

Electronic pressure switch type DG 6

Product documentation



2 switch outputs, independent switching point setting

Operating pressure p_{\max} : 400 bar



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Contents

1	Overview of electronic pressure switch type DG 6.....	4
1.1	Brief description.....	5
2	Available versions, main data.....	7
2.1	Order coding, accessories.....	7
2.1.1	Pressure switch.....	8
2.1.2	Assembly accessories.....	8
3	Technical data.....	9
3.1	General parameters.....	9
3.2	Hydraulic parameters.....	10
3.3	Electrical parameters.....	11
3.4	Electromagnetic compatibility (EMC).....	11
4	Dimensions.....	12
4.1	Electronic pressure switch.....	12
4.2	Assembly accessories.....	13
5	Assembly, operation and maintenance recommendations.....	14
5.1	Intended use.....	14
5.2	Assembly information.....	14
5.2.1	Assembly and setting instructions.....	14
5.2.2	Setting.....	15
5.3	Operating instructions.....	16
5.4	Maintenance information.....	16

1**Overview of electronic pressure switch type DG 6**

Pressure switches are a hydraulic accessory. They close or open electrical contacts when pressure is applied to them. The pressure switches are used to issue an electronic switching command or signal for subsequent work steps when the pressure reaches a set level. The DG 6 pressure switch can be used to set two independent switching points. The switching points are set using two setting rings that are optimized for easy reading.

Features and benefits:

- Two switch outputs, normally open or normally closed
- System pressure measured continuously
- Optical switching point monitoring by LED
- Independent switching point setting

Intended applications:

- Mobile hydraulics
- Industrial hydraulics



Electronic pressure switch type DG 6

1.1 Brief description

The electronic pressure switches type DG 6 operate according to the principle of strain gauges, which are connected in a full bridge. The sensor elements are applied on a welded stainless steel diaphragm, are produced using thick-film technology (screen-printing process) and are temperature-compensated. The measuring signal is adjusted and evaluated by analogue electronics.

The most important features:

- Both outputs (PNP positive switching) are overload protected and short-circuit-proof
- Process connection 1/4" external thread with elastomer seal according to DIN 3852-1
- Scale on the adjustment rings in bar and PSI
- Easy and clear operation
- Very high mechanical and electrical lifetime
- Robust industrial version
- High protection class (IP 67 (IEC 60529))

Available in two versions:

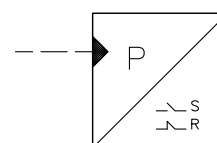
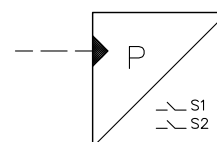
DG 6.

- Two switch outputs that can be set independently
- Optical display of the switching states (2x yellow LEDs)
- Constant hysteresis

DG 6. R

- Two antivalent switch outputs
(the two switching points are not independent)
- 1x optical display of the switching state (yellow LED)
1x optical display of the supply voltage (green LED)
- Switch-on and switch-off pressure can be set separately (adjustable hysteresis)

Symbol

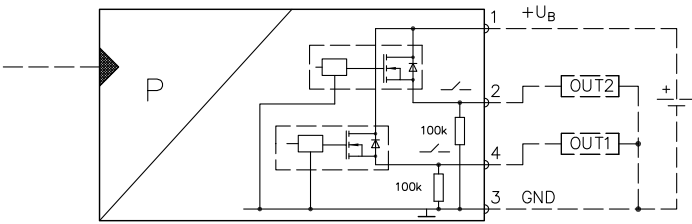


The most important function components are:

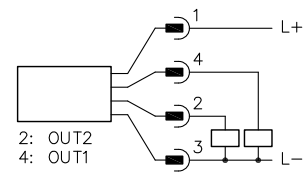
- A strain gauge full bridge on a steel diaphragm produced using thick-film technology as a pressure measuring cell
- Two LEDs
- Two fully electronic MOSFET switch outputs (PNP positive switching)
- Electrical connection using M12x1 plug connection
- Plastic, stainless steel housing with two scaled adjustment rings for setting the switching points
- G 1/4 (BSPP) external thread as pressure-side connection
- Transparent plastic cap included in the delivery

Connection diagram

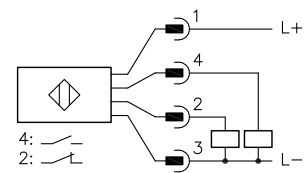
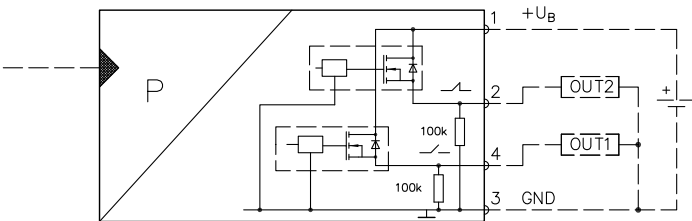
DG 6.



Electrical connection



DG 6. R



M12x1 plug connection



2 Available versions, main data

2.1 Order coding, accessories

Order coding example:

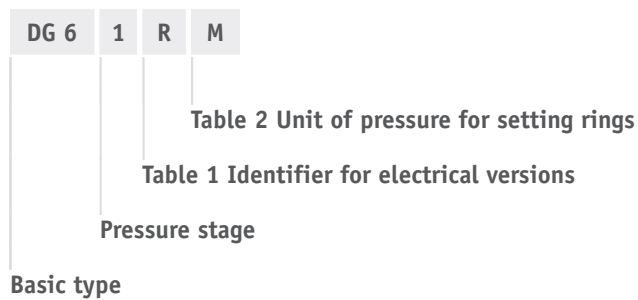


Table 1 Identifiers for electrical versions

Identifier	Description
No designation	2x yellow LEDs for 2 independent switch outputs
R	Yellow LED for switch outputs Green LED for supply voltage

Table 2 Unit of pressure for setting rings

Identifier	Unit of pressure
No designation	Bar and PSI
M	Bar and MPa

2.1.1 Pressure switch

Order coding:

Type	Part no.	Pressure range	Comment
DG 61	6217 8174-00	0 to 100 bar	Two independent switch outputs
DG 62	6217 8124-00	0 to 250 bar	
DG 62 M	6217 8175-00	0 to 25 MPA	
DG 64	6217 8125-00	0 to 400 bar	
DG 61 R	6217 8133-00	0 to 100 bar	Switch-on and switch-off pressure can be set separately
DG 61 RM	6217 8182-00	0 to 10 MPA	
DG 62 R	6217 8131-00	0 to 250 bar	
DG 62 RM	6217 8176-00	0 to 25 MPA	
DG 64 R	6217 8132-00	0 to 400 bar	

2.1.2 Assembly accessories

A transparent plastic protective cover made of PP is included in the delivery.

Order coding:

Coding	Description	Part no.
MSD-T7	M12 line connector, 4-pin, angled	6217 8048-00
X84G	Straight screw-in connectors with G 1/4" (BSPP) internal thread, G 1/4" (BSPP) external thread For installation in any position around the longitudinal axis of the pressure switch (according to D 7077)	6900 1032-00
Y 9	Flange adapter (with hole pattern DG 3.. according to D 5440)	6800 6832-07

3 Technical data

3.1 General parameters

Designation	Electronic pressure switch
Pressure connection	G 1/4 A with mounting hole in accordance with DIN 3852-1, with NBR seal
Materials in contact with hydraulic fluid	V2A (1.4404), NBR
Housing material	V4A (1.4404), PBT (Pocan), PC (Makrolon), NBR, plastic cap PP
Electrical connection	Using M12 line connector, 4-pin (industry standard) Order additionally if required, see Chapter 2.1.2, "Assembly accessories"
Installation position	Any (ensure it can be read)
Weight	approx. 80 g
Shock resistance	50 g, 11 ms according to IEC 68-2-27
Vibration resistance	20 g, 10-2000 Hz according to IEC 68-2-6
Protection class EN 60529	IP 67 in installed condition
Protection class	III. according to EN 50178
Ambient temperature	-25° to +80°C
Medium temperature	-25° to +80°C
Cleanliness level	ISO 4406 <hr/> 21/18/15...19/17/13
Electromagnetic compatibility (EMC)	Emitted interference according to EN 61000-4-2 ESD 4/8 kV EN 61000-4-3 HF emitted 10 V/m EN 61000-4-4 Burst 2 kV EN 61000-4-6 HF conducted 10 V according to EC Directive 89/336/EEC

UL approval ("UL Listed" mark) present



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For the scope of application of c^u_L us:

The device needs to be supplied by a galvanically isolated source, which has a UL-approved fuse as a secondary system with a max. nominal current of either

- a) 5 A at voltage of 0 to 20 Vrms (0 to 28 Vp) or
- b) 100/Vp at voltages of 20 to 30 Vrms (28.3 to 42.4 Vp).

To connect the device, use an R/C (CYJV2) cable with suitable properties.

3.2 Hydraulic parameters

Measuring range		DG 61	DG 62 DG 62 M	DG 64	DG 61 R DG 61 RM	DG 62 R DG 62 RM	DG 64 R
	(bar)	0 to 100	0 to 250	0 ... 400	0 – 100	0 to 250	0 ... 400
(PSI)	0 to 1450	0 to 3625	0 to 5800	0 to 1450	0 to 3625	0 to 5800	
(MPa)	0 to 10	0 to 25	0 to 40	0 to 10	0 to 25	0 to 40	
Permissible overload pressure p_{max}	(bar)	200	400	600	200	400	600
	(PSI)	2900	5800	8700	2900	5800	8700
	(MPa)	20	40	60	20	40	60
Bursting pressure p_{burst}	(bar)	1000	1000	1600	1000	1000	1600
	(PSI)	14500	14500	23200	14500	14500	23200
	(MPa)	100	100	160	100	100	160
Adjustment areas							
Switching point		Set 1, set 2	Set 1, set 2	Set 1, set 2	Set	Set	Set
	(bar)	5 to 100	7.5 to 250	12 to 400	5 – 100	14 to 250	20 to 400
	(PSI)	72 to 1450	109 to 3625	174 to 5800	72 to 1450	203 to 3625	290 to 5800
	(MPa)	0.5 to 10	0.75 to 25	1.2 to 40	0.5 to 10	1.4 to 25	2 to 40
Switching hysteresis / reset point		Hysteresis	Hysteresis	Hysteresis	Reset	Reset	Reset
	(bar)	2.0	5.0	8.0	3 – 98	8 to 244	12 to 392
	(PSI)	29	72	116	44 to 1421	116 to 3539	175 to 5685
	(MPa)	0.2	0.5	0.8	0.3 to 9.8	0.8 to 24.4	1.2 to 39.2

i NOTE

The measuring system may be damaged between p_{max} and p_{burst} , although the device may still appear intact on the outside.

3.3 Electrical parameters

Supply voltage U_B	9.6 to 32 V DC (protected against polarity reversal and overload up to 40 V DC)
Idle current I_L	max. 25 mA (own consumption)
Max. permissible ripple factor	10% (ripple)
Outputs (short-circuit-proof and overload-protected):	
Current carrying capacity I_A	max. 2x250 mA
Voltage drop ΔU_A	max. 2 V DC
Max. switching frequency	100 Hz
Optical functional displays:	
Switching states and/or supply voltage	2x yellow LEDs
Accuracy:	
Switching point accuracy (setting accuracy)	$\pm 2.5\%$ of the measuring end value
Repeat accuracy	$\pm 0.5\%$ of the measuring end value
Temperature influence	$\pm 0.5\%$ of the measuring end value / 10 K
In the compensated temperature range	between 0 to 80°C (TC)
Switching cycles	$N > 50$ million
Switching point setting	Using lockable setting rings
Insulation resistance at 500 V DC	$> 100 \text{ M}\Omega$
Hysteresis	2% of the measuring end value



NOTE

The scale indication is only suitable for approximate setting of the switching points. For a more precise setting, use a pressure gauge.

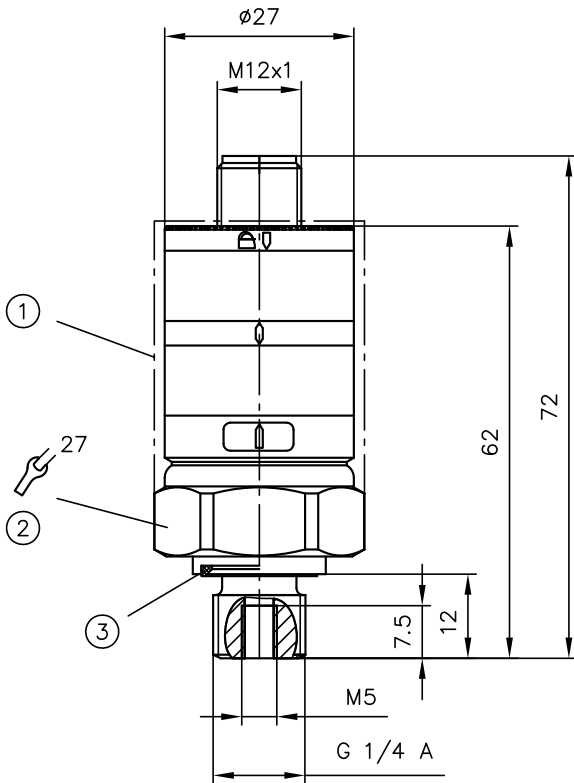
3.4 Electromagnetic compatibility (EMC)

The EMC of the device was tested using an accredited testing laboratory (immunity to interference according to EN 61000-4-XX series). Due to the test set-ups only showing typical uses, this EMC testing does not release the user from carrying out adequate prescribed EMC testing of their complete system (according to EC Directive 89/336/EEC).

4 Dimensions

All dimensions in mm, subject to change.

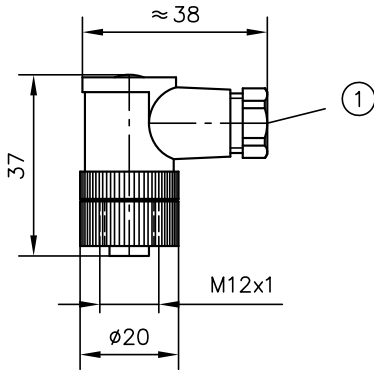
4.1 Electronic pressure switch



- 1 Delivery includes transparent protective cover
- 2 Tightening torque
30 Nm (DG 61., DG 62)
35 Nm (DG 64.)
- 3 Sealing ring DIN 3869 14x1.5 FPM

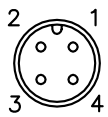
4.2 Assembly accessories

MSD-T7 M12
Line connector



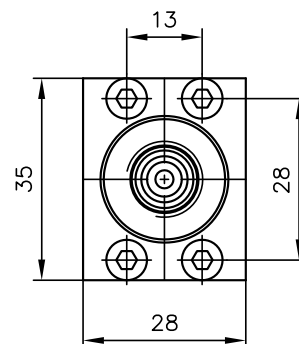
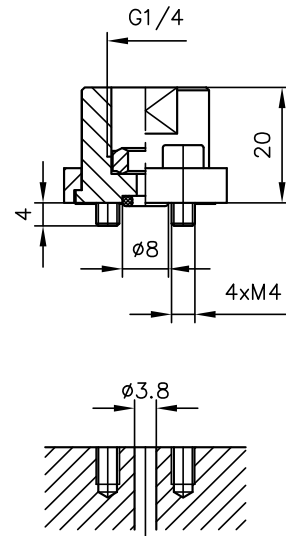
1 Cable feed rotatable by 90°

Bushing

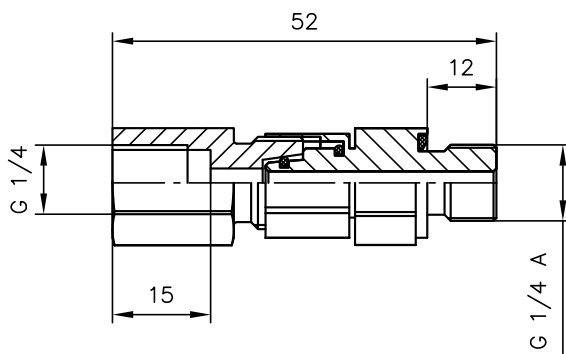


- 1 +24 V
- 2 PNP switching signal
- 3 GND
- 4 IO-Link

Y 9
Flange adapter



X84G
Straight screw-in connector G 1/4 (BSPP)



5.1 Intended use

This product is exclusively intended for hydraulic applications (fluid engineering).

The user must observe the safety measures and warnings in this documentation.

Essential requirements for the product to function correctly and safely:

- All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- The product must only be assembled and put into operation by qualified personnel.
- The product must only be operated within the specified technical parameters. The technical parameters are described in detail in this documentation.
- All components must be suitable for the operating conditions in the event of application in an assembly.
- The operating and maintenance manual of the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.
- ✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to dismantling (in particular in combination with hydraulic accumulators).



DANGER

Risk to life caused by sudden movement of the hydraulic drives when dismantled incorrectly!

Risk of serious injury or death.

- Depressurise the hydraulic system.
- Perform safety measures in preparation for maintenance.

5.2.1 Assembly and setting instructions

Assembly

Attach the electronic pressure switch to a suitable process connection (see [Chapter 4.2, "Assembly accessories"](#)).

Disconnect your system from the power supply and connect the device to the electricity supply using an M12 line connector (see [Chapter 2.1.2, "Assembly accessories"](#)). Please note that the assembly accessories are not included in the scope of delivery for the pressure switch, and must be ordered separately. The "protective cover" accessory included in the scope of delivery can be used to protect the setting rings (e.g. from paint). Once the final setting work on the pressure switch is complete, it can also be sealed to prevent unauthorized adjustment.



NOTE

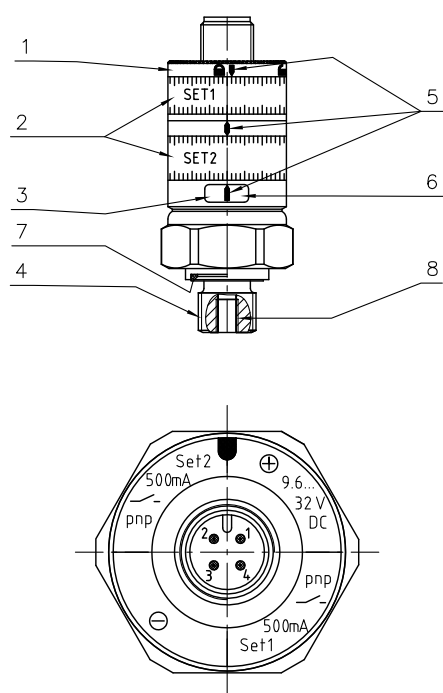
Inadmissible excess pressures and pressure surges must be prevented because they may damage the device.

To avoid or mitigate such effects, contact our specialist staff!

5.2.2 Setting

Control elements

DG 6.



OUT1 (PIN 4): Normally open contact switch output (NO)
 OUT2 (PIN 2): Normally open contact switch output (NO)

OUT1 (OUT2) closes when the set value SET1 (SET2) is reached as pressure is increasing. OUT1 (OUT2) opens when the value "SET 1 (SET2) - hysteresis" is reached as pressure is decreasing. The hysteresis value is 2% of the measuring range end limit.

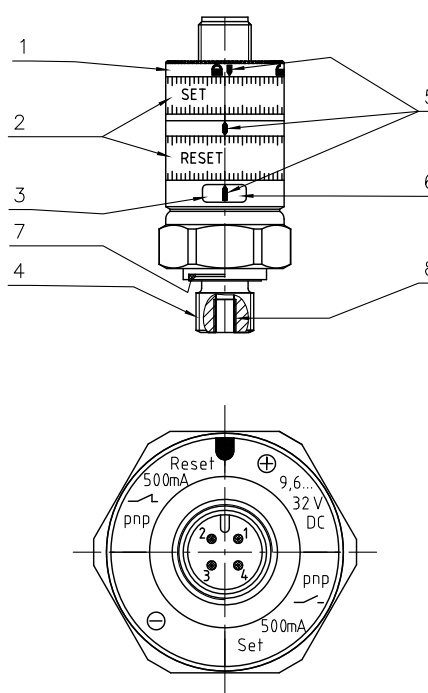
Operation of DG 6.

- Undo the locking ring (1). Once you have done this, the two setting rings (2) can be adjusted by hand.
- Set both setting rings (2) to the desired pressure. The setting marks (5) are located on the housing.
- Secure the setting rings (2) using the locking ring (1).
- Yellow LED (3) lights up when SET1 value has been reached.
- Yellow LED (6) lights up when SET2 value has been reached.
- The elastomer seal (7) fulfils the standard DIN 3869 14x1.5 FKM and can be exchanged.
- Fit the transparent protective cover supplied and seal if required.

Operation of DG 6. R

- Undo the locking ring (1). Once you have done this, the two setting rings (2) can be adjusted by hand.
- Set both setting rings (2) to the desired pressure. The setting marks (5) are located on the housing.
- Secure the setting rings (2) using the locking ring (1).
- Green LED (3) lights up when the supply voltage is connected.
- Yellow LED (6) lights up when SET value has been reached and turns off when it falls below RESET value.
- The elastomer seal (7) fulfils the standard DIN 3869 14x1.5 FKM and can be exchanged.
- Fit the transparent protective cover supplied and seal if required.

DG 6. R



OUT1 (PIN 4): Normally open contact switch output (NO)
 OUT2 (PIN 2): Normally closed contact switch output (NC)

OUT1 closes and OUT2 opens when the specified set value is reached as pressure is increasing. OUT1 opens and OUT2 closes when the specified reset value is reached as pressure is decreasing.

5.3 Operating instructions

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the hydraulic component. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Metal chips
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

i NOTE

New hydraulic fluid from the manufacturer does not necessarily have the required level of purity. The hydraulic fluid must be filtered during filling.

Pay attention to the cleanliness level of the hydraulic fluid to maintain faultless operation..
(Also see cleanliness level in [Chapter 3.1, "General parameters"](#))

Additionally applicable document: [D 5488/1](#) Oil recommendations

5.4 Maintenance information

Conduct a visual inspection at regular intervals, but at least once per year, to check if the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the device surface of dust deposits and dirt at regular intervals, but at least once per year.

Further information

Additional versions

- Pressure switch type DG 7 (2 switch outputs, IO-Link): D 5440 G
- Pressure switch type DG: D 5440
- Pressure switch type DG 51 E: D 5440 E/2
- Electronic pressure transducer type DT 2: D 5440 T/1