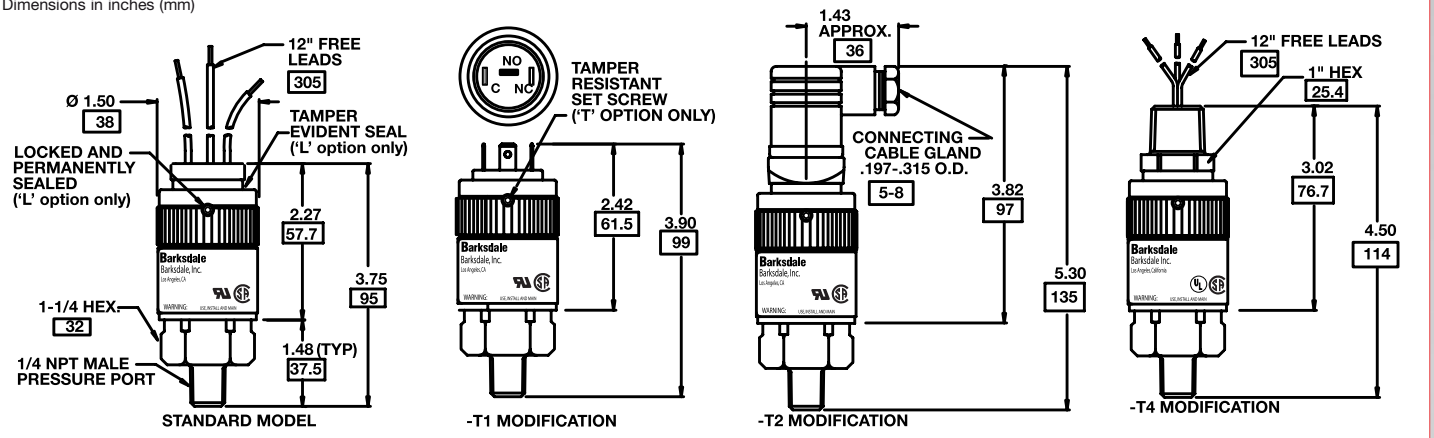
Wiring Code

	PRESSURE		VACUUM	
LEAD	**COLOR**	**PIN**	**COLOR**	**PIN**
NORMALLY CLOSED	BLUE	2	RED	3
COMMON	PURPLE	1	PURPLE	1
NORMALLY OPEN	RED	3	BLUE	2

* See product configurator for additional options.

Technical Drawings

Dimensions in inches (mm)



Product Configurator

Example:		96211-BB3	SS	-T5	-V	

Prefix

L	Factory set and permanently locked (optional)
T	Tamper resistant setscrew (optional)

Base Model

	Adjustable Range				Approx. Deadband	Proof	
	Decreasing - psi (bar)		Increasing - psi (bar)		(Actuation Value)	Pressure	
	Min.	Max.	Min.	Max.	psi (bar)	psi (bar)	
96221-BB1	1" Hg	28" Hg	6" Hg	30" Hg	.5 - 8" Hg	30 (2)" Hg	Vacuum
96211-BB1	2.5 (.2)	12.8 (.9)	3 (.2)	15 (1)	.3 - 3 (.02 - .21)	1000 (68)	Low Pressure Diaphragms
96211-BB2	5 (.3)	31 (2)	6 (.4)	35 (2.4)	.5 - 6 (.03 - .41)	1000 (68)	
96211-BB3	8.5 (.6)	44 (3)	10 (.6)	50 (3.4)	.5 - 8 (.03 - .55)	1000 (68)	
96211-BB4	22.5 (1.5)	112 (8)	25 (1.8)	125 (8.5)	1 - 15 (.07 - 1.03)	1000 (68)	
96211-BB5	70 (5)	220 (15)	80 (5.5)	250 (17)	5 - 40 (.34 - 2.76)	1000 (68)	
96211-BB6	110 (7)	440 (30)	130 (9)	500 (34)	10 - 75 (.69 - 5.17)	1000 (68)	
96201-BB1	190 (13)	450 (31)	250 (17)	600 (41)	30-150 (2.07 -10.35)	7000 (476)	High Pressure Diaphragms
96201-BB2	360 (24)	1450 (105)	430 (29)	1700 (116)	40-400 (2.76 - 27.59)	7000 (476)	
96201-BB3	1450 (105)	3900 (265)	1650 (112)	4400 (300)	100-750 (6.90 - 51.72)	7000 (476)	
96201-BB4	3650 (248)	6700 (456)	4000 (272)	7500 (510)	200-1000 (13.79-68.96)	12000 (816)	
96201-BB5	300 (20)	2500 (170)	380 (26)	3000 (200)	80-500 (5.52-34.48)	7000 (476)	
-CC	10A @ 125/250VAC Limit Switch (replace -BB with -CC)						

Fitting Option

Blank	Brass (Standard)
SS	Stainless steel (not available with vacuum models)

Electrical Connectors

Blank	12" free leads (standard)
-T1	1/4" male spade terminals
-T2	DIN Connector, 43650 type
-T4	1/2" NPT male conduit connector with free leads
-T5	1/2" NPT female conduit connector with free leads

Options

-JXXX	SJO cable, #18 AWG (XXX = inches)
-Z1	Cleaned for oxygen service
-Z12	Gold contact limit swtich, 1 A, 125 VAC
-Z17	DIN 43650 base only (no mating plug)
-Z24	Unshielded cable, #18 AWG PVC
-P1	7/16-20 SAE pressure Fitting with O-ring
-WXXX[1]	Extra wire length (XXX = inches)
-SXXX[2]	Factory preset (consult factory)

Diaphragm/O-ring Material

Blank	Buna-N (standard)
-E	Ethylene propylene (EPR)
-N	Neoprene
-V	Viton®

NOTES:
[1] Not available with DIN connector (-T2 option)
[2] No charge for factory set (L- option) models

OEM Transducer

Type Series 623, 625, 626, 627

Features

- Ideal for OEM applications
- Compact size
- Stainless steel construction
- Ceramic sensor technology
- Current and voltage outputs

Applications

- Water irrigation systems
- Medical gas systems
- HVAC systems
- Pumps and compressors
- Machine tools
- Hydraulic and pneumatic applications
- Mobile hydraulics
- General industrial applications

General Specifications*

Accuracy (LH & R):	±0.5% FSO Typical
Typical Life Cycle:	100 million cycles
Proof Pressure:	2 times rated pressure, or 9000 psi max, whichever is less.
Input/Excitation Voltage: 625 (2-wire): 623 (3-wire): 626 (3-wire): 627 (3-wire):	 9 to 28 VDC 9 to 30 VDC 14 to 30 VDC 14 to 30 VDC
Output: 625 (2-wire): 623 (3-wire): 626 (3-wire): 627 (3-wire):	 4-20 mA 0.5-5.5 VDC 1-11 VDC 0-10 VDC
Zero and Span:	15 mA maximum (no load)
Wetted Parts:	316 Stainless steel, ceramic and Viton® O-ring (Typical)
Enclosure:**	NEMA 4X IP65, IP67 (based on electrical connection)
Pressure Connection:	1/4" NPT standard. Other options available.
Electrical Connection:	PVC jacketed cable standard. Other options available.

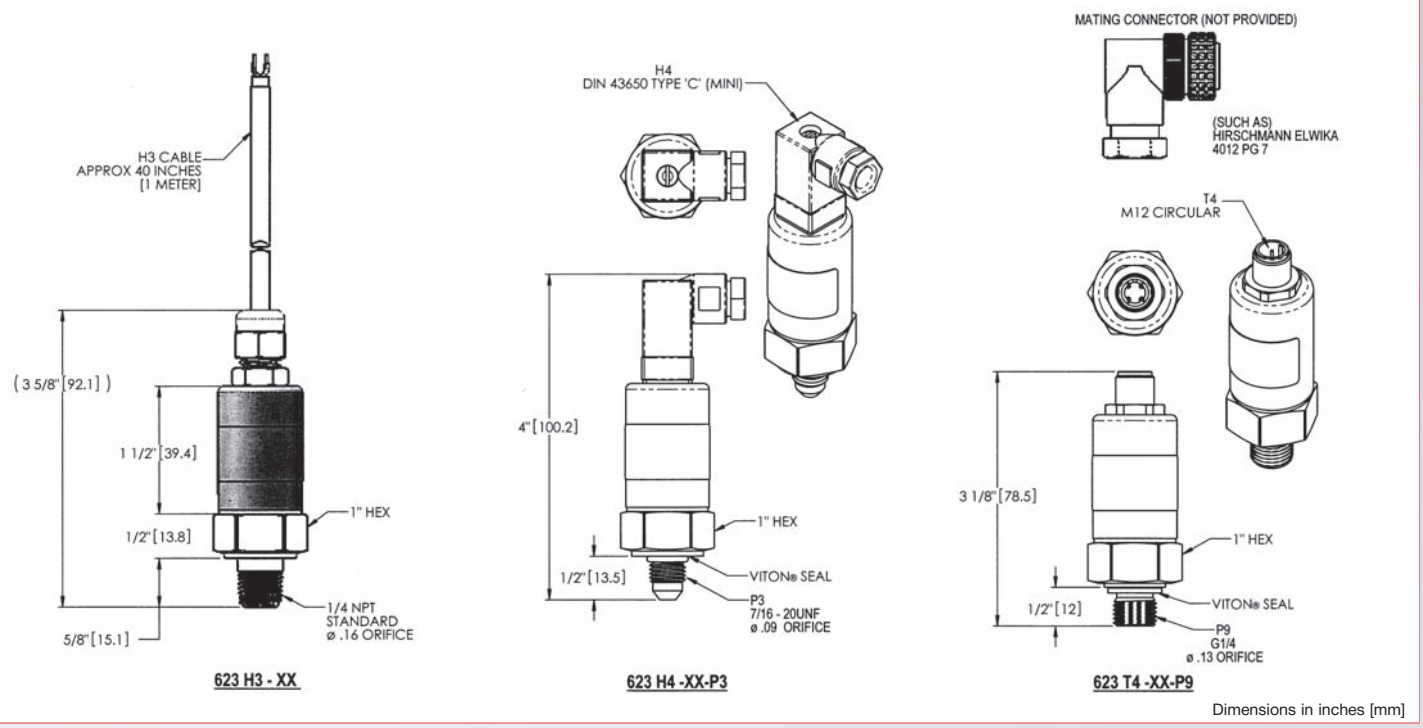
Temperature Ranges: Operating: Compensated: Storage:	 -40°F to +185°F (-40°C to +85°C) 30°F to +130°F (-1°C to +54°C) -40°F to +185°F (-40°C to +85°C)
Temperature Shift: Zero and Span:	±0.06% FS/K over operating temperature range
Vibration:	15 g's, 10-2000 Hz, MIL-STD 202
Approval[1]:	UL 508 and UL 61010-1 (approval pending)
Shock:	50 g's, 11 ms, MIL-STD 202 Method 213, Cond. G.
Weight:	5.1 oz (145 grams) (typical)
Warranty:	1 year

Wiring Code

Electrical Termination		Voltage Output	Current Output
H3	**H4 / T4**	**Series 623/626/627**	**Series 625**
Red	1	+ Excitation	+ Excitation
Black	2	Common	Common
White	3	+ Output	Not used
Drain	4	Case Ground	Case Ground

* See product configurator for additional options.
** Mating connector must be properly installed to preserve enclosure rating

Technical Drawings



Dimensions in inches [mm]

Product Configurator

Example:	625	H3	-05		

Base Model

625	4-20 mA analog output
623	0.5-5.5 VDC analog output
626	1-11 VDC analog output
627	0-10 VDC analog output

Electrical Connection

H3	PVC jacketed cable (1 m)
H4	Mini-DIN 43650 Type “C”
T4	M12 circular connector

Pressure Range[3]

-21	0-30 PSI (0-2 BAR)
-26	0-75 PSI (0-5 BAR)
-05	0-150 PSI (0-10 BAR)
-07	0-300 PSI (0-20 BAR)
-27	0-750 PSI (0-50 BAR)
-11	0-1500 PSI (0-100 BAR)
-13	0-3000 PSI (0-200 BAR)
-16	0-6000 PSI (0-400 BAR)

Options

Blank	Standard
-Z1	Cleaned for oxygen service
-Z15	Calibrated in BAR
-ZXXY[2]	Special Pressure Ranges
-Z10	1 to 5 V output (only available on 623)
-Z11	1 to 6 V output (only available on 623)
-Z12	0.5 to 4.5 V output (only available on 623)
-Z16	0.2 to 10 V output (only available on 626)
-Wxxx	Specify cable length in inches (H3 longer than 40 inches)
-Z19	Built in pressure surge suppressor
-Z20	Fluorosilicone O-Ring

Process Connection

Blank	1/4” NPT Male
-P3	7/16-20 UNF Male
-P9	G1/4 Male

Note 1. For UL 508 and UL 61010-1 (approval pending), use with Class 2 circuit power source.
2. Add suffix ZXXY for special pressure range calibration. XX = significant digits. Y = number of trailing zeros. Example: 130 psi calibration: add -Z131.
3. Other ranges available - consult factory.

Electr. Dual Pressure Switch

Type Switch 2000

Electronic pressure switch for pressure control with internal stainless steel diaphragm, digital display, 2 solid state contacts or 1 solid state plus 1 analog output, linearity error 0.5 % f. s.

Index: B

Features

7-segment LED display, microprocessor controlled, self monitoring with error display
All parameters are configured by keypad, adjustable keypad lock, rugged construction, vibration and shock-proof, long-term stability

Measuring ranges

0...1 bar to 0...600 bar gauge

Applications

OEM applications in hydraulic and pneumatic systems, press construction,
lubricant monitoring, apparatus engineering, machine/machine tool industry, automobile industry, injection molding machines

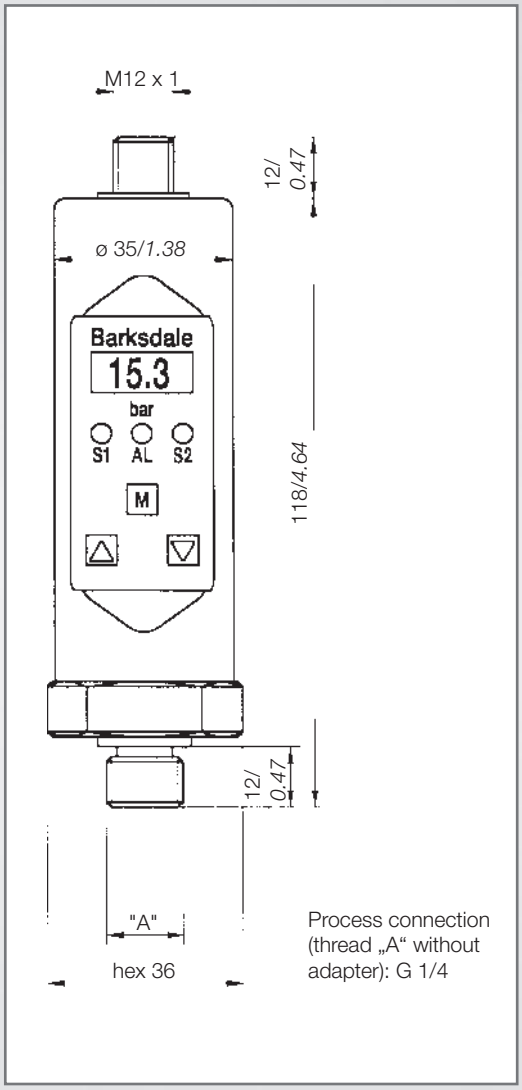
Technical Data

Sensor element:	Piezoresistive silicon measuring cell
Materials: Wetted parts: Electronics housing: Seals:	 Stainless steel, mat. no. 1.4301 Aluminum die-cast FKM
Operating elements:	3 easy-response pushbuttons
System of protection:	IP65
Protection class:	III
Process connection:	G1/4 M
Dimensions:	36 x 130 mm (without plug connector)
Weight:	approx. 200 g
Measuring ranges [bar]:	10 / 50 / 100 / 200 / 400 / 600
Proof pressure [bar]:	15 / 75 / 150 / 300 / 600 / 800
Linearity error:	<±0.5 % v. f. s. at +25 °C
A/D converter: Resolution: Scanning rate:	 10 bit (1024 steps per measuring span) 200/s
Electrical connection:	Plug M12 x 1, 4-pin
Temperature influence:	< ±0.2 % v. f. s./10K
Compensation range:	-10 °C... +70 °C
Repeatability:	±0.1 % v. f. s.
Temperature range: Medium: Electronics: Storage:	 -25 °C... +100 °C -10 °C... +70 °C -30 °C... +80 °C

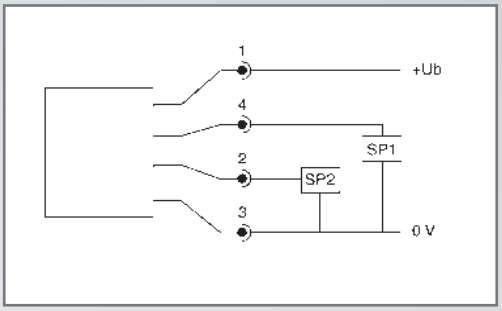
Power supply:	15... 32 V DC, reversed polarity protected (SELV, PELV)
Digital display: Display range: Display rate:	3-digit 7-segment LED display, red, digit height 10 mm -1 ... 999 20/s
Error display:	LED yellow and alphanumeric display
Power consumption:	approx. 50 mA (without load)
Analog output: Current output: Load: Load influence: Scanning rate: Voltage output: Rating: Adjustment range:	 4...20 mA max. Rl = (Ub-12 V)/20 mA Rl = 600 Ohm at Ub = 24 V DC 0.3 %/100 Ohm 5 ms 0...10 V DC max. 10 mA 25 %... 100 % f. s.
Transistor switching outputs PNP: Switching function: Adjustment range for switching point and hysteresis: Switching frequency: Delay Status display(s):	 Normally open/normally closed, standard / window mode and diagnosis function adjustable 0 %... 125 % f. s. max. 100 Hz max. 500 mA, short-circuit proof 0.0 s ... 9.9 s adjustable LED(s) green
Accessories:	Adapter for pressure switch adjustment, damping screw, plug connector
Approvals:	cULus: file no. E42816

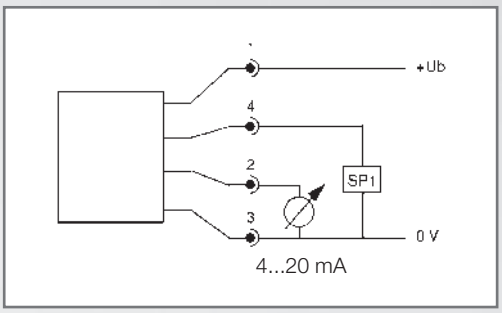
Index: B

Dimensions (in mm / *inch*)

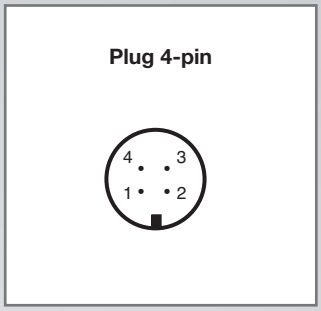


Connection diagram





Plug



Order Numbers

Pressure range	0...10 bar	0...50 bar	0...100 bar	0...200 bar	0...400 bar	0...600 bar
2 switching outputs	0428-017	0428-018	0428-019	0428-020	0428-021	0428-022
1 switching output 1 analog output 4...20 mA	0428-127	0428-128	0428-129	0428-130	0428-131	0428-132

Further measuring ranges on request

Accessories

Order Number	Description
0499-016	Adapter G1/4 IG - G1/4 male thread for optimum alignment of pressure switch
901-0677	Damping screw with 0.2 mm restriction against quick pressure changes and high pulsation rate
907-0357	Plug connector M12 x 1, 4-pin, with screw terminals, angled
907-0344	Plug connector M12 x 1, 4-pin, with screw terminals, straight

Electronic Pressure Switch

Type UDS1V2

Electronic pressure switch for pressure control with internal stainless steel diaphragm, with 2 solid state outputs or 1 solid state output with adjustable hysteresis.

Index: A

Features

- Teach & Go
- Compact construction
- Housing 320° rotatable

Measuring ranges

0...10 bar to 0...600 bar

Applications

OEM applications in hydraulic and pneumatic systems,
press construction,
lubricant monitoring, apparatus engineering,
machine/machine tool industry,
automobile industry, injection molding machines

Technical Data

Sensor element:	Piezoresistive silicon or ceramic measuring cell
Materials: Wetted parts: Electonics housing: Seals:	 Steel, pass., Al_2O_3 PA 6.6 FKM
Operating elements:	2 easy response push bottons
System of protection:	IP65
Protection class:	III
Process connection:	G ¼“ AG Others on request
Dimensions:	approx. Ø 28 x 100 mm (without plug connector)
Measuring ranges:	0…10 bar to 0…600 bar 0…150 to 0…9000 PSI
Electrical connection:	Plug M12x1, 4-pin
Temperature influence:	± 0.2 % f.s./10K
Compensation range:	-10 °C…+70 °C
Repeatability:	+/- 1 % f.s.
Temperature range: Medium: Electronics: Storage:	 -25 °C…+100 °C -25 °C…+80 °C -30 °C…+80 °C
Power supply:	15…32 V DC, reversed polarity protected (SELV, PELV)

Transistor switching outputs PNP: Adjustment range for switching point- and hysteresis*	 0 % …100 % f.s. Max. 100 Hz Max. 200 mA, short-circuit proof
Vibration	10 g/20...2000 Hz
Shock	100 g/11 ms

* only 1SP version (2SP version 15% hysteresis)

Connection diagram

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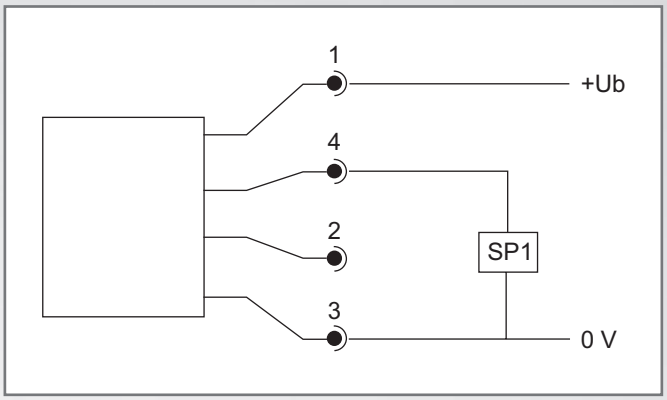
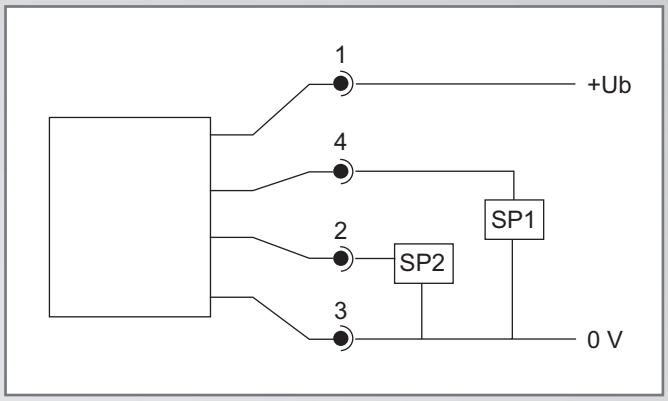
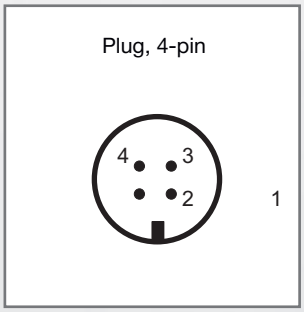
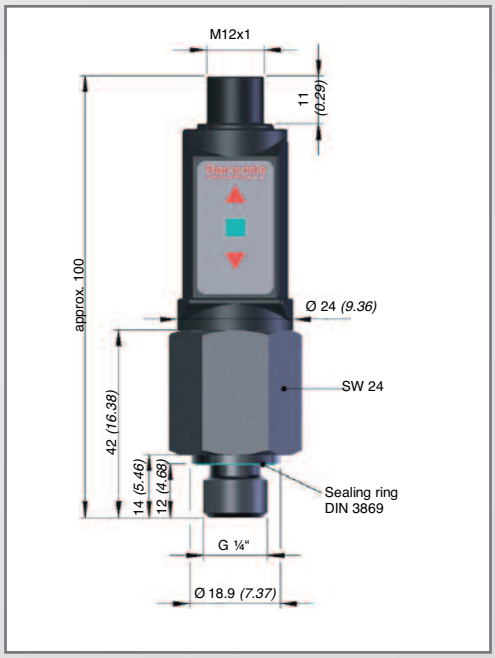




Plug





Order Numbers

Pressure range	0...10 bar	0...100 bar	0...400 bar	0...600 bar
1 switching output with adjustable hysteresis	0421-060	0421-061	0421-062	0421-063
2 switching outputs with 15% hysteresis	0421-064	0421-065	0421-066	0421-067

Accessories

Order Number	Description
907-0357	Plug connector M12x1, 4-pin, with screw terminals, angled
907-0344	Plug connector M12x1, 4-pin, with screw terminals, straight

Electronic Pressure Transducers

Type UPA 2 - Standard

Electronic pressure transducers for general measuring tasks, with internal or flush stainless steel diaphragm, linearity error 0.5% and 0.25% f. s.

Index: A

Features

Variety of measuring ranges
Absolute and gauge pressure ranges
Rugged stainless steel construction
GL approval (German Lloyd)

Measuring ranges

-1...0 bar to 0...800 bar gauge
0...1 bar 0...10 bar absolute pressure

Applications

OEM applications
Hydraulic and pneumatic systems,
test beds,
shipbuilding and offshore applications

Technical Data

Sensor element:	Piezoresistive silicon measuring cell
Materials: Wetted parts: Electronics housing: Seals:	 Stainless steel, mat. no. 1.4301 Stainless steel, mat. no. 1.4301 FKM, EPDM
System of protection:	IP67 with PG/IP65 with plug
Protection class:	III
Process connection:	G1/4 M, G1/2 M manometer connection or quasi flush diaphragm
Dimensions:	Ø32 x approx. 120 mm (with plug connector)
Weight:	250 g

Measuring ranges [bar]:	-1...0	-1...+1	0.2	0.4	
Overpressure [bar]:	2.5	2.5	2.5*	2.5	

Measuring ranges [bar]:	0.6	1	2	5	10	50
Overpressure [bar]:	2.5	3	4	7	15	75

Measuring ranges [bar]:	100	200	400	600	800
Overpressure [bar]:	150	300	500	700	1100

Linearity error:	≤ ±0.5 % f. s. (Option: ≤ ±0.2 % f. s.)

Electrical connection:	Plug 4-pin, DIN EN 175 301-803-A (prev. DIN 43650)
Temperature influence:	≤ ±0.2 % f. s./10K
Compensation range:	-10 °C... +70 °C
Repeatability:	≤ ±0.1 % v. f. s.
Temperature range: Medium: Electronics: Storage:	 -25 °C... +100 °C -25 °C... +80 °C -40 °C... +100 °C
Output signals:	4...20 mA (2 wire) 0...10 V DC (3 wire)
Power supply:	8... 30 V DC, 13... 30 V DC at 0... 10 V, reversed polarity protection (SELV, PELV)
Power consumption:	max. 25 mA at current output max. 5 mA at voltage output
Load:	≤ (Ub-10 V)/20 mA
Delay:	≤ 1 ms
Accessories:	Damping screw to limit pressure peaks
Approval:	GL optional

*Linearity error 1%

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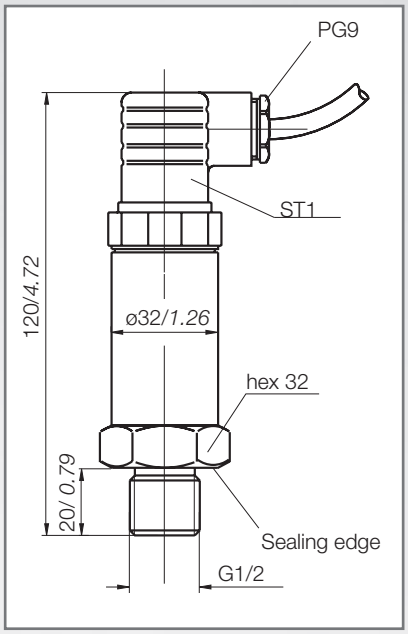
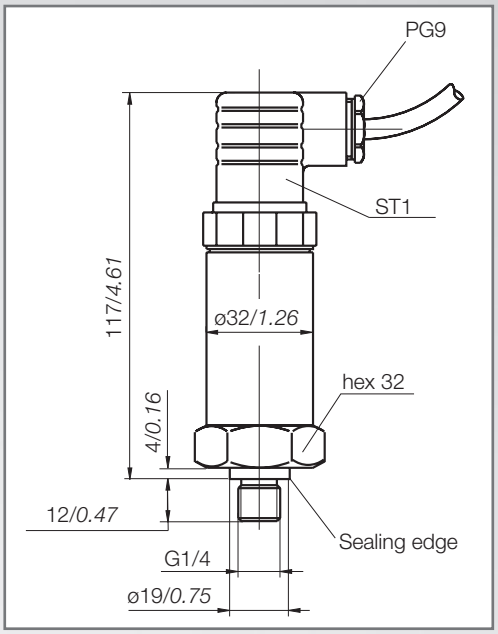
Dimensions (in mm / *inch*)





Electrical Connection

Connection	Current output 4... 20 mA (2-wire)			Voltage output 0... 10 V (3-wire)		
	Plug	Cable	GL cable	Plug	Cable	GL cable
+ Supply	1	brown	blue 1	1	brown	blue 1
- Supply	2	white	blue 2	2	blue	blue 2
+ Signal	---			3	white	white 1
- Signal	---			---		

Order Numbers

Standard pressure reducer DIN 43650, 4... 20 mA			
Measuring ranges [bar] relative pressure	Overpressure [bar]	Order No.	
		G1/2“, flush	G1/4“ M
10	15	0431-032	0431-017
50	75	0431-043	0431-441
100	150	0431-036	0431-315
200	300	0431-042	0431-010
400	600	0431-038	0431-314
600	780	0431-464	0431-238

Further measuring ranges on request

Accessories

Order Number	Description
926-0420	Plug connector, 3-pin + PE, DIN EN 175 301-803-A (prev. DIN 43650)
907-0185	Plug connector, 5 pin M12 x 1, elbow
907-0177	Plug connector, 5 pin M12 x 1, straight
908-0361	Plug connector, 5 pin M12 x 1 incl. 2 m cable
998-9991	Manufacturer test certificate O DIN 55350 part 18 4.2.1
998-9992	Manufacturer test certificate M DIN 55350 part 18 4.2.2

Electronic Temperature Switch (for OEM Users) TempSwitch 2000

Temperature control digital display, 1 or 2 solid state contacts or 1 solid state contact plus 1 analog output 4...20 mA, accuracy class 0,5% f. s.

10 / 05 TS2000 US 923-0877 03/1

Features

7-segment LED display, microprocessor controlled,
self monitoring with error display, display rotable around 330°,
DESINA®-conformity (see also www.desina.de),
all parameters are configured by keypad, tamper proof,
keypad lock, rugged construction,
vibration- and shock-proof, long term stability

Measuring Ranges

0...+100 °C to -30...+150 °C, 0...+212 °F to -22...+302 °F

Applications

Hydraulics and pneumatics (e. g. presses), lubrication monitoring, machine industry, automobile industry, machine tools, injection moulding machines

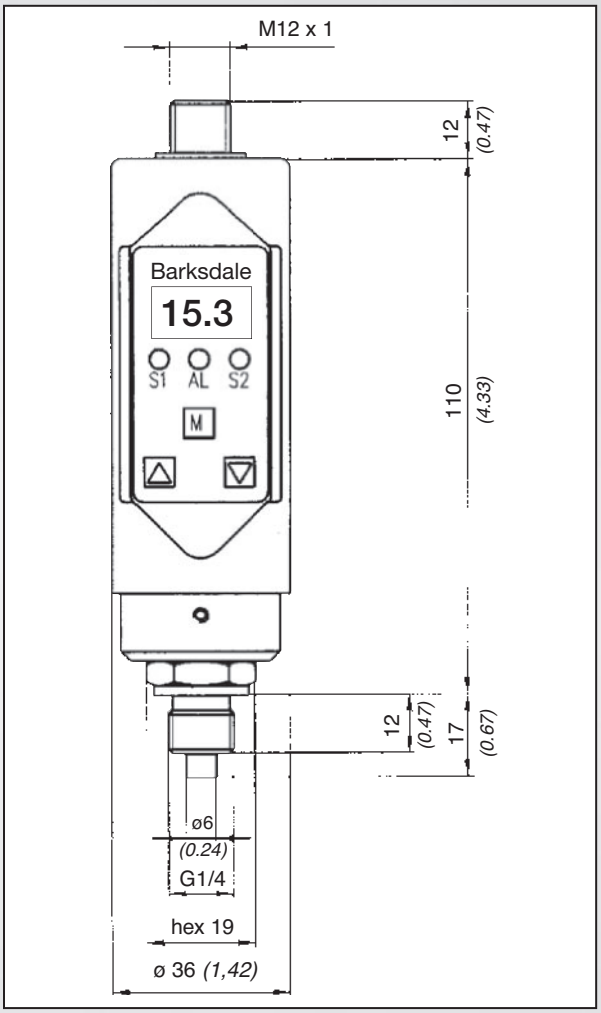
Technical Data

Sensor Element	: PT100-element (Class B)
Materials:	
Wetted Parts	: Stainless steel 1.4435 (SS 316L)
Housing (Electronics)	: Aluminum die-cast
Seals	: FKM
Proof Pressure	: 600 bar (8700 psi)
Operating Elements	: 3 easy response pushbuttons
Protection / Class	: IP65 / III
Process Connection	: G1/4 male
Dimensions (Housing)	: 36 x 130 mm (1,42 x 5,12 inch) (without electrical plug), rotable housing for switch adjustment after mounting
Weight	: appr. 200 g with 17 mm sensor length appr. 0.44 lb. with 0.67 inch sensor l.
Measuring Ranges	: -30...+100 °C, -30... +150 °C 0...+100 °C, 0... +150 °C (-22...+212 °F, -22... +302 °F 0...+212 °C, 0... +302 °F)
Linearity Error	: ±0,5% f. s. at 25 °C (77 °F)
Time Constant	: appr. 40 s
A/D-Converter	
Resolution	: 10 bit (1024 steps per meas. span)
Scanning Rate	: 100/s (for peak value memory)
Electrical Connection	: Plug M 12 x 1, 4-pin, DESINA®-conforming
Sensor Length	: 17 mm (Standard), 25, 50, 100, 150, 200, 250 mm (0.67 inch (standard), 0.98, 1.97, 3.94, 5.91, 7.88, 9.85 inch)
Sensor Diameter	: 6 mm (0,24 inch)
Repeatability	: ±0,1% f. s.
Temperature Range:	
Media	: -30 °C...+150 °C (-22 °F...+302 °F)
Electronics	: -10 °C...+ 70 °C (+14 °F...+158 °F)
Storage	: -30 °C...+ 80 °C (-22 °F...+176 °F)
Power Supply	: 12 ... 32 V DC unregulated, max. 10 % residual ripple, reversed polarity protected
Digital Display	: 3-digit LED display, 7-segment, heigth 10 mm (0,39 inch), red
Display Range	: -99 ... 999
Display Rate	: 20/s
Display Unit	: °C, °F - adjustable
Error Display	: LED yellow and alphanumeric display (Diagnosis function acc. DESINA®)
Power Consumption	: appr. 50 mA (without load)
Analog Output	
Current Output	: 4... 20 mA
Load	: max. Rl = (Ub-12 V) / 20 mA Rl = 600 Ohm at Ub = 24 V DC
Load Influence	: 0,3% / 100 Ohm
Scanning Rate	: 5 ms
Voltage Output	: 0... 10 V DC
Rating	max. 10 mA, short circuit-proof
Adjustment Range	: 25%...100% f. s.
Switching Output(s)	
Switching Function (adjustable)	: Normally open/ normally closed, standard-/windows-mode
Adjustment Range	: 0%... 125% f. s.
Hysteresis	: 0%... 125% f. s.
Diagnosis Function	: SP2 (DESINA®-version)
Switching Frequency	: max. 100 Hz
Contact Rating	max. 500 mA, short circuit-proof
Delay	: 0,0... 9,9 s adjustable
Status Display(s)	: LED(s) green for activated switching point
Options	: electrical plug with screw terminal

Electronic Temperature Switch (for OEM Users) *TempSwitch 2000*

10 / 05 TS2000 US 923-0877 03/1

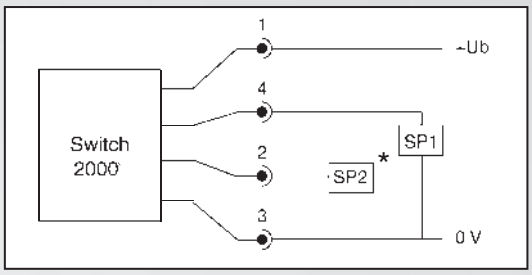
Dimensions in mm *(inch)*



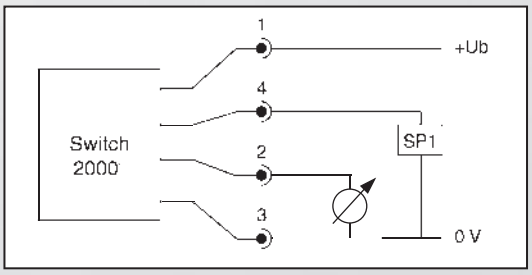
Connection Chart

Plug M 12 x 1, 4-pin	Version with 1 switching output	Version with 2 switching outputs (DESINA ®-version)	Version with 1 switching output and 1 analog output
Pin 1	+Ub (12...32 V DC)	+Ub (12...32 V DC)	+Ub (12...32 V DC)
Pin 2	-	SP2 (0,5 A max.)	analog
Pin 3	0 V	0 V	0 V
Pin 4	SP1 (0,5 A max.)	SP1 (0,5 A max.)	SP1 (0,5 A max.)

Connection Scheme



* SP2 = Diagnosis output (DESINA®-version)



Order Numbers

Measuring range (°C)	**0...+100 °C**	**-30...+150 °C**	**0...+100 °C**	**-30...+150 °C**	**0...+100 °C**	**-30...+150 °C**
Measuring range (°F)	**0...+212°F**	**-22...+302 °F**	**0...+212 °F**	**-22...+302 °F**	**0...+212 °F**	**-22...+302 °F**
Sensor length	**17 mm *(0.67 inch)***		**50 mm *(1.97 inch)***		**300 mm *(11.82 inch)***	
1 Switching output	0628-011	0628-012	0628-013	0628-014	0628-023	0628-024
2 Switching output	0628-015	0628-016	0628-017	0628-018	0628-025	0628-026
1 Switching output **1 Analog output 4...20 mA**	0628-096	0628-097	0628-098	0628-099	0628-100	0628-101
DESINA® **1 Switching output** **1 Diagnosis output**	0628-019	0628-020	0628-021	0628-022	0628-027	0628-028

Accessories

Order Number	Description
907-0357	Electrical plug M 12 x 1, 4-pin, with screw terminal, 90° elbow
907-0344	Electrical plug M 12 x 1, 4-pin, with screw terminal, straight

Level switches

Type UNS1000-BN18

Level- and temperature switch for monitoring hydraulic tanks („Power Packs“).
Modern hydraulic reservoirs have a high specific output volume that can result in high oil temperatures under load. Level-and temperature monitoring is a unrenounceable safety factor for the complete plant.

Index B

Features

For bulkhead unions G1/2“ and M12x1.5
Compact Design

Applications

OEM applications,
Accessories for hydraulic reservoirs,
Mineral oil applications

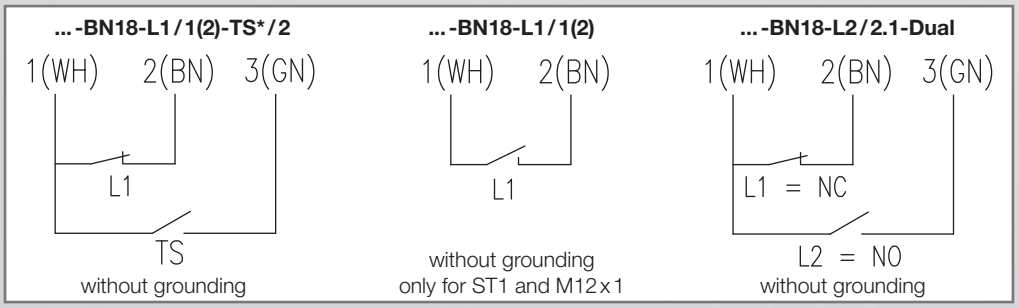
Technical Data

Materials: Bulkhead union: Contact tube: Float stopper: Float:	 Brass Brass Bronze foamed NBR
System of protection:	IP65
Housing:	---
Process connection: male thread:	 G1/2“ DIN ISO 228-1 = T1/2 M20x1.5 DIN 13
Electrical connection:	Plug M12x1, 4-pin, PA Plug DIN EN 175301-803-A (former DIN 43650), 4-pin, PA Cable gland, PA
Electrical values:	max. 24 V AC/DC max. 1 A max. 20 VA/W
Operating temperature:	-10 °C ... +90 °C (14 °F ... 194 °F)

Operating pressure:	max. 4 bar (400 kPa = 58 psi)
Density:	min. 0.64 g/cm³
Depth of immersion at density 1:	15 ±2 mm
Temperatur switch: Temperature range: Indexing tolerance: Differential gap: Contact:	bimetal 10 K-steps +60 °C ... +90 °C (140 °F ... 194 °F) ±5 K 30 ±15 K NC (the contact is closed at room temperature)
Dual switch: Switching points: Distance L1 - L2: Kind of contact, opt.:	 Standard: 1 float for 1 switching point Dual: 1 float for 2 switching points min. 32 mm acc. to ASAM (L1 = Pin 1+2/ L2 = Pin 1 + 4) only with M12x1
Approval:	---

Connection diagram

Optional: Contacts acc. to ASAM



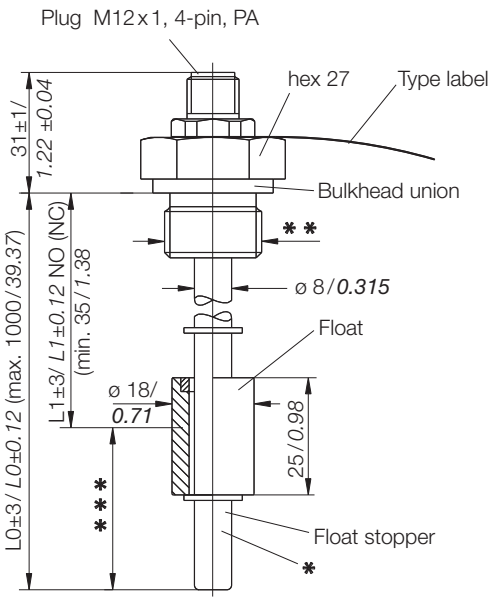
Accessories

Order Number	Description
907-0013	ST1 socket acc. to DIN EN 175 301-803-A (former DIN 43650) with PG9 made from PA
907-0344	M12x1-socket (circular connector, straight) with PG9 made from PA

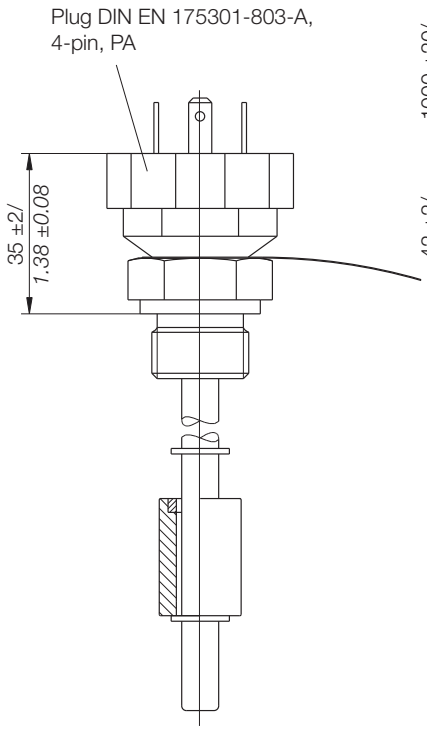
Dimensions (in mm / *inch*)

Index B

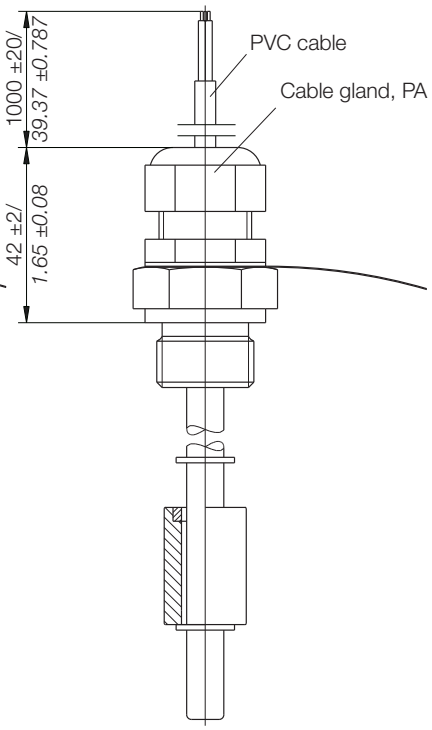
* TS: temperature switch
** T1/2: male thread G1/2“
M20x1.5: male thread
*** with TS: min. 40/*1.57*
without TS: min. 25/*0.98*



UNS1000-MS/-M12x1-BN18-L1/1(2)-TS*/2**



UNS1000-MS/-ST1-BN18-L1/1(2)-TS*/2**



UNS1000-MS/-PG-BN18-L1/1(2)-TS*/2**

Order Numbers

Further lengths and temperature switching points upon request

Order No.	Article description UNS1000-MS/...	Length L_0 [mm]		Article description UNS1000-MS/...	Length L_0 [mm]
0122-172	...M20x1.5-ST1-BN18-L1/1(2)-TS70/2	70 ... 400	0122-190	...T1/2-ST1-BN18-L1/1(2)-TS70/2	70 ... 400
0122-173	...M20x1.5-ST1-BN18-L1/1(2)-TS70/2	401 ... 600	0122-191	...T1/2-ST1-BN18-L1/1(2)-TS70/2	401 ... 600
0122-174	...M20x1.5-M12x1-BN18-L1/1(2)-TS70/2	70 ... 400	0122-192	...T1/2-M12x1-BN18-L1/1(2)-TS70/2	70 ... 400
0122-175	...M20x1.5-M12x1-BN18-L1/1(2)-TS70/2	401 ... 600	0122-193	...T1/2-M12x1-BN18-L1/1(2)-TS70/2	401 ... 600
0122-176	...M20x1.5-PG-BN18-L1/1(2)-TS70/2	70 ... 400	0122-194	...T1/2-PG-BN18-L1/1(2)-TS70/2	70 ... 400
0122-177	...M20x1.5-PG-BN18-L1/1(2)-TS70/2	401 ... 600	0122-195	...T1/2-PG-BN18-L1/1(2)-TS70/2	401 ... 600
0122-178	...M20x1.5-ST1-BN18-L1/1(2)	55 ... 400	0122-196	...T1/2-ST1-BN18-L1/1(2)	55 ... 400
0122-179	...M20x1.5-ST1-BN18-L1/1(2)	401 ... 600	0122-197	...T1/2-ST1-BN18-L1/1(2)	401 ... 600
0122-180	...M20x1.5-M12x1-BN18-L1/1(2)	55 ... 400	0122-198	...T1/2-M12x1-BN18-L1/1(2)	55 ... 400
0122-181	...M20x1.5-M12x1-BN18-L1/1(2)	401 ... 600	0122-199	...T1/2-M12x1-BN18-L1/1(2)	401 ... 600
0122-182	...M20x1.5-PG-BN18-L1/1(2)	55 ... 400	0122-200	...T1/2-PG-BN18-L1/1(2)	55 ... 400
0122-183	...M20x1.5-PG-BN18-L1/1(2)	401 ... 600	0122-201	...T1/2-PG-BN18-L1/1(2)	401 ... 600
0122-184	...M20x1.5-ST1-BN18-L2/2.1-Dual	55 ... 400	0122-202	...T1/2-ST1-BN18-L2/2.1-Dual	55 ... 400
0122-185	...M20x1.5-ST1-BN18-L2/2.1-Dual	401 ... 600	0122-203	...T1/2-ST1-BN18-L2/2.1-Dual	401 ... 600
0122-186	...M20x1.5-M12x1-BN18-L2/2.1-Dual	55 ... 400	0122-204	...T1/2-M12x1-BN18-L2/2.1-Dual	55 ... 400
0122-187	...M20x1.5-M12x1-BN18-L2/2.1-Dual	401 ... 600	0122-205	...T1/2-M12x1-BN18-L2/2.1-Dual	401 ... 600
0122-188	...M20x1.5-PG-BN18-L2/2.1-Dual	55 ... 400	0122-206	...T1/2-PG-BN18-L2/2.1-Dual	55 ... 400
0122-189	...M20x1.5-PG-BN18-L2/2.1-Dual	401 ... 600	0122-207	...T1/2-PG-BN18-L2/2.1-Dual	401 ... 600

Experts

Specialists for monitoring and control of:

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- **Temperature**
- **Level**
- **Flow**

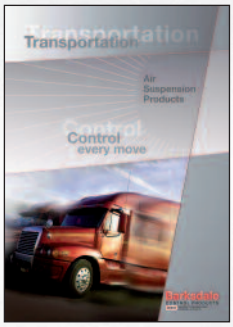
Barksdale develops market-focused solutions for customers in the fluid power, transportation and industrial equipment markets focusing on applications that include:

Mobile and stationary hydraulics

Shipbuilding

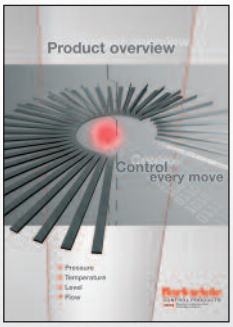
Oil and gas exploration

Truck, trailer and bus suspensions



Sensorics for hydraulic power packs

Product overview



Barksdale GmbH
Dorn-Assenheimer Str. 27
61203 Reichelsheim
Germany
Phone: +49 6035 949-0
Fax: +49 6035 949-111/ -113
E-Mail: info@barksdale.de
www.barksdale.de

Barksdale Inc.
3211 Fruitland Avenue
Los Angeles,
CA-90058-0843
USA
Phone: +1 323 589-6181
Fax: +1 323 589-3463
www.barksdale.com

Barksdale China
33F Huaihai Plaza
1045 Central Huaihai Road
200031 Shanghai
Phone: +86 2161 273000
Fax: +86 2164 733298
www.barksdalechina.com

Barksdale India
SF-4
Ansal Fortune Arcade, Sector-18
201301 Noida
Phone:: +91 1202 510 522
Fax: +91 1202 510 520
E-Mail: manojsingh@barksdale.in

Specifications are subject to changes without notice. Art-No: 923-1764 Rev.: –

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