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Operating Instructions Compact Piston and Diaphragm Pressure Switches Series 8000

1. Product description

The pressure switches are specifically designed for monitoring and controlling of operations using maximum and minimum pressures. A micro switch triggers an electrical signal when minimum or maximum pressure are reached.

Application according to instructions

Pressure switches must only be used for applications specified in the instructions.
This means that the temperature has to be within the specified ranges, the pressure values and the electrical rating must not exceed the values specified.
Attention: This device is not designed to be used as the only safety relevant element in pressurized systems according PED 97/23/EC.

2. Instructions on the use of pressure switches

General instructions
Pressure peaks and pressure shocks exceeding the maximum operating pressure are inadmissible. The maximum operating pressure is the upper final value of the adjustable range or, if specified, the pressure indicated as maximum operating pressure. Exceeding the maximum operating pressure affects the performance and the life span of the product and may damage it. Pressure switches must be mounted as free of vibration as possible.

Contact protection

The micro switches used are normally suitable for both direct and alternating current operation. Inductive, capacitive and lamp loads may, however, considerably reduce the life expectancy of a micro switch and, under extreme circumstances, even damage the contacts. Depending on the application spark supression and current limiting is recommended.

Application in hazardous locations

The pressure switches Series 8000 with optional EXI are approved for applications in hazardous locations for intrinsically safe circuits. Units designed for intrinsically safe EXI application must be operated with a switch amplifier (see page 2 fig. 1). They are only for use in an approved intrinsically safe circuit.
Approval class and identification characteristics according to type label information must be observed. The models having a lightalloy (Aluminum) enclosure or part of enclosure must be protected against all impact or friction which can ignite the explosive atmosphere. EC-Design approved types are marked with a label according to ATEX 95 (page 2).

Operating life time

The switches are designed for an operating life time of at least 1 million cycles when used under normal design criteria.

3. Installation

Pressure and electrical connections must be provided by professional or trained staff following the general state-of-the-art standards (See wiring diagram on page 4). **Installation / removal must only occur with all sources of energy (electrical and hydraulic / pneumatic) disconnected.**

The standard flange version (CETOP) can be mounted directly on the hydraulic blocks. For pipe connection mounting blocks with two or four bores are available for wall mounting (ø5.6 mm). (see page 4)

4. Set point adjustment

In pressure switches, a displacement of the pressure sensing element occurs with a change in pressure. The displacement of the pressure sensing element operates a microswitch.
Any set point adjustment may be performed by the user.
Upon delivery of the product, the set point is approximately in the middle of the adjustable range.

For an extra charge, fix set points may be adjusted by our factory. In this event, the point will be indicated on the type plate or separate plate, i = increasing, d = decreasing.
The set point is adjusted by turning the adjustment screw.

- Allow pressure switch to reach the desired switch pressure.
- Turn adjustment screw clockwise to increase pressure setpoint or counterclockwise to decrease pressure setpoint.

Please note: Please consult the wiring diagram for the contact status at atmospheric pressure. (see wiring diagram page 4)

Precise adjustment of set point to actuate on increasing pressure

1. Lower system pressure to 0 bar.
2. Increase pressure slowly and check if micro switch is actuated at desired switch pressure.
3. If necessary, readjust by turning the adjustment screw
4. Repeat step 1 - 3 until microswitch operates at desired switch pressure.

Precise adjustment of set point to actuate on decreasing pressure

1. Increase pressure up to a point clearly above the desired switch pressure (at least, switch pressure plus max. hysteresis; not above max. operating pressure).
2. Lower pressure slowly and check if micro switch is actuated at desired switch pressure.
3. If necessary, readjust by turning the adjustment screw.
4. Repeat step 1 - 3 until microswitch operates at desired switch pressure.

5. Maintenance

The country specific test intervals for monitoring plants should be base on the PED and ATEX guideline are to be observed. The pressure switch is maintenance free.
Checking the set points lies within the discretion of the user.

6. Transport and storage

Severe shock and vibrations, also during transport, should be avoided. Storage should be dry and clean.

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Standard model

81.. - ... - .

Compact pressure switch with CETOP connection flange LK 44 mm
and steel piston for high pressure or Elastomer diaphragm
for pressures up to 40 bar,
adjustable switch contact,
housing aluminum, optional in Stainless Steel
optional with ATEX Exia approval for GD

Product Configurator

Example:	8	A	A	1	- PL1	- B		-UL[5]

Series 8000

Process Connections

1[1]	Cetop connection flange 40 x 40
3	G1/4" male, 40x40
4	G1/4" female, 90° side entry
A	1/4" NPT female
C	1/8" NPT female
D	1/4" NPT female, 90° side entry
E	7/16 SAE-4 20 UNF

SPDT Contacts

1	Silver
2	Gold-plated

Electrical Connectors

- PL1	Plug DIN 43650 A, IP65 (UR only)
- PL2	Plug M12, 4-pol. without female plug, IP67 (UR only)
- PL5	Plug M12, 5-pol. without female plug. (UR only)
- CA3	Cable gland, 27.5" (0.7 m) cable, neoprene jacketed, IP68
- CD1[2]	1/2" NPTM AWG 20 with 24" (60 cm) leads (3 leads + ground)

Options[3]

- EXI	Intrinsically safe EXia (not UL)
- GL	Shipboard GL approval (not UL)
- LH	Small hysteresis
- VA	300 series stainless steel housing

Seals

- B	Buna -N
- V	Viton®
- E	EPDM
- N	Neoprene

Adjustable Range

	Adjustable Ranges (decreasing pressure) psi	(bar)	(increasing pressure) psi	(bar)	Max. Hysteresis[4] (Dead-band)	Proof Pressure psi	(bar)
Diaphragm							
A	5.8 - 82	(0.4 - 5.7)	6.0 - 87	(0.4 - 6.0)	≤15% of max adjustable range	1200	(80)(*)
B	29 - 246	(2.0 - 17)	43 - 290	(3.0 - 20)		1200	(80)(*)
C	43 - 600	(3.0 - 41)	58 - 650	(4.0 - 45)		1200	(80)(*)
Piston							
D	43 - 2320	(3.0 - 160)	73 - 2610	(5.0 - 180)	≤15% of max adjustable range	8700	(600)
E	430 - 4300	(30 - 300)	730 - 5075	(50 - 350)		8700	(600)
F	800 - 7550	(55 - 520)	1160 - 8700	(80 - 600)		13000	(900)

(*) Proof pressure 2900 psi (200 bar) on request (May shorten the lifetime of the switch).

Notes:
[1] Model 81XX- at pressure ranges is (A to E) delivered with 2 spring clips and 2 mounting screws 5 x 60 mm, steel 10.9, galvanized (hex 4). Pressure range (F) is delivered with 4 mounting screws.

[2] Contact rating for silver contact is 3A @ 125 VAC.

[3] Consult factory for additional options.

[4] Consult sale drawing for dead-band chart

[5] Not applicable with -EXI and -GL options

Use in Hazardous Locations

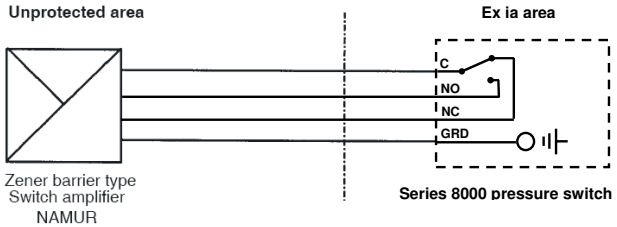

Fig. 1: Operation of Barksdale pressure switches in intrinsically safe areas

Approval data:

Approvals:	UL / cULus (CSA) IP65 (DIN-plug), IP68 (cable) GOST R/K Intrinsically safe Ex II 1GD EXia IIB T6 (DIN plug) - EXI EXia IIC T6 (cable) - EXI GL approval, Type D
Certificate No:	ISSeP03ATEX119X IP6X T 100 °C
Ambient Temperature Range: Piston Switch: Diaphragm Switch:	 -40°F to +176°F (-40°C to +80°C) -4°F to +176°F (-20°C to +80°C)
Electrical data for intrinsically safe application:	U_i = 28 V I_i = 50 mA C_i = 40 pF L_i = 4 µH

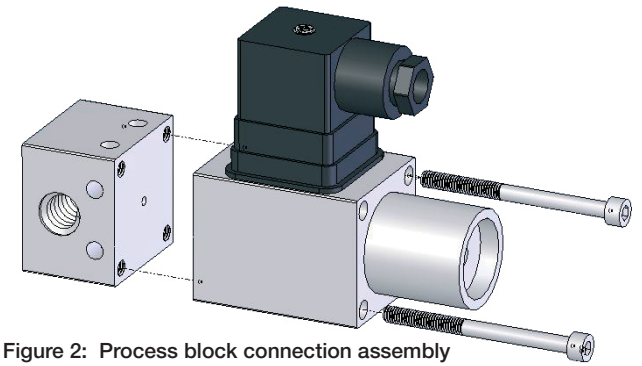

Figure 2: Process block connection assembly

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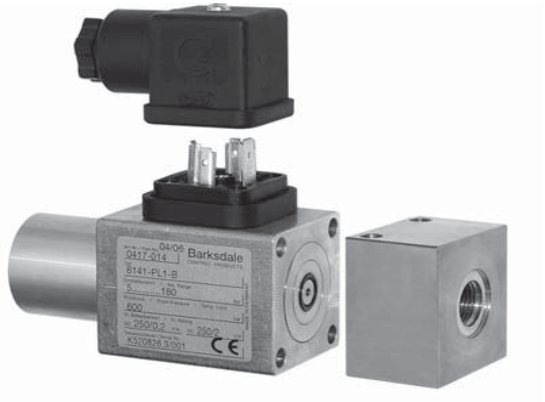
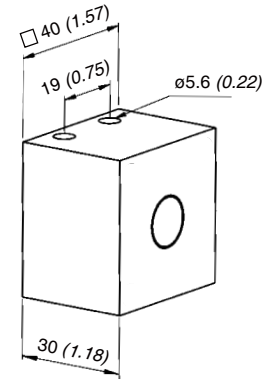
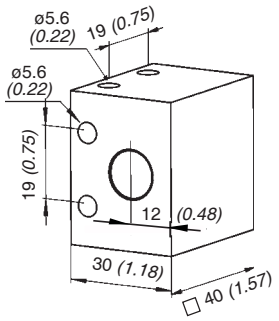




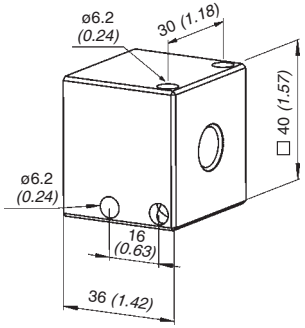
Standard Straight

Order Number	Process Connection	Material
906-0947	G1/4 IG	Stainless Steel
906-0946	1/4“ NPT IG	Stainless Steel



90° Side Entry

Order Number	Process Connection	Material
906-0054	CETOP	Aluminum
906-0926	G1/4 IG	Stainless Steel
906-0927	1/4“ NPT IG	Stainless Steel



Retrofit Connection
For 96100 & X1T

Order Number	Process Connection	Material
906-0919	G1/4 IG	Aluminum

Torque to tighten the process connection to the pressure switch: 35...44 Lbj/inch.

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Electrical Ratings Silver contacts 8 . . 1 -

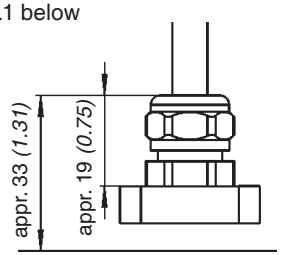
Silver contacts	Inductive load	Resistive load
30 VDC	3.0 A	4.0 A
250 VDC	0.2 A	0.2 A
250 VAC	2.0 A	3.0 A
125 VAC	3.0 A	5.0 A
Min. applicable load: 160 mA at 5 V DC		

Electrical Ratings Gold plated contacts 8 . . 2 -

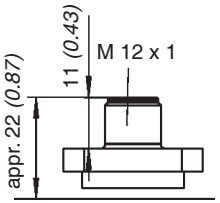
Gold plated contacts	Resistive load	Intrinsically safe circuits	
30 VDC	0.1 A	Umax	28 VDC
8 VDC	0.1 A	Imax	50 mA
125 VAC	0.1 A		
Min. applicable load: 1 mA at 5 V DC			

Electrical Connections

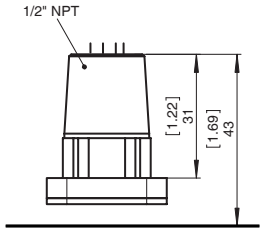
See PL1 below



CA3

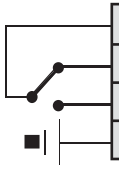


PL2 & PL5



CD 1

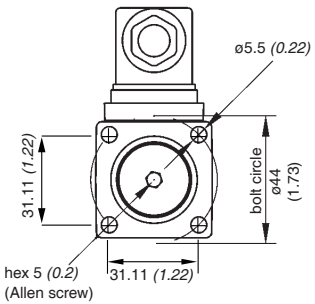
Wiring Code (contact status at atmospheric pressure)

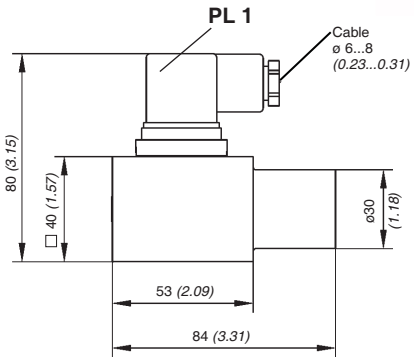


	DIN 43650 Plug (PL1)	M12 Plug (PL2/5)	Cable Gland (CA)	1/2" NPT Conduit w/ Free Leads (CD1)
Common	1	1	Brown	Purple
Normally Closed	2	2	Black	Blue
Normally Open	3	4	Gray	Red
Ground	GRD	3	Green/Yellow	Green/Yellow

Standard model (CETOP)

Dimensions in mm *(inch)*





4 x ø5,5 (Pitch circle-ø 44) for alternative mounting with screw M 5 x 60 DIN 912 600 (Pressure range up to 600 bar) has to be mounted with 4 screws. All lower pressure ranges can be mounted with 2 screws in diagonal order.
Sufficient screws as well as the electrical plug PL1 are attached.

Adjustable Ranges and Proof Pressures

	Adjustable Ranges (decreasing pressure) psi	(bar)	(increasing pressure) psi	(bar)	Max. Hysteresis[4] (Dead-band)	Proof Pressure psi	(bar)
Diaphragm							
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F	800 - 7550	(55 - 520)	1160 - 8700	(80 - 600)		13000	(900)

(1): Proof pressure 200 bar *(2900 psi)* on request (May shorten the lifetime of the switch).

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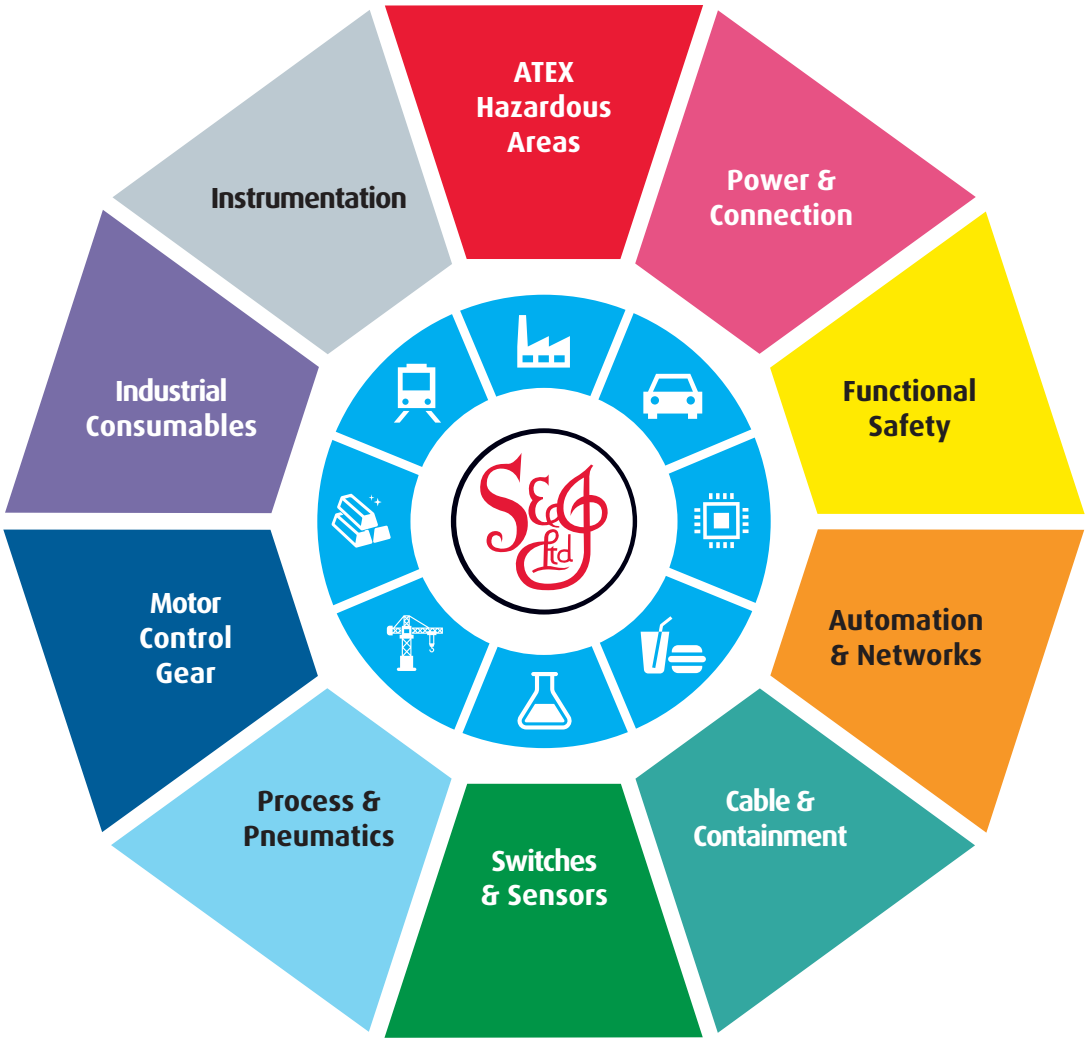

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