

Pressure Switches



Piston actuated
With soft seal, no leakage
For neutral gaseous and liquid fluids
Working pressure range 3 ... 230 bar

Catalog Register
D5, H19

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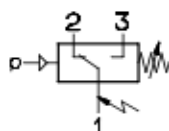
Description (standard unit)

Pressure switch for oil-treated compressed air, hydraulic oil and other fluids with good antifriction properties (state kind of fluid)
 Working viscosity up to 1000 mm²/s

Repeatability: ± 1%
 Switching element: Microswitch
 Degree of protection: Grooved ring: IP 54,
 O-ring: IP 65
 Ambient temperature: 0 to + 80 °C
 Fluid temperature: 0 to + 80 °C
 Max. temperature at switching element: + 80 °C
 Mounting position: With O-ring: Optional
 With grooved ring: Vertical, pressure connection from below
 Max. perm. vibrations: 4 g



Type 7 D



Switching function:
 Microswitch SPDT

Terminals 1 – 3: Contacts close on rising pressure
 Terminals 1 – 2: Contacts open on rising pressure

Features

- No leakage line required
- Precise regulation of pressure changes between switching points
- Pressure peaks and vibrations should be avoided¹⁾
- O-ring-sensor system is less sensitive to vibrations

Parameters Switching pressure difference not adjustable

Adjustable range	Switching pressure difference		Max. allowable pressure ²⁾	Number of switching cycles per minute	Pressure sensor materials			Type of connection	Port size	Total weight	Dimensional drawing	Cat. No.
	lower range	upper range			Housing	Seal	Piston					
	[bar]	[bar]			[bar]	[bar]						
$p_{0.1 \text{ min}} \dots p_{0.1 \text{ max}}$ (VDI 3283)												
[bar]	[bar]	[bar]	[bar]									
3 ... 40	5	9	300	20 max.	Brass 2.0401	Grooved ring NBR (Perbunan)	Tool steel piston 1.2210	Internal thread	G 1/4	0.8	01	0816500
5 ... 63	6	13	300	(no sudden pressure changes or vibrations. If necessary, install surge damper)					G 1/4	0.8	01	0816600
5 ... 100	6	16	300						G 1/4	0.8	01	0816700
5 ... 160	7	19	300						G 1/4	0.8	01	0816800
10 ... 230	10	25	300	30 max. (sudden pressure changes permissible)		O-ring NBR (Perbunan)	St. st. piston 1.4301		G 1/4	0.8	02	0816919

1) In case of vibrations, install damping chamber 0574773.

2) Observe switching pressure range, do not subject switch to max. allowable pressure during normal operation. Even short pressure peaks must not exceed this value. Max. allowable pressure = Max. test pressure.

Parameters Switching pressure difference adjustable

Adjustable range	Switching pressure difference		Max. allowable pressure ²	Number of switching cycles per minute	Pressure sensor materials			Type of connection	Port size	Total weight	Dimensional drawing	Cat. No.
	lower range	upper range			Housing	Seal	Piston					
p _{vu min} ...p _{vo max} (VDI 3283)	[bar]	[bar]	[bar]							[kg]	No.	
3 ... 40	8... 13	25	300	20 max.	Brass 2.0401	Grooved ring NBR (Perbunan)	Tool steel piston 1.2210	Internal thread	G 1/4	0.85	01	0806500
5 ... 63	10...16	40	300	(no sudden pressure changes or vibrations. If necessary, install surge damper)					G 1/4	0.85	01	0806600
5 ... 100	11...16	80	300						G 1/4	0.85	01	0806700
5 ... 160	13...22	120	300						G 1/4	0.85	01	0806800
10 ... 230	14...28	120	300	max. 30 (sudden pressure changes permissible)		O-ring NBR (Perbunan)	St. st. piston 1.4301		G 1/4	0.85	02	0806919

1) In case of vibrations, install damping chamber 0574773.

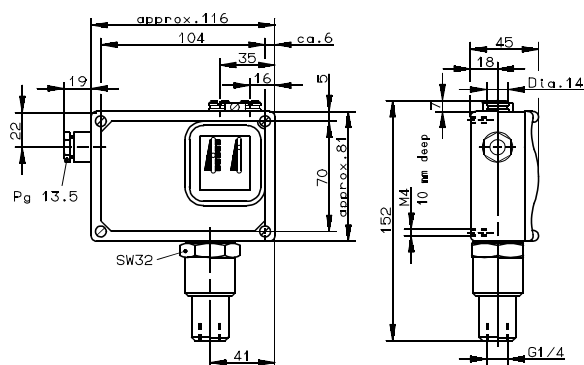
2) Observe switching pressure range, do not subject switch to max. allowable pressure during normal operation. Even short pressure peaks must not exceed this value. Max. allowable pressure = Max. test pressure.

Other versions available on request

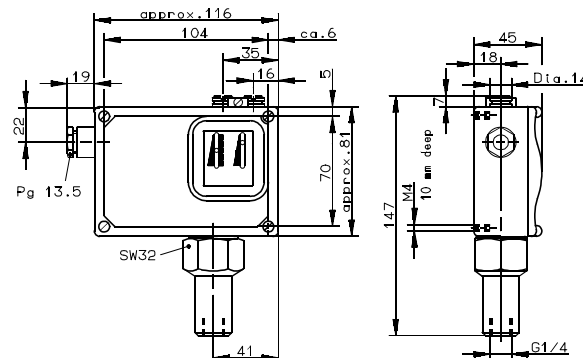
- with smaller switching pressure difference
- Viton (FKM) sealing

Dimensional drawings

01



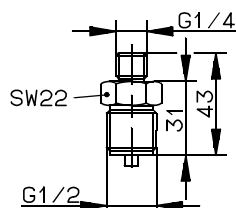
02



Accessories

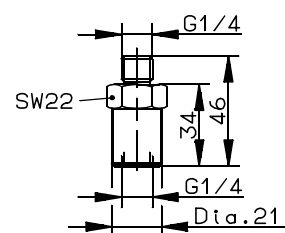
Reducer
G 1/4 to G 1/2
external thread

Cat. No. **0574767**



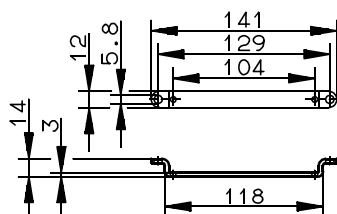
Surge damper
G 1/4

Cat. No. **0574773**



7 D support
(2 bracket and
4 screws)

Cat. No. **0574772**



Switch selection and mounting instructions

The switching points should normally be in about the middle of the adjustable range.

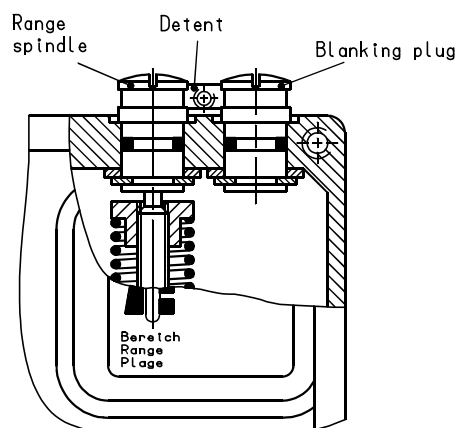
Do not exceed electrical ratings.

Electrical connection by a Pg 13.5 cable gland, in accordance with local regulations. For outdoor installation sufficient protection has to be provided for. Critical conditions are: Aggressiveness of air, high or low temperatures, drastic changes in temperature, solar radiation, penetration, of water. Never twist pressure sensor, hold it tight when connecting the switch. Avoid twisting of pressure sensor by all means. Counterhold when connecting switch.

Special applications and critical fluids for which materials 1.4301 and 1.4401 are unsuitable, require use of diaphragm 0579726 (material PTFE) between connecting flange and flange of pressure switch.

Setting of the switching points

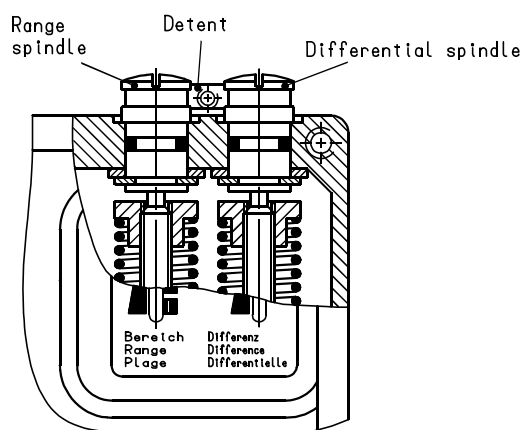
Use range spindle to set the upper or lower switching point on designs with **fixed** switching pressure difference. The opposite one is determined by the fixed switching pressure difference.



On designs with **adjustable** switching pressure difference, use range spindle to set the lower switching point, then use differential spindle to set the upper switching point by adding the desired switching pressure difference. Turning the range spindle anticlockwise shifts both switching points upwards. Turning the differential spindle anticlockwise shifts only the upper switching point upwards, i.e. the switching pressure difference (distance between the upper and lower switching points) increases.

Example:

Desired:	Lower switching point	40 bar
	Upper switching point	60 bar
	Switching temperature difference	20 bar
Setting:	With range spindle	40 bar
	With differential spindle	20 bar



To set precise switching points, a pressure gauge is required. (The temperature switch is a switching and regulating device and not a measuring instrument – even if it has a scale to assist in the setting). The setting can be changed at any time, even during operation.

Making and/or breaking capacity

Microswitch with gold-plated contacts:

V_{\min} and I_{\min} : No lower limit

Recommended upper limit:

V_{\max} appr. 48 V, I_{\max} appr. 20 mA

Operating pressure switch with a voltage >48 VDC and/or a current >20 mA, will damage the gold plating on the contacts of the microswitch. The pressure switch can then only be used for currents exceeding 20 mA.

The switching capacity with the remaining silver contacts is listed in table below:

Type of current	Type of load	Voltage [V]			
		24	60	110	220
		Make and break current [A]			
AC	Resistive load	15	15	15	15
AC	Inductive load, $\cos \varphi \approx 0.7$	4	2.5	1.5	0.9
AC	Inductive load, spark quenching with RC-link	6	4	2.5	1.5
DC	Resistive load	2	0.9	0.45	0.2
DC	Inductive load, $L/R \approx 10$ ms	1	0.3	0.09	0.02
DC	Inductive load, spark quenching with diode	1.5	0.7	0.35	0.15

Reference number of switchings: 60/min

Reference temperature + 30 °C

(with a temperature of + 70 °C, the switching current corresponds to 50% of the tabulated values only).

Contact-life appr. 1×10^6 switching cycles at max. switching current
(at 50% of max. current, contact life is appr. 3 times as long).

Mechanical life appr. 5×10^6 switching cycles.

Creepage and air paths correspond to insulation group B according to VDE Reg. 0110 (except contact clearance of microswitch).

Spark quenching (direct current):

1. Diode in parallel to inductive load
Make sure polarity is correct when making connections.

Dimensioning of quenching diode (rectifier):

Rated voltage of diode $V_D \geq 1.4 \times V_{\text{Term.}}$

Rated current of diode $I_{\text{Rated}} \geq I_{\text{Load}}$

Choose quick switching diode
(recovery $t_{\text{rr}} \leq 200$ ns)

2. RC-link in parallel to load (or in parallel to switching contact).
Suited for direct and alternating current.

Ratings:

$R [\Omega] \approx 0.2 \times R_{\text{Load}} [\Omega]$

$C [\mu\text{F}] \approx I_{\text{Load}} [\text{A}]$

