Electronic pressure switches type DG 6

With two PNP-signal outputs
4-pin socket M12

Operation pressure: p_{max} = 400 bar

See also:

Pressure switches type DG	D 5440
Electronic pressure switches type DG 5 E	D 5440 E/1
- analogous pressure transducer type DT 1	D 5440 T
- analogous pressure transducer type DT 2	D 5440 T/1

1. General

1.1 Application

The electronic pressure switches type DG 6 widen the product range, complementing the electronic pressure switch type DG 5 E.. (acc. to D 5440 E) and the well approved piston type pressure switch type DG 3 (acc. to D 5440).
They are intended for high-end applications with a corresponding price/performance ration where e.g. two switch points, adjustable hysteresis, high switch operation accuracy, repeatability, acceleration resistance, and switching cycles are a must.

1.2 Brief description

These electronic pressure switches type DG 62 und DG 64 apply wire strain gauges with full bridge circuitry. The sensor elements are welded onto a stainless diaphragm, produced in a thick-film technology (silk-screen printing) and temperature compensated due to their design.
The adaptation and evaluation of the signal output is via analogous electronics.

The most essential qualities:

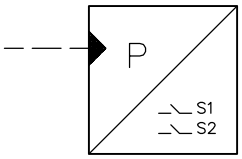
- Two signal PNP-outlets (switching plus) overload resistant and short-circuit proof
- Hydraulic connection: G 1/4 (BSPP) with elastic seal conf. DIN 3852-E
- bar and psi scaling on the adjustment rings
- Easy, straight forward operation
- Very high mechanical and electrical service life
- Rugged industrial design
- High IP protection class (IP 67 (IEC 60529))
- Provision for a lead seal at the protection cap (scope of delivery)

There are two versions available:

DG 6.

- Two signal PNP-outputs indiv. adjustable
- Two LED‘s (yellow) as switching status indicators
- Constant hysteresis

Symbol

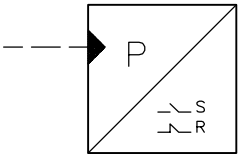


Detailed symbol see page 2

DG 6. R

- Two antivalent signal outputs (both switch points are not independent)
- 1x visual indication of the switching state (yellow LED) 1x visual indication of the supply voltage (green LED)
- Individually adjustable switch pressure for On and OFF (adjustable hysteresis)

Symbol



The most essential functional parts:

- The pressure sensor, wire strain gauge welded onto stainless with thick-film technology (capacitive principle)
- Two LED‘s (yellow)
- Two fully-electronic PNP-outlets (switching plus)
- Electrical connection by means of M12 socket
- Housing: Stainless / plastic, adjustment via 2 rings with scales
- Hydraulic connection: G 1/4 (BSPP) with elastic seal conf. DIN 3852-E
- Hydraulic connection: Tapped port G 1/4 (BSPP)
- Translucent protection cap (scope of delivery)

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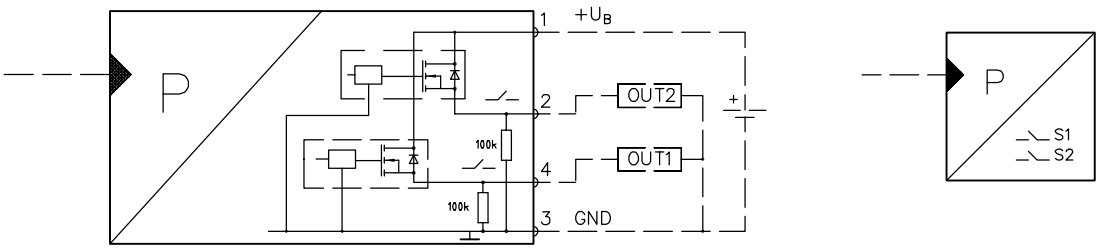
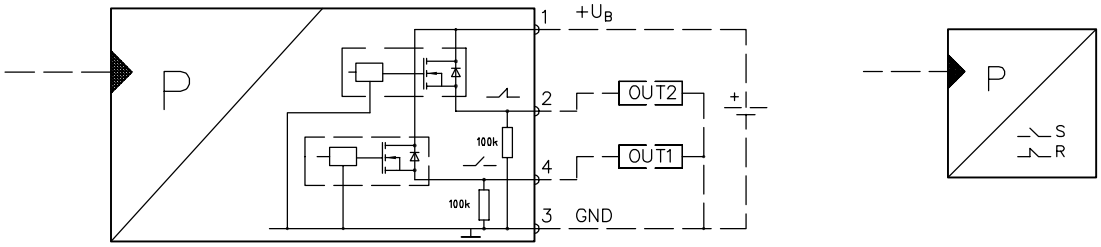
February 2012-02

Circuitry **Symbol**

DG 6.



DG 6. R



2. Available versions

2.1 Type coding key, accessories

2.1.1 Pressure switch

Order coding:

Type	Part No.	Pressure range	Note
DG 61	6217 8174-00	0 ... 100 bar	two independent signal outputs
DG 61 M	6217 8181-00	0 ... 10 MPA	
DG 62	6217 8124-00	0 ... 250 bar	
DG 62 M	6217 8175-00	0 ... 25 MPA	
DG 64	6217 8125-00	0 ... 400 bar	
DG 64 M	6217 8180-00	0 ... 40 MPA	
DG 61 R	6217 8133-00	0 ... 100 bar	individually adjustable switch pressure for On and OFF
DG 61 RM	6217 8182-00	0 ... 10 MPA	
DG 62 R	6217 8131-00	0 ... 250 bar	
DG 62 RM	6217 8176-00	0 ... 25 MPA	
DG 64 R	6217 8132-00	0 ... 400 bar	
DG 64 RM	6217 8183-00	0 ... 40 MPA	

2.1.2 Assembly accessories

Translucent protecting cap (scope of delivery) made of plastic (PA), provision for a lead seal

Order coding M12-plug, 4-pin, angled:	**MSD-T7**	6217 8048-00
Order coding: Straight male stud fitting with taper G 1/4 (BSPP-internal), -G 1/4 (BSPP-external) for installation in arbitrary direction (turned around the longitudunal axis), acc. to D 7077	**X84G**	6900 1032-00
Order coding: flange type adaptor (with hole pattern like for type DG 3.. acc. to D 5440)	**Y 9**	6800 6832-07

2.2 Technical data

2.2.1 General data

Nomenclature	Electronic pressure switch
Pressure connection	G 1/4 A (BSPP), male with cavety conf. DIN 3852 E with elastic seal
Materials in contact with the pressure fluid	V2A (1.4404), NBR
Housing materials	V4A (1.4404), PBT (Pocan), PC (Macrolon), NBR, protective cap PA (polyamide)
Electrical connection	Via plug M12, 4-pin (industrial standard). Available from HAWE as option, see sect. 2.1.2
Installed position	Any (dep. readability)
Mass (weight)	approx. 80 g
Shock resistance	50 g, 11 ms acc. to IEC 68-2-27
Vibration resistance	20 g, 10-2000 Hz acc. to IEC 68-2-6
Protection class or IEC 60529	IP 67 in properly installed state
Protection class	III. nach EN 50178
Ambient temperature	-25° ... + 80°C
Fluid temperature	-25° ... + 80°C
Electro-magnetic compatibility (EMC)	Interference immunity acc. to EN 61000-4-2 ESD 4/8 kV EN 61000-4-3 HF radiated 10 V/m EN 61000-4-4 Burst 2 kV EN 61000-4-6 HF wire bound 10 V acc. to EC-directive 89/336/EWG

with UL- approval (UL-Listing Mark) c UL us IND.CONT.EQ LISTED 11 MA

For the scope of validity c UL us:
The device shall be supplied from an isolating transformer having a secondary Listed fuse rated either
a) max 5 amps for voltages 0~20 Vrms (0~28.3 Vp) or
b) 100/Vp for voltages of 20~30 Vrms (28.3~42.4 Vp).

The Sensor shall be connected only by using any R/C (CYJV2) cord, having suitable ratings.

2.2.2 Hydraulic parameters

		DG 61 DG 61 M	DG 62 DG 62 M	DG 64 DG 64 M	DG 61 R DG 61 RM	DG 62 R DG 62 RM	DG 64 R DG 64 RM
Measuring range	[bar]	0 ... 100	0 ... 250	0 ... 400	0 ... 100	0 ... 250	0 ... 400
	[PSI]	0 ... 1450	0 … 3625	0 .. 5800	0 ... 1450	0 ... 3625	0 ... 5800
	[MPA]	0 ... 10	0 ... 25	0 ... 40	0 ... 10	0 ... 25	0 ... 40
Perm. pressure overload p_{max}	[bar]	200	400	600	200400	600	
	[PSI]	2900	5800	8700	2900	5800	8700
	[MPA]	20	40	60 20	40 60		
Burst pressure p_{burstt}	[bar]	1000	1000	1600	1000	1000	1600
	[PSI]	14500	14500	23200	14500	14500	23200
	[MPA]	100	100	160	100100	160	
Adjustment range:		Set 1, Set 2	Set 1, Set 2	Set 1, Set 2	Set Set	Set	
Switch point, SP	[bar]	5 ... 100	7.5 ... 250	12 ...400	5 ... 100	14 ... 250	20 ... 400
	[PSI]	72 ... 1450	109 ... 3625	174 ... 5800	72 ... 1450	203 ... 3625	290 ... 5800
	[MPA]	0.5 ... 10	0.75 ... 25	1.2 ... 40	0.5 ... 10	1.4 ... 25	2 ... 40
		Hysterese	Hysterese	Hysterese	Reset	Reset	Reset
Switching hysteresis/	[bar]	2.0	5.0	8.03 ... 98	8 ... 244	12 ... 392	
Set back point	[PSI]	29	72	116	44 ... 1421	116 ... 3539	175 ... 5685
	[MPA]	0.2	0.5	0.8	0.3 ...9.8	0.8 ... 24.4	1.2 ...39.2

Note:
The evaluation system can be damaged in the range between p_{max} and p_{burst} but the device will not show external leakage.

2.2.3 Electrical parameters

Supply voltage U_B	9.6 ... 32 V DC (protected against wrong polarity and overload up to 40 V DC)
Idle current consumption I_L	max. 25 mA (internal consumption)
Max. perm. ripple factor	10% (ripple)
Outputs (Short-circuit proof and overload resistant):	
Max. current I_A	max. 2x250 mA
Voltage drop ΔU_A	max. 2 V DC
Max. switching frequency	100 Hz
Visual function displays:	
Switching states and/or	2 x yellow LED´s
Supply voltage	
Precision:	
Switch point accuracy	±2.5% of the value of measuring range
Repeatability	±0.5% of the value of measuring range
Temperature drift	±0.5% of the value of measuring range / 10K
in the compensated range	0 ... 80°C (TK)
Switching cycles	N > 50 million
Switch point setting	Via rings (may be locked)
Insulation resistance 500 V DC	> 100 MΩ
Hysteresis	2% of the value of measuring range

Note: The scale graduation is only a rough guidline for the switch points.
Always use a pressure gauge for accurate adjustment.

2.2.4 Electro-magnetic compatibility (EMC)

The EMC of the device was checked by an accredited approval institute (Interference immunity acc. to EN 61000-4-X). This EMC test doesn‘t relieve the user from the proper execution of a specified EMC test for his complete system, since these test assemblies represent only a typical application (conforming the EC-guideline 89/336/EWG).

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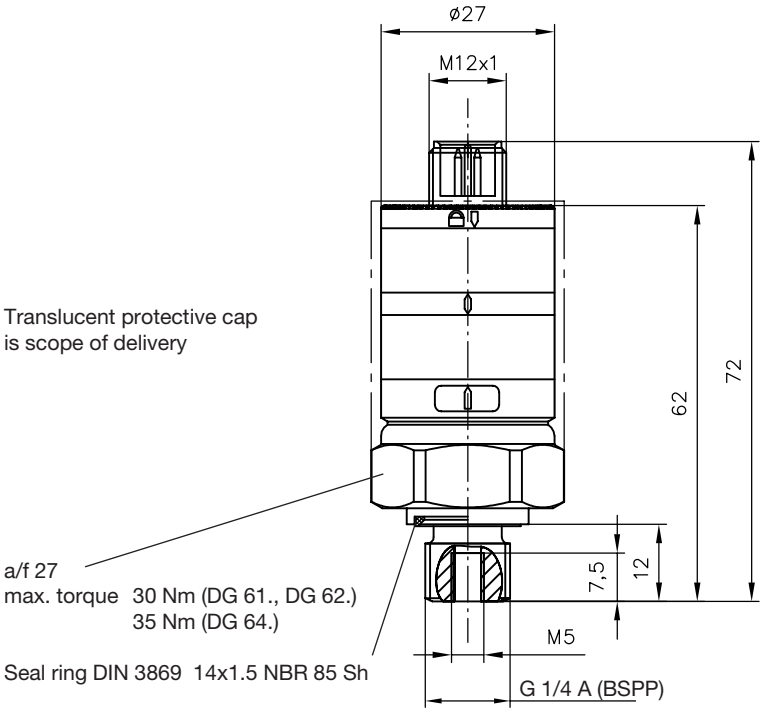
3. Unit dimensions

All dimensions in mm, subject to change without notice!

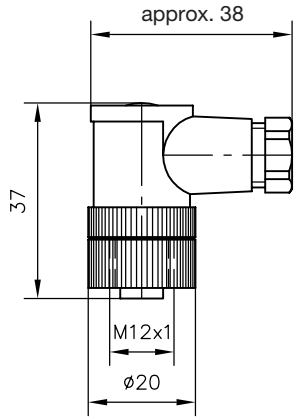
3.1 Electronic pressure switch



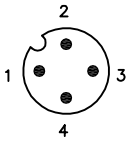
3.2 Assembly accessories

MSD-T7 M12

Plug

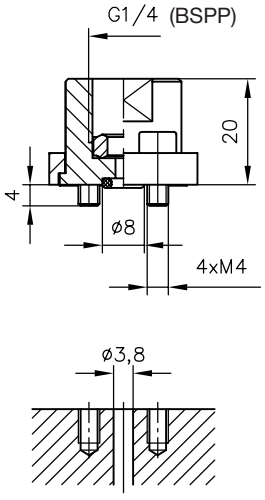


Terminals



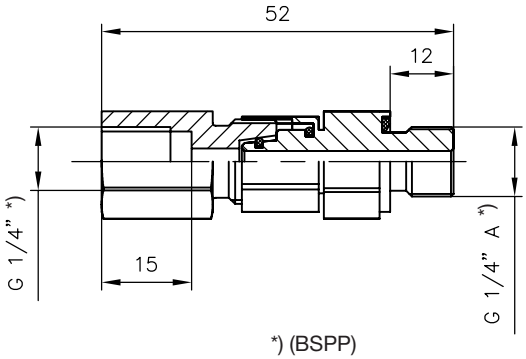
Y 9

Flange adapter

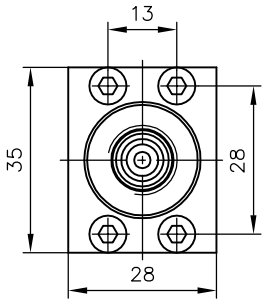


X84G

Straight male stud fitting G 1/4 (BSPP)



*) (BSPP)



4. Assembly and adjustment manual

4.1 Assembly

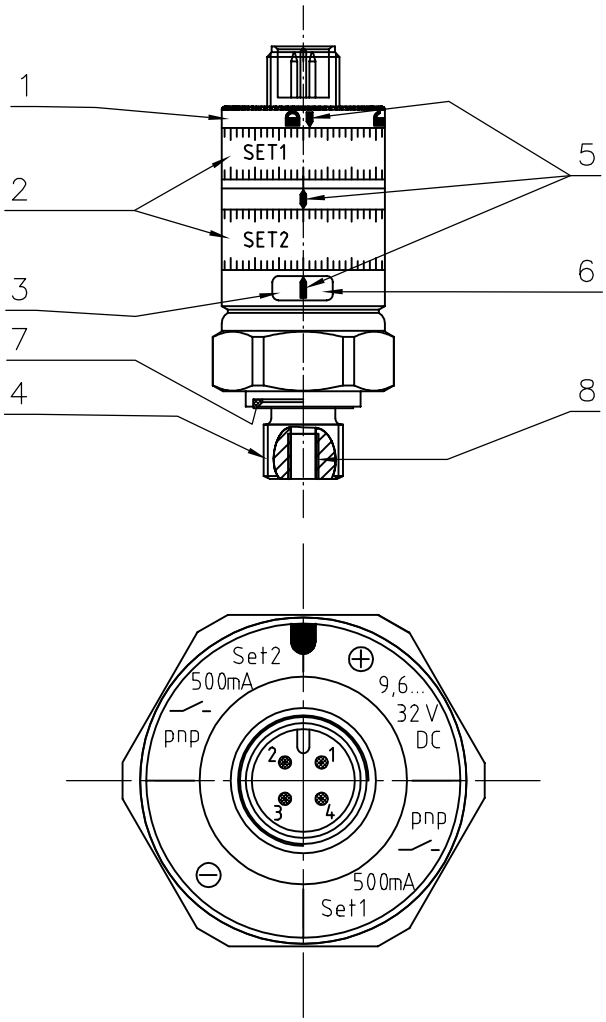
Mount the electronic pressure switch at a suitable test port (see assembly accessories, sect. 3.2).
Max. torque 25 Nm
Switch your system in unstressed mode and electrically connect the equipment via plug M12 (see assembly accessories in sect. 2.1.2). Please take into account, that no assembly accessory is scope of delivery with the pressure switch, therefore it must be ordered separately when required
The protecting cap (scope of delivery) protects the adjustment rings against paint, dust etc. It also gives provision for a lead seal preventing unauthorized adjustment after the final setting procedure.

Attention: Excessive pressure or pressure surges have to be prevented as they may harm the device.
Pls. contact our service staff to prevent such effects.

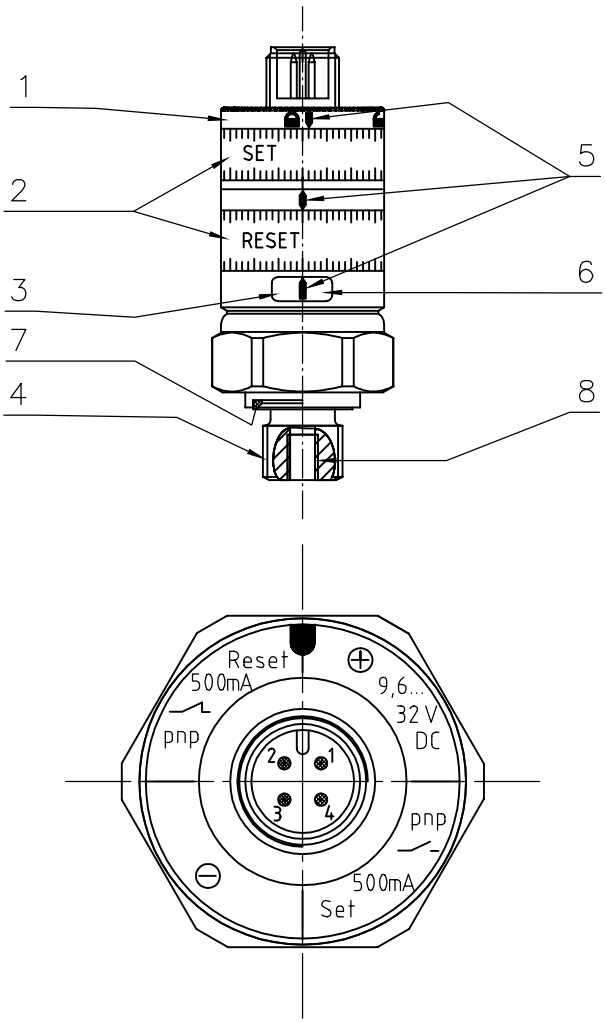
4.2 Adjustment

Operating devices

DG 6.



DG 6. R



SET1 = Signal output NO-contact PIN 4
SET2 = Signal output NO-contact PIN 2

Procedure DG 6.

a. Loosen the lock-ring (1)
Both adjustment rings (2)
may be set manually after loosening the lock-ring.

b. Adjust both adjustment rings (2) to the desired pressure.
The scaling index (5) is printed onto the housing.

c. Tighten the lock-ring (1)
to fix the setting of both adjustment rings (2).

d. LED-yellow (3) is ON, when SET1 is achieved.

e. LED-yellow (6) is ON, when SET2 is achieved.

f. The elastic seal ring (7) acc. to DIN 3869
14x1.5 FKM may be replaced when necessary.

g. Install the protective cap (a lead seal may be applied).

SET = Signal output NO-contact PIN 4
RESET = Signal output NC-contact PIN 2

Procedure DG 6.R

a. Loosen the lock-ring (1)
Both adjustment rings (2)
may be set manually after loosening the lock-ring.

b. Adjust both adjustment rings (2) to the desired pressure.
The scaling index (5) is printed onto the housing.

c. Tighten the lock-ring (1)
to fix the setting of both adjustment rings (2).

d. LED-green (3) is ON, when supply voltage available

e. LED-yellow (6) is ON, when SET is achieved
and is OFF, when pressure falls below RESET-value.

f. The elastic seal ring (7) acc. to DIN 3869
14x1.5 FKM may be replaced when necessary.

g. Install the protective cap (a lead seal may be applied).