Standard version

92…1 – PL1 – V - …

Compact pressure switch with G1/4” female thread or flange, with elastomer membrane and steel piston for high pressure,

adjustable switch contact,

housing aluminium or stainless steel,

optionally with marine approval

Order code for standard units (more versions upon request)

Base modell							
9							
	Process connection						
	2				G1/4" IG DIN ISO 228-1		
	3				G1/4" IG DIN ISO 228-1 with 2 mounting holes (Ø 5,5mm / 20mm distance)		
	4				Flange connection, housing only in VA (SS)		
		Pressure Ranges, decreasin (increasing), bar					
		02			1.5 ...14 (2 ... 16) diaphragm version		
		03			1.5 ...27 (3 ... 30) diaphragm version		
		1			6 ... 44 (10 ... 50) piston version		
		2			15 ... 185 (20 ... 200) piston version		
		3			35 ... 360 (40 ... 400) piston version		
			Micro Switch Contact				
			1		Silver contact		
				Electrical Connection			
				-PL1	Cube plug DIN EN 175301-803A (IP65)		
					Sealing		
					-B	NBR (fluid temp. range -20°...+80°C)	
					-E	EPDM (fluid temp. range -40°...+80°C) - not for diaphragm	
					-V	FKM (fluid temp. range -20°...+80°C) - not for diaphragm	
						Options	
						-VA	Housing 1.4305 (for process connection 3 & 4 only)
							Approvals
							-GL Marine approval
Example							
9	3	2	1	-PL1	-B	-VA	-GL

Fig. 10: Order code

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Operating Instructions

Compact Pressure Piston & Diaphragm Switches Type Series 9000

Barksdale
CONTROL PRODUCTS

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Specifications are subject to changes without notice!

1 Intended Applications

The pressure switches are specifically applied 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.

DANGER

The switch may only be used in the specified fields of application (see type plate).

The temperature has to be within the specified ranges, the pressure values and the electrical rating must not exceed the values specified.

Observe also the applicable national safety instructions for assembly, commissioning and operation of the switch.

The switch is not designed to be used as the only safety relevant element in pressurized systems according to DGR 2014/68/EU.

IMPORTANT

Suitable media:
All common hydraulic oils and fluid greases, and, with restrictions, aqueous media or gases. If the media used tend to resonating or hardening of any kind the required cleaning work must be performed at the specified intervals to avoid malfunctions or damage to the device.

Using aqueous, non-lubricating media or gases for piston pressure switches will inevitably result in a shorter service life of the devices, and is therefore not recommended. In each case the suitable gasket and diaphragm materials must be selected in accordance with the medium used, and the respective approvals must be observed.

2 Safety Instructions

The safety instructions are intended to protect the user from dangerous situations and/or material damage.

In the operating instructions the seriousness of the potential risk is designated by the following signal words:

DANGER

Refers to imminent danger to men.

Nonobservance may result in fatal injuries.

WARNING

Refers to a recognizable danger.

Nonobservance may result in fatal injuries, and destroy the equipment or plant parts.

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CAUTION

Refers to a danger.

Nonobservance may result in light injuries and material damage to the equipment and/or to the plant.

Refers to important information essential to the user.

Disposal

The equipment must be disposed of correctly in accordance with the local regulations for electric/electronic equipment.

The equipment must not be disposed of with the household garbage!

3 Standards

The standards applied during development, manufacture and configuration are listed in the CE conformity and manufacturer's declaration.

4 Warranty/Guaranty

Warranty

Our scope of delivery and services is governed by the legal warranties and warranty periods.

Terms of guaranty

We guaranty for function and material of the single- / dual- pressure switch under normal operating and maintenance conditions in accordance with the statutory provisions.

Loss of guaranty

The agreed guaranty period will expire in case of:

changes or modifications to the switch/housing/fitting
incorrect use,
incorrect installation or
incorrect handling or operation contrary to the provisions of these operating instructions.

No liability is assumed for any damage resulting therefrom, or any consequential damage.

5 Transport/Storage

CAUTION

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

6 Installation/Commissioning

DANGER

Only install or uninstall the switch when deenergized (electrically and hydraulically/pneumatically).

Pressure connection and electrical connection must be carried out by trained or instructed personnel according to state-of-the-art standards.

The switch must only be installed in systems where the maximum operation pressure P_{max} is not exceeded (see the name plate).

WARNING

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 (see Fig. 9 or the nameplate). Exceeding the max. operating pressure affects the performance and the life span of the product and may damage it.

Pressure switches must be mounted vibrationless.

WARNING

Check the switch regularly for functioning.

If the switch does not work properly, stop operation immediately!

IMPORTANT

The standard G1/4” female thread can be mounted directly on the pipe connection. The mounting with a screw-wrench SW30 (width across flats 1.18”)(only on the thread block (see Fig. 7).

Torque: max. 30 Nm (22 ft lb(f))

IMPORTANT

All pressure switches are tested for proper functioning before they leave the factory. The factory proof pressures are stated on the type plate.

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 suppression and current limiting is recommended (see figures 1 to 4).

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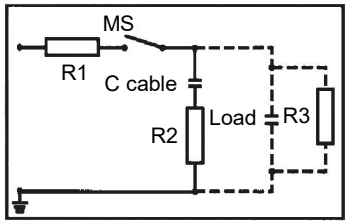

Fig. 1: Protection in case of capacitive loads R1: Protection against starting current rushes R2, R3: Protection against high discharge currents

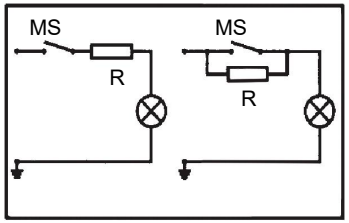

Fig. 2: Lamp load provided with resistance in parallel or series connection to switch of condensators

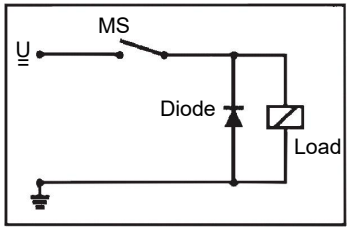

Fig. 3: Protection in case of continuous current and inductive load by recovery diode

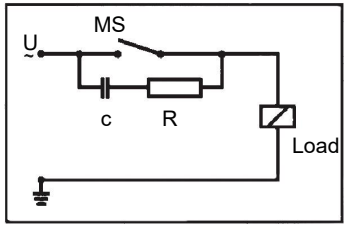

Fig. 4: Protection in case of alternating current and inductive load by RC-link

Set point adjustment

IMPORTANT

Factory-Provided: pressure switch point setting
We confirm for pressure switches that have been factory set the setting will be detailed on the label name plate.

Warranty is not applicable for any changes that may occur due to transportation or installation. For critical applications we recommend the setting is checked and re-set if cecessary after installation and wirding of the pressure switch.

In pressure switches, a displacement of the pressure sensing element (piston or diaphragm) occurs with a change in pressure. Following the displacement of the pressure sensing element operates a microswitch.

Upon delivery of the product, the set points are likely to be found in the middle of the adjustable range. On request, fix set points may be adjusted by our factory. In this event, the point will be indicated on the type plate or any separate plate, s = increasing, f = decreasing.

The set point is adjusted by turning the captive adjustment screw (see Figure 7).

Allow pressure switch to reach the desired switch pressure.

Turn adjustment screw clockwise or counterclockwise to actuate the micro switch.

☞	**IMPORTANT**
Please consult the wiring diagram for the contact status at atmospheric pressure (see).	

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
- Repeat preceding steps (1. to 3.) until microswitch operates at desired switch pressure.

Precise adjustment of set point to actuate on decreasing pressure

- 4. Increase pressure up to a point clearly above the desired switch pressure (at least, switch pressure plus max. hysteresis; not above max. operating pressure).
- 5. Lower pressure slowly and check if micro switch is actuated at desired switch pressure.
- 6. If necessary, readjust by turning the adjustment screw
- Repeat preceding steps (4. to 6.) until microswitch operates at desired switch pressure.

Electrical connections, dimensions in mm *(inch)*

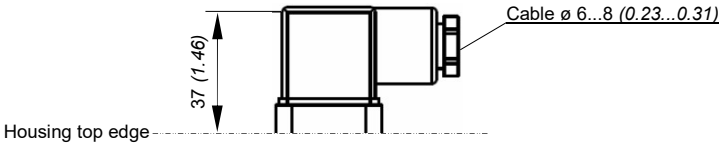

Fig. 5: Standard: PL1 (others – only on request)

Wiring code (contact status at atmospheric pressure)

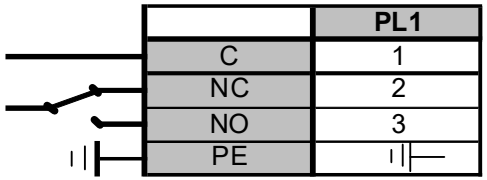

Fig. 6: Wiring Code

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7 Maintenance/Cleaning

Maintenance

The pressure switch is maintenance free. Checking the set points lies within the discretion of the user. The usual preventive maintenance work in accordance with the PED guidelines must always be carried out.

Please note that small setpoint drifts may occur during the initial use of the switch (run-in period). To minimize the setpoint drift we can perform a run-in (ageing) process in our works on request. Larger or continuing setpoint drifts during the normal use of the switch may indicate that the measuring system is not used correctly within the specified limits, exceeding the design criteria or is worn-out. This might lead to metal or elastomer fatigue of the measuring system and it therefore should be replaced before an ultimate rupture of the metal might take place. Please consult your supplier or Barksdale directly for guidelines.

8 Technical Data

Dimensions in mm *(inch)*

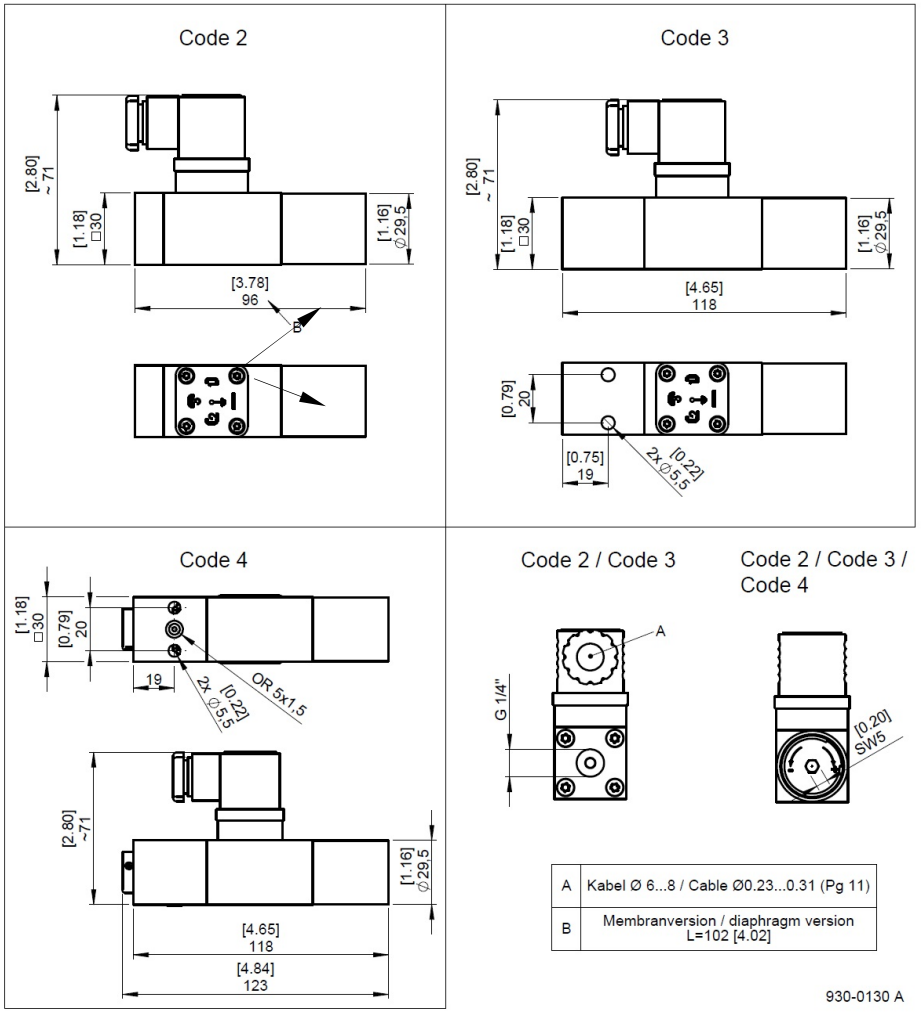

Fig. 7: Compact pressure switch type Series 9000, standard model

The standard G1/4" female thread can be mounted directly on the pipe connection. The mounting with a screw-wrench (SW30 (width across flats 1.18") only on the thread block (see Fig. 7). The electrical plug PL1 are included in the delivery. Torque on the thread block: max. 30 Nm (22 ft lb(f))

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Adjustable ranges

Pressure range code [bar]	Adjustment range (Increasing pressure) [bar]	Adjustment range (Decreasing Pressure) [bar]	Max. hysteresis at full range max %	Max. operating pressure [bar]	Proof pressure (short term) [bar]
02	2 ... 16	1.5 ... 14	≤ 18%	40	60
03	3 ... 30	1.5 ... 27	≤ 10%	40	60
1	10 ... 50	6 ... 44	≤ 18%	250	300
2	20 ... 200	15 ... 185	≤ 10%	250	300
3	40 ... 400	35 ... 360	≤ 10%	500	600

Fig. 8: Pressure ranges

Electrical Ratings Silver Contacts

Silver contacts	Inductive load	Resistance load
250 V AC	2,5 A	10,0 A
24 V DC	1,0 A	6,0 A
Minimum load values: 20 mA at 24 V DC		

Fig. 9: Electrical ratings

☞	**IMPORTANT**
We recommend to use a prefuse of the maximum current rating from the table above according to the load switched.	

Operating life time

Normal expected service life (expressed in the number of cycles over the full adjustment range) is appr. 1 million for the pressure switch. This may be extended to 2.5 million cycles max. if only a part of the adjustment range is used (about 20%).

Switch sensor life may also be effected negatively by:

- Media not compatible with the wetted materials.
- Rapid pressure changes in the system, or in case of diaphragm switches >30 cycles/minute, in case of piston switches >60 cylces/minute.
- System cycling pressure exceeding the top of the adjustable range.

The proof pressure must never be exceeded, otherwise the switch may be damaged. Careful selection of the pressure range can have a positive effect on the service life of the switch.