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## Operating instructions

### Pressure switches for gas DG..S for NH<sub>3</sub> and O<sub>2</sub>



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## Safety

### Please read and keep in a safe place



Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at [www.docuthek.com](http://www.docuthek.com).

### Explanation of symbols

■, **1**, **2**, **3**... = Action  
> = Instruction

### Liability

We will not be held liable for damages resulting from non-observance of the instructions and non-compliant use.

### Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

#### **DANGER**

Indicates potentially fatal situations.

#### **WARNING**

Indicates possible danger to life and limb.

#### **! CAUTION**

Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

### Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

### Transport

On receipt of the product, check that the delivery is complete (see Part designations). Report any transport damage immediately.

### Storage

Store the product in a dry place. Ambient temperature: see Technical data.

## Checking the usage

### DG

To monitor rising and falling pressure.

	Positive pressure	Negative pressure	Differential pressure
DG..S	NH <sub>3</sub> , O <sub>2</sub> , air	–	–

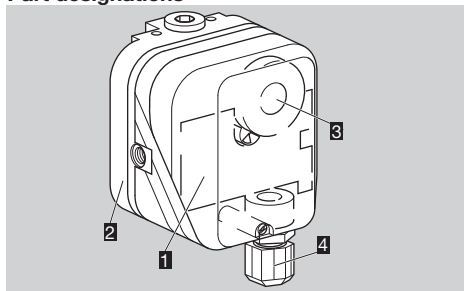
This function is only guaranteed when used within the specified limits – see page 4 (Technical data).

Any other use is considered as non-compliant.

### Type code

Code	Description
<b>DG</b>	Gas pressure switch
<b>6–500</b>	Max. setting in mbar
<b>S</b>	Positive pressure (NH <sub>3</sub> , O <sub>2</sub> )
<b>G</b>	With gold-plated contacts
	Electrical connection
<b>-3</b>	via screw terminals
<b>-4</b>	via screw terminals, IP 65
<b>-5</b>	4-pin plug, without socket
<b>-6</b>	4-pin plug, with socket
<b>-9</b>	4-pin plug, with socket, IP 65
<b>K2</b>	Red/green pilot LED for 24 V DC/AC
<b>T</b>	Blue pilot lamp for 230 V AC
<b>T2</b>	Red/green pilot LED for 230 V AC
<b>N</b>	Blue pilot lamp for 120 V AC
<b>A</b>	External adjustment

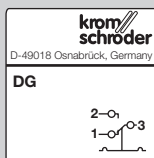
### Part designations



- 1** Upper housing section with cover
- 2** Lower housing section
- 3** Hand wheel
- 4** M16 cable gland

### Type label

Max. inlet pressure, mains voltage, ambient temperature, enclosure: see type label.



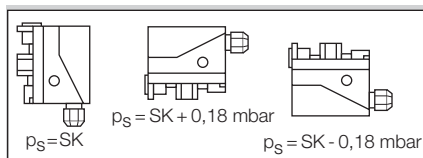
## Installation

### ! CAUTION

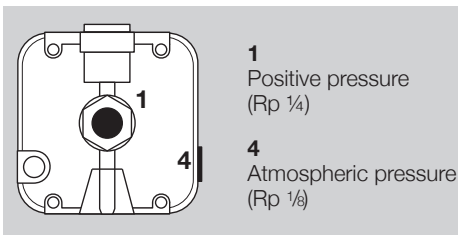
Please observe the following to ensure that the DG is not damaged during installation and operation:

- As the temperature increases, the diffusion rate of NH<sub>3</sub> through the diaphragm also increases which can cause corrosion of the contacts. For this reason, query the closed contacts for opening.
- The medium NH<sub>3</sub> must not condense as this can lead to increased corrosion of the lower section (pressure supply can become blocked) and deformation of the diaphragm (causing the switching point to shift).
- Continuous operation at high temperatures accelerates the ageing of elastomer materials. In places where a high thermal capacity is required, thermal equipment trips must be installed upstream of the DG.
- Use approved sealing material only.
- Check max. ambient temperature – see page 4 (Technical data).
- Condensation or vapours containing silicone must not be allowed to get into the housing. At subzero temperatures malfunctions/failures due to icing can occur.
- The service life will be shorter if subject to ozone concentrations exceeding 200 µg/m<sup>3</sup>. When installing outdoors, place the DG in a roofed area and protect from direct sunlight (even IP 65 version). To avoid condensation, the cover with pressure equalization element can be used.
- Avoid subjecting the DG to strong or violent vibrations.

- ▷ Installation position as required, preferably with vertical diaphragm. Then the switching point  $p_S$  corresponds to the scale value SK set on the hand wheel. In other installation positions, the switching point  $p_S$  will change and no longer correspond to the scale value SK set on the hand wheel. Check the switching point.



- ▷ The DG must not be in contact with masonry. Minimum clearance 20 mm.
- ▷ Ensure that there is sufficient installation space.
- ▷ Ensure unobstructed view of the hand wheel.
- 1** Disconnect the system from the electrical power supply.
- 2** Shut off the medium supply.
- 3** Ensure that the pipeline is clean.



	Connect	Seal	Free
Positive pressure DG..S	1	–	–

- 4** If the electrical contacts in the DG..S could be soiled by dirt particles in the surrounding air or in the medium, use a filter pad at port **4**.

## Wiring

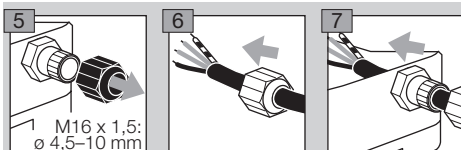
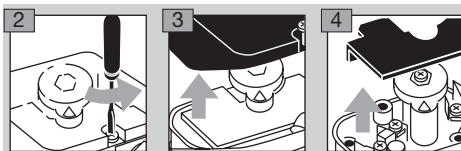
- ▷ If the DG..SG has switched a voltage > 24 V and a current > 0.1 A once, the gold plating on the contacts will have been burnt through. It can then only be operated at this power rating or higher power rating.
- ▷ Pressure switch DG can be used in Zone 1 and 2 hazardous areas if an isolating amplifier is installed upstream in the safe area as “Ex-i” equipment pursuant to EN 60079-11 (VDE 0170-7):2007.
- ▷ DG as “simple electrical equipment” pursuant to EN 60079-11:2007 corresponds to the Temperature class T6, Group II. The internal inductance/capacitance is  $L_0 = 0.2 \mu\text{H}/C_0 = 8 \text{ pF}$ .
- ▷ In the case of low switching capacities, such as 24 V, 8 mA, for example, we recommend using an RC module ( $22 \Omega$ ,  $1 \mu\text{F}$ ) in air containing silicone or oil.

## ! CAUTION

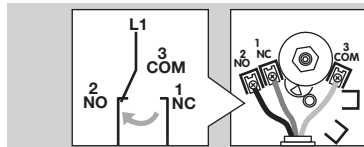
Please observe the following to ensure that the DG is not damaged during operation:

- Note the switching capacity, see page 4 (Technical data).

- 1** Disconnect the system from the electrical power supply.



- ▷ Contacts **3** and **2** close when subject to increasing pressure. Contacts **1** and **3** close when subject to falling pressure.

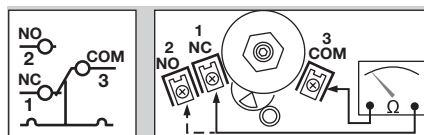


## Adjustment

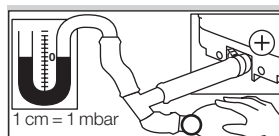
- ▷ The switching point is adjustable via hand wheel.
- 1** Disconnect the system from the electrical power supply.

- 2** Detach the housing cover, see page 3 (Wiring).

- 3** Connect an ohmmeter.



- 4** Set the switching point using the hand wheel.
- 5** Connect a pressure gauge.



- 6** Apply pressure. In doing so, monitor the switching point on the ohmmeter and the pressure gauge.

Type	Adjusting range* [mbar]	Switching differential** [mbar]
DG 6	0.4–6	0.2–0.3
DG 10	1–10	0.25–0.4
DG 30	2.5–30	0.35–0.9
DG 50	2.5–50	0.8–1.5
DG 150	30–150	3–5
DG 400	50–400	5–15
DG 500	100–500	8–17

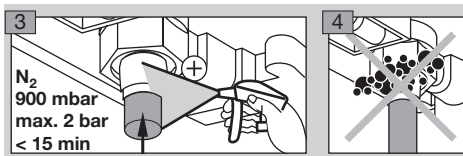
\* Adjusting tolerance =  $\pm 15\%$  of the scale value.

\*\* Mean switching differential at min. and max. setting.

- ▷ If the DG does not trip at the desired switching point, correct the adjusting range using the hand wheel. Relieve the pressure and repeat the process.

## Tightness test

- 1 Shut off the downstream pipeline close to the valve.
  - 2 Open the valve and the medium supply.
- ▷ Check all used ports for tightness.



## Maintenance

In order to ensure smooth operation: check the tightness and function of the DG every year.

- ▷ After carrying out the maintenance work, check for tightness, see page 4 (Tightness test).

## Technical data

Gas type:  $\text{NH}_3$ ,  $\text{O}_2$  and air.

Max. test pressure for testing the entire system: temporarily < 15 minutes 2 bar.

Switching capacity:

DG, U = 24 – 250 V AC:

I = 0.05 – 5 A at  $\cos \varphi = 1$ ,

I = 0.05 – 1 A at  $\cos \varphi = 0.6$ .

DG..G, U = 5 – 250 V AC:

I = 0.01 – 5 A at  $\cos \varphi = 1$ ,

I = 0.01 – 1 A at  $\cos \varphi = 0.6$ .

DG..G, U = 5 – 48 V DC:

I = 0.01 – 1 A.

Max. medium temperature: -15 to +80°C.

Storage and transport temperature: -40 to +80°C.

RoHS compliant pursuant to 2002/95/EC.

Diaphragm pressure switch, silicone-free.

Diaphragm: IIR.

Housing: glass fibre reinforced PBT plastic with low gas release.

Lower housing section: AlSi 12.

Enclosure: IP 54 or IP 65.

Safety class: 1.

Line entrance: M16 x 1.5, clamping range: diameters of 4 to 10 mm.

Electrical connection type: screw terminals.

Weight: 270 g – 320 g.

## Declaration of conformity



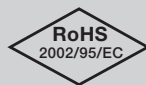
We, the manufacturer, hereby declare that the product DG..S complies with the essential requirements of the following Directive:

– 2006/95/EC

The production is subject to the Quality System pursuant to DIN EN ISO 9001:2008, TÜV NORD CERT. Elster GmbH

Scan of the Declaration of conformity (D, GB) – see [www.docuthek.com](http://www.docuthek.com)

## RoHS compliant



## Contact

If you have any technical questions, please contact your local branch office/agent. The addresses are available on the Internet or from Elster GmbH.

We reserve the right to make technical modifications in the interests of progress.

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