Pressure Switches

Plastic diaphragm-actuated
For neutral gaseous and liquid fluids
Working pressure range 0 ... 25 bar

OBSOLETE DOCUMENT
Technical Reference Only

Catalog Register
A 19, P 19, D 4
Schrift 750**0611**.06.11.97

Description (standard unit)

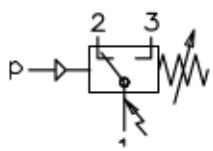
Pressure switch for air, gas water, hydraulic oil, lubricants, light fuel oil
Max. viscosity 1000 mm²/s

Repeatability:	± 1%
Switching element:	Microswitch
Degree of protection:	IP 65
Ambient temperature:	0 to + 60 °C
Fluid temperature:	0 to + 80 °C
Temperature at switching element:	max. + 80 °C
Mounting position:	beliebig
Vibrations:	4 g max. (sinusoidal)[1]

Type 7 D

Features

- Sensitive control
- Long life
- DVGW-approved



Switching function:
Microswitch SPDT
Terminals 1 – 3: Contacts close on rising pressure
Terminals 1 – 2: Contacts open on rising pressure

Parameters Switching pressure difference fixed

Adjustable range[5] $p_{u\,min}$...$p_{u\,max}$ (VDI 3283) [bar]	Switching pressure difference Lower range [bar]	Upper range [bar]	Max. allowable pressure[2] [bar]	Switching cycles per minute	Pressure sensor materials Housing	Seal	Connection (internal thread)	Weight [kg]	Dimensional drawing No.	Cat. No.	DIN-DVGW-Register-No.
0 ... 0.025	0.003	0.004	0.5	10 max. (no sudden pressure changes)	Galvanized steel 1.0333	NBR (Perbunan)	G 1/4	1.0	01	**0812200**	84.05 f 158
0 ... 0.06	0.004	0.006	0.5				G 1/4	1.0	01	**0812500**[3]	84.06 f 158
0 ... 0.16	0.004	0.008	0.5				G 1/4	1.0	01	**0812700**	84.07 f 158
0 ... 0.25	0.004	0.009	0.5				G 1/4	1.0	01	**0812800**[3]	84.08 f 158
0.05 ... 0.6	0.03	0.06	15	40 max. (sudden pressure changes and overpressure permissible)	Brass 2.0401		G 1/4	1.15	0.2	**0814100**[4]	–
0.05 ... 1.0	0.03	0.09	15				G 1/4	1.15	0.2	**0814200**[4]	–
0.05 ... 1.6	0.03	0.12	15				G 1/4	1.15	0.2	**0814300**[4]	–
0.05 ... 2.5	0.04	0.15	15				G 1/4	1.15	0.2	**0814400**[4]	–
0.3 ... 4	0.2	0.4	40				G 1/4	0.85	0.3	**0814500**[4]	–
0.3 ... 6	0.3	0.5	40				G 1/4	0.85	0.3	**0814600**[4]	–
0.5 ... 10	0.3	0.6	40				G 1/4	0.85	0.3	**0814700**[4]	–
1 ... 16	0.4	1.2	50				G 1/4	0.85	0.3	**0814800**[4]	–
1 ... 25	0.4	1.5	50				G 1/4	0.85	0.3	**0814900**[4]	–

[1] Tested in accordance with DIN 89011, 5.2., within the frequency range 25...100 Hz; within the frequency range 2...25 Hz, tested with amplitude 1.6 mm.
[2] Operational exploitation of maximum value is not allowed. Even short pressure peaks during operation must not exceed this maximum value. Maximum value = Test pressure.
[3] With screwed cable joint for marine engineering (M 18 x 1,5 oder M 24 x 1,5 DIN 89280). Approved by PRS Polski Rejestr Statkow, USSR Register of Shipping.
[4] With screwed cable joint for marine engineering (M18 x 1,5 or M 24 x 1,5 DIN 89280). Approved by GL Germanischer Lloyd, LR Lloyd's Register of Shipping, PRS Polski Rejestr Statkow, USSR Register of Shipping.
[5] Reference pressure is the atmospheric pressure.

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Parameters Switching pressure difference adjustable

Adjustable range	Switching pressure difference		Max. allow-able pres sure2)	Switching cycles per minute	Pressure sensor materials		Connec-tion (internal thread)	Weight	Dimen-sional drawing	Cat. No.	DIN-DVGW-Register-No.
					Housing	Seal					
$p_{vu\ min}$...$p_{vo\ max}$ (VDI 3283)	Lower range[1)]	Upper range									
[bar]	[bar]	[bar]	[bar]					[kg]	No.		
0 ... 0.025	0.008...0.011	0.025	0.5	10 max. (no sudden pressure changes)	Galva-nized steel 1.0333	NBR (Per-bunan)	G 1/4	1.05	01	**0802200**	84.01 f 158
0 ... 0.06	0.009...0.015	0.04	0.5				G 1/4	1.05	01	**0802500**[3)]	84.02 f 158
0 ... 0.16	0.011...0.023	0.12	0.5				G 1/4	1.05	01	**0802700**	84.03 f 158
0 ... 0.25	0.011...0.028	0.2	0.5				G 1/4	1.05	01	**0802800**[3)]	84.04 f 158
0.05 ... 0.6	0.09...0.16	0.5	15	40 max. (sudden pressure changes and over pressure permissible)	Brass 2.0401		G 1/4	1.20	02	**0804100**[4)]	-
0.05 ... 1.0	0.11...0.18	0.8	15				G 1/4	1.20	02	**0804200**[4)]	-
0.05 ... 1.6	0.13...0.25	1.2	15				G 1/4	1.20	02	**0804300**[4)]	-
0.05 ... 2.5	0.14...0.25	2.0	15				G 1/4	1.20	02	**0804400**[4)]	-
0.3 ... 4	0.5...0.8	2.0	40				G 1/4	0.9	03	**0804500**[4)]	-
0.3 ... 6	0.6...1.0	4.0	40				G 1/4	0.9	03	**0804600**[4)]	-
0.5 ... 10	0.6...1.1	6.0	40				G 1/4	0.9	03	**0804700**[4)]	-
1 ... 16	1.2...2.5	12.0	50				G 1/4	0.9	03	**0804800**[4)]	-
1 ... 25	1.2...3.3	20.0	50				G 1/4	0.9	03	**0804900**[4)]	-

[1)] Values listed are maximun values. The smaller ones refer to the beginning, the greater ones to the end of the switching pressure range.

[2)] Operational exploitation of maximum value is not allowed. Even short pressure peaks during operation must not exceed this maximum value. Maximum value = Test pressure.

[3)] With screwed cable joint for marine engineering (M 18 x 1,5 oder M 24 x 1,5 DIN 89280.) Approved by PRS Polski Rejestr Statkow, USSR Register of Shipping.

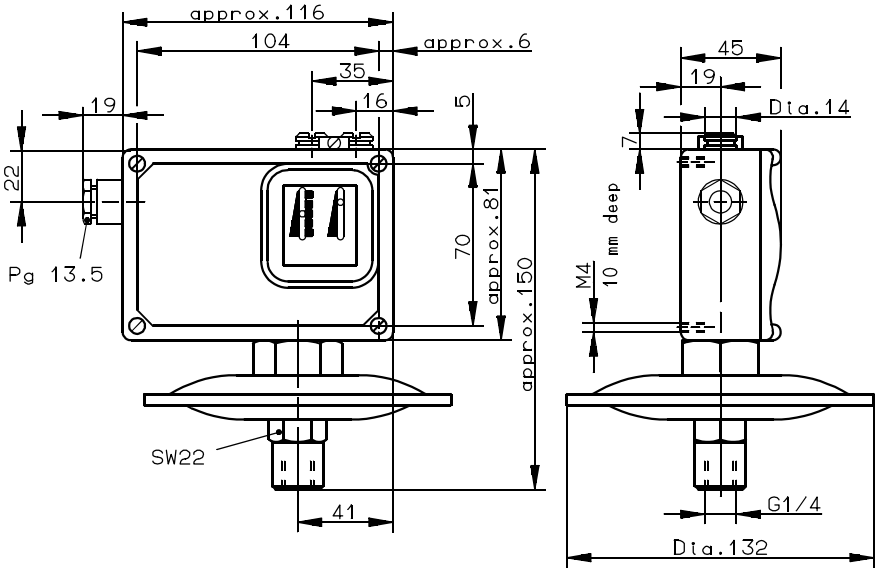
[4)] With screwed cable joint for marine engineering (M18 x 1,5 or M 24 x 1,5 DIN 89280). Approved by GL Germanischer Lloyd, LR Lloyd's Register of Shipping, PRS Polski Rejestr Statkow, USSR Register of Shipping.

Other versions available on request

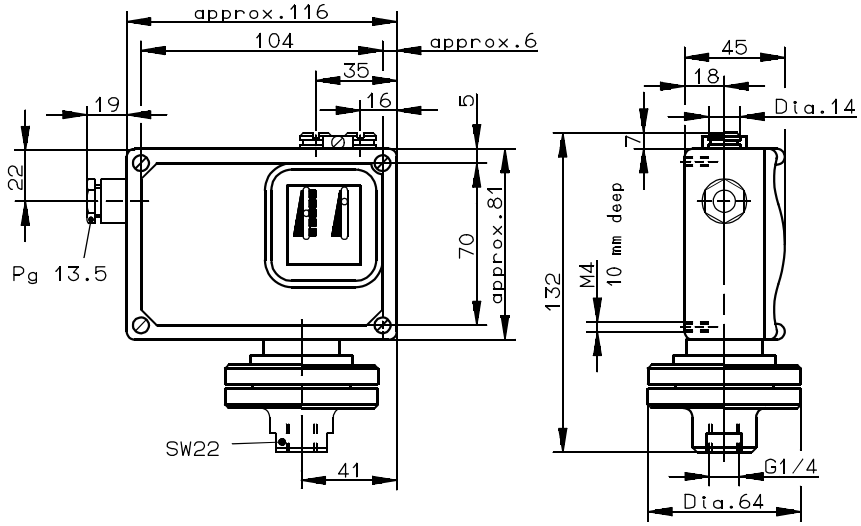
- Approved by shipping authorities
- In protection class (Ex)d 3n G5
- Weatherproof design
- With plug-in type electrical connection
- Microswitch with gold-plated contacts

Dimensional drawings (mm)

01



02



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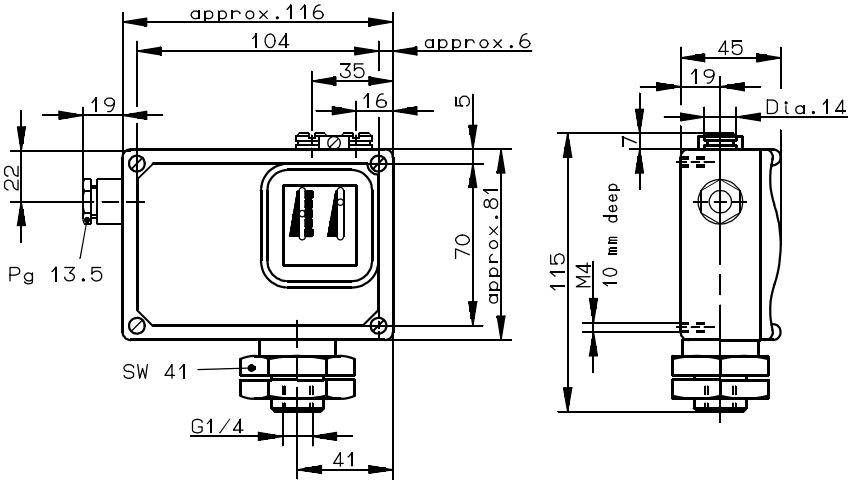
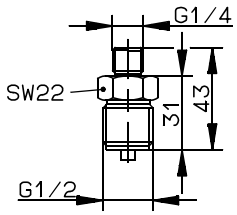


Accessries

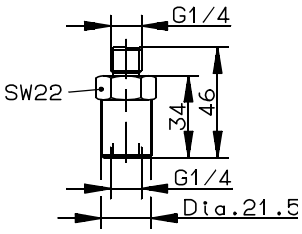
Reducer
G 1/4 to G 1/2
External thread

Cat. No**. 0574767**



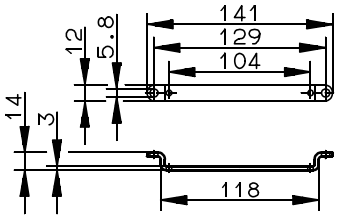
Surge damper
G 1/4

Cat. No. **0574773**



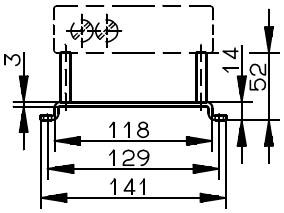
7 D mounting
support
(2 brackets and
4 screws)

Cat. No. **0574772**



7 D mounting support
(2 brackets, 4 screws
and 4 threaded unions).
Only for low pressure
switches
0802200 to 0802800 and
0812200 to 0812800

Cat. No. **0574771**

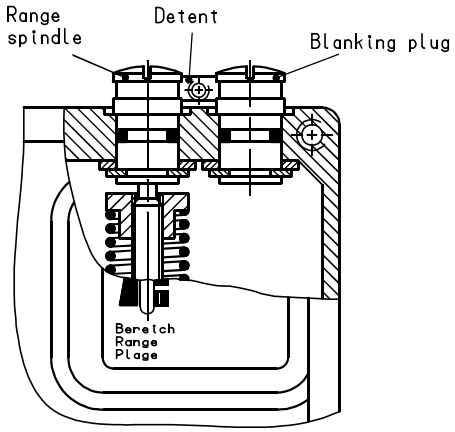


Switch selection and instructions

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, switches have to be sufficiently protected against critical conditions like aggressive atmosphere, high and low temperatures, drastic changes in temperatures, solar radiation, penetration, of water.
Avoid twisting of pressure sensor, hold it tight when conecting switch.

Setting of the switching points

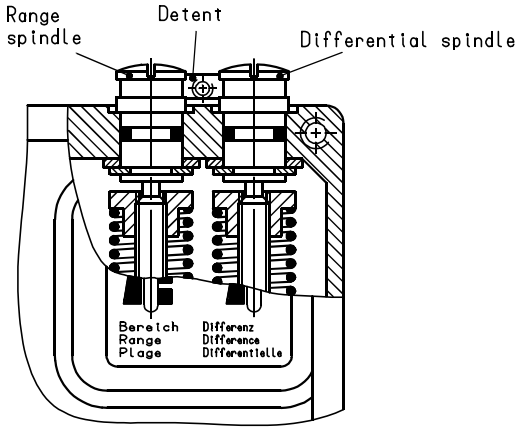
Use range spindle to set the upper or lower switching point on design with **fixed** switching pressure difference. The opposite one is determined by the fixed switching pressure difference.



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 antilockwise shifts both switching points upwards. Turning the differential spindle antilockwise shifts only the upper switching point uppwards, i.e. the switching pressure difference (distance between the upper and lower switching points) increases.

Example:

Desired:	Lower switching point	6 bar
	Upper switching point	8 bar
	Switching pressure difference	2 bar
Setting:	Range spindle	6 bar
	Differential spindle	2 bar



To set precise switching points, a pressure gauge is required. (The pressure 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.
Range- and differential spindle are provided with a releasable detent. If desired, switch can also be lead-sealed.

Making and/or breaking capacity

Change-over switch with silver spring contacts

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 φ ≈ 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 ≈ 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 reference temperature of + 70 °C, I_{max} corresponds to 50% of the tabulated values only).

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

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

For non-aggressive atmosphere, which in particular does not contain any sulphur, the following limits are valid:

Microswitch with standard silver contacts:
$\mathbf{U}_{min}$ appr. 8 ... 12 V, I_{min} appr. 10 mA,
Maximum values acc. to table above

Microswitch with gold-plated contacts:
V_{min} and I_{min}: No lower limit
Sensible upper limit:
V_{max} appr. 48 V, I_{max} appr. 20 mA;
(for higher values silver spring contacts are completely sufficient).

Creepage-and air paths correspond to insulation group B according to VDE Reg. 0110 (except contact clearence 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:
   Rated voltage of diode $V_D \geq 1.4 \times V_{Term.}$

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

   Choose quick switching diode
   (recovery trr ≤ 200 ns).

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

   Ratings:
   R [Ω] ≈ 0.2 x R_{Load} [Ω]
   C [µF] ≈ I_{Load} [A]