

Pressure switches for gas DG..S for NH₃ and O₂

OPERATING INSTRUCTIONS

· Edition 02.24 · EN · 03251233



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1 SAFETY

1.1 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.

1.2 Explanation of symbols

1, 2, 3, a, b, c = Action

→ = Instruction

1.3 Liability

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

1.4 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.

1.5 Conversion, spare parts

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

2 CHECKING THE USAGE

To monitor rising and falling pressure.

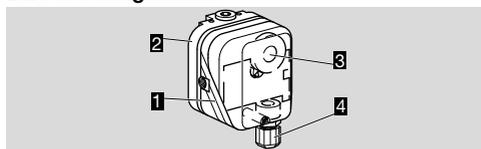
	Positive pressure	Negative pressure	Differential pressure
DG..S	NH ₃ , O ₂ , air	–	–

This function is only guaranteed when used within the specified limits – see page 6 (9 Technical data). Any other use is considered as non-compliant.

2.1 Type code

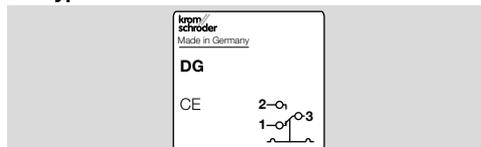
DG	Pressure switch for gas
6	Adjusting range 40–600 Pa (0,4–6 mbar)
10	Adjusting range 100–1000 Pa (1–10 mbar)
50	Adjusting range 0,25–5 kPa (2,5–50 mbar)
150	Adjusting range 3–15 kPa (30–150 mbar)
500	Adjusting range 10–50 kPa (100–500 mbar)
S	Positive pressure for oxygen and ammonia
G	With gold-plated contacts
-3	Electrical connection via screw terminals
-4	Electrical connection via screw terminals, IP 65
-5	Electrical connection via 4-pin plug, without socket, IP 54
-6	Electrical connection via 4-pin plug, with socket, IP 54
-9	Electrical connection via 4-pin plug, with socket, IP 65
K2	Red/green pilot LED for 24 V DC/AC
T	Blue pilot lamp for 230 V AC
T2	Red/green pilot LED for 110 to 230 V AC
N	Blue pilot lamp for 120 V AC
A	External adjustment

2.2 Part designations



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

2.3 Type label



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

3 INSTALLATION

⚠ CAUTION

Please observe the following to ensure that the unit is not damaged during installation:

- Dropping the device can cause permanent damage. In this event, replace the entire device and associated modules before use.
- Use approved sealing material only.
- Check max. ambient temperature – see page 6 (9.1 Ambient conditions).
- As the temperature increases, the diffusion rate of NH₃ through the diaphragm also increases which can cause corrosion of the contacts. For this reason, query the closed contacts for opening.
- The medium NH₃ 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.
- The service life will be shorter if subject to ozone concentrations exceeding 200 µg/m³.
- When installing outdoors, place the pressure switch 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. See accessories.
- Condensation or vapours containing silicone must not be allowed to get into the housing. If possible, install pipework with an ascending gradient. Otherwise, there is a risk of icing of condensation at subzero temperatures, the switching point shifting or corrosion in the device which can lead to malfunctions.
- Avoid strong impact on the unit.

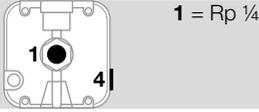
- The DG must not be in contact with masonry. Minimum clearance 20 mm.
- Ensure that there is sufficient installation space.
- Ensure unobstructed view of the hand wheel.

3.1 Installation position

Installation in the vertical or horizontal position, or sometimes upside down, preferably with vertical diaphragm. If installed in a vertical position, the switching point p_S will correspond to the scale value SK set on the hand wheel. If installed in another position, the switching point p_S will change and no longer correspond to the set scale value SK. Switching point p_S must be checked.

$p_S = SK$	$p_S = SK + 18 Pa$ (0.18 mbar)	$p_S = SK - 18 Pa$ (0.18 mbar)

3.2 Connection options

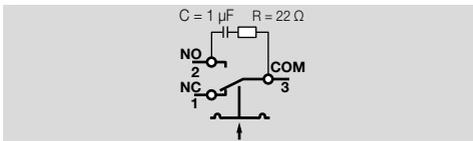


DG..S	Connect	Seal	Free
Positive pressure	1	-	-

→ If the electrical contacts in the pressure switch could be soiled by dirt particles in the surrounding air or in the medium, use a filter pad (Order No. 74916199) at port 4. On IP 65 units, the filter pad is fitted as standard, see type label.

4 WIRING

Pressure switch DG..S can be used in Zone 1 (21) and 2 (22) hazardous areas if an isolating amplifier is installed upstream in the safe area as "Ex-i" apparatus pursuant to EN 60079-11 (VDE 0170-7):2012. DG..S as "simple electrical apparatus" pursuant to EN 60079-11:2012 corresponds to the Temperature class T6, Group II. The internal inductance/capacitance is $L_i = 0.2 \mu H / C_i = 8 pF$. In the case of low switching capacities, such as 24 V, 8 mA, for example, we recommend using an RC module (22 Ω , 1 μF) in air containing silicone oil.

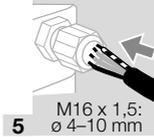
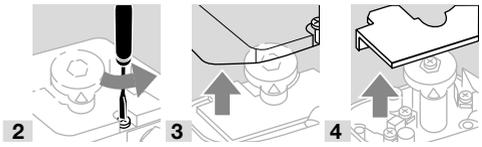


→ If the pressure switch has switched a voltage $> 24 V$ ($> 30 V$) and a current $> 0.1 A$ at $\cos \varphi = 1$ or $> 0.05 A$ at $\cos \varphi = 0.6$ once, the gold plating on the contacts will have been burnt through. It can then only be operated at this power rating or higher power rating.

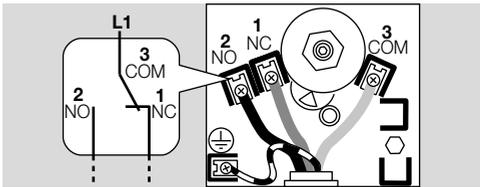
⚠ CAUTION

- To ensure that the DG..S is not damaged during operation, note the switching capacity, see page 6 (9 Technical data).

1 Disconnect the system from the electrical power supply.

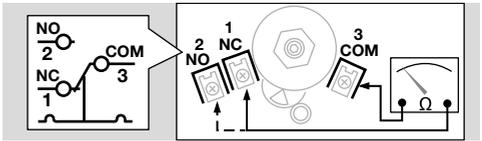


5 Wire as shown on the connection diagram.
6 Tighten the M16 gland (1/2" NPT conduit).
→ Contacts 3 and 2 close when subject to increasing pressure. Contacts 1 and 3 close when subject to falling pressure. With the NO contact, the NC contact is omitted.

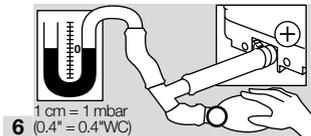


5 ADJUSTMENT

→ The switching point is adjustable via hand wheel.
1 Disconnect the system from the electrical power supply.
2 Unscrew the housing cover.
→ Once the settings have been adjusted successfully, fit the housing cover again. Note the tightening torques, see page 6 (9 Technical data).
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.
8 If the DG..S does not trip at the desired switching point, correct the adjusting range using the hand wheel. Relieve the pressure and repeat the process.

5.1 Adjusting range

DG..S	Adjusting range ¹⁾	Switching differential ²⁾
DG 6	40–600 Pa (0.4–6 mbar)	10–25 Pa (0.1–0.25 mbar)
DG 10	100–1000 Pa (1–10 mbar)	15–40 Pa (0.15–0.4 mbar)
DG 50	0.25–5 kPa (2.5–50 mbar)	0.05–0.12 kPa (0.5–1.2 mbar)
DG 150	3–15 kPa (30–150 mbar)	0.22–0.55 kPa (2.2–5.5 mbar)
DG 500	10–50 kPa (100–500 mbar)	0.8–1.5 kPa (8–15 mbar)

1) Adjusting tolerance = ± 15% of the scale value.

2) Mean switching differential at min. and max. setting.

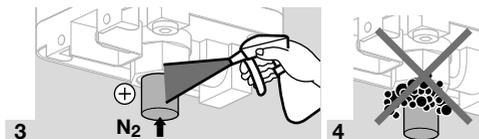
6 TIGHTNESS TEST

Check all gas ports used for tightness.

1 Shut off the downstream gas pipeline close to the valve.

2 Open the valve and the gas supply.

→ N₂ = 900 mbar, max. 2 bar (13 psi, max. 29 psi)
< 15 min.



7 MAINTENANCE

In order to ensure smooth operation, check the tightness and function of the pressure switch every year.

→ After carrying out the maintenance work, check for tightness, see page 4 (6 Tightness test).

8 ACCESSORIES

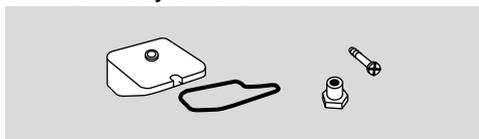
8.1 Filter pad set

To protect the electrical contacts in the DG..S from dirt particles in the surrounding air or in the medium, use a filter pad at the 1/8" negative pressure port.

As standard on IP 65 units.

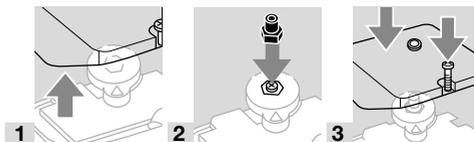
5-piece filter pad set, Order No.: 74916199

8.2 External adjustment

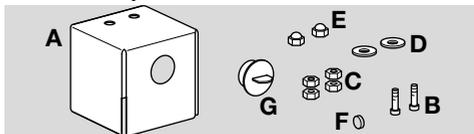


In order to set the switching pressure from the outside, the cover for external adjustment (6 mm Allen key) for DG..S can be retrofitted.

Order No.: 74916155



8.3 Weather protection cover



When the DG is installed outdoors, the weather protection cover provides permanent protection against condensation and weathering of housing parts.

The weather protection cover is made of 1 mm-thick stainless steel.

The enclosed filter pad is designed to protect the open 1/8" port from the ingress of dirt or insects.

Scope of delivery:

A 1 x covers, 100 x 100 x 100 mm

B 2 x M4 x 16 screws

C 4 x nuts

D 2 x washers

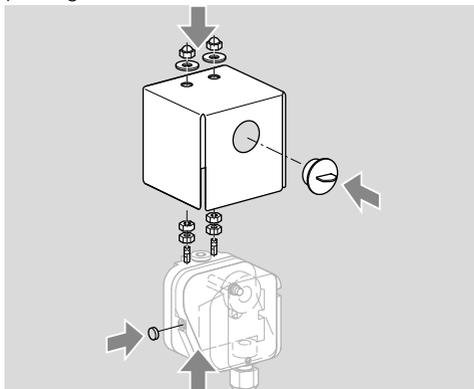
E 2 x cap nuts

F 1 x filter pad (1/8" port)

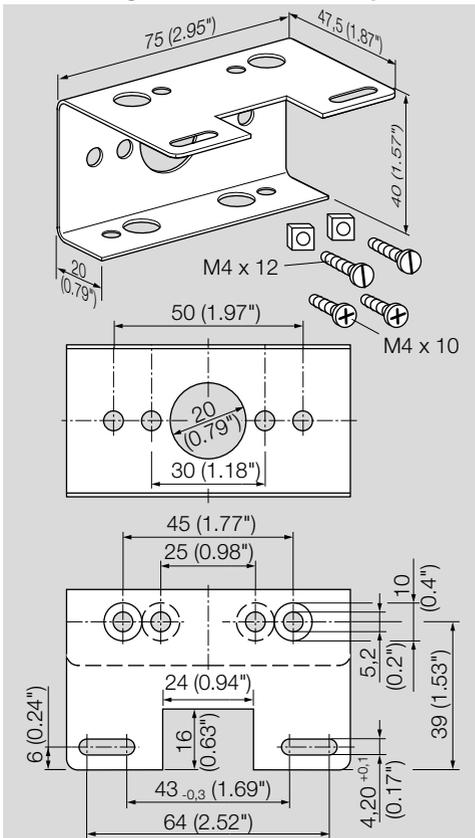
G 1 x grip plug

Order No.: 74924909

Installation position: vertical, with the cable gland pointing downwards.

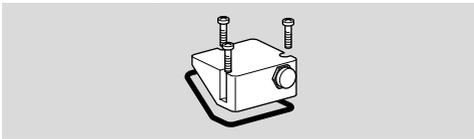


8.4 Fastening set with screws, U-shape bracket



Order No.: 74915387

8.5 Pressure equalization element

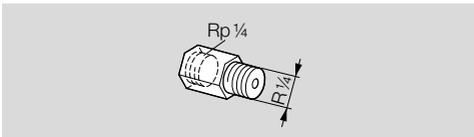


For CE certified pressure switches.

To avoid the formation of condensation, the cover with pressure equalization element can be used.

The diaphragm in the screw connector is designed to ventilate the cover, without allowing water to enter.
Order No.: 74923391

8.6 Restrictor orifice



For CE certified pressure switches.

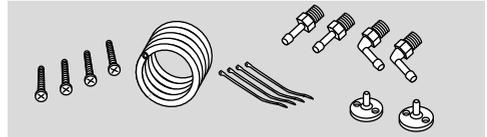
In the case of high pressure fluctuations, we recommend using a restrictor orifice (contains non-ferrous metals).

Hole diameter 0.2 mm, Order No.: 75456321

Hole diameter 0.3 mm, Order No.: 75441317

8.7 Tube set

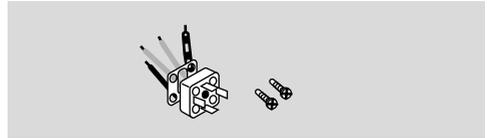
To be used with air only.



Tube set with 2 m PVC tube (\varnothing 4,75 x 1 mm), 2 duct connection flanges with screws, R 1/4 and R 1/8 connecting nipples.

Order No.: 74912952.

8.8 Standard coupler plug

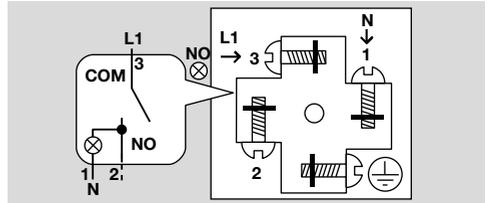


Order No.: 74920412

8.9 Standard coupler plug set



For CE certified pressure switches, Order No.: 74915388



8.10 Pilot lamp, red/blue

Pilot lamp, red

110/120 V AC, I = 1.2 mA, Order No.: 74920430.

230 V AC, I = 0.6 mA, Order No.: 74920429.

Pilot lamp, blue

110/120 V AC, I = 1.2 mA, Order No.: 74916121.

230 V AC, I = 0.6 mA, Order No.: 74916122.



9 TECHNICAL DATA

9.1 Ambient conditions

Max. medium and ambient temperatures:

-15 to +80°C (5 to 176°F),

-20 to +80°C (-4 to +176°F).

Storage and transport temperatures: -20 to +40°C (-4 to +104°F).

Icing, condensation and dew in and on the unit are not permitted.

Enclosure: IP 54 or IP 65. Safety class: 1.

This unit is not suitable for cleaning with a high-pressure cleaner and/or cleaning products.

9.2 Mechanical data

Gas type: NH₃, O₂ and air.

Max. inlet pressure $p_{max.}$ = withstand pressure: 600 mbar.

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

Diaphragm pressure switch, silicone-free.

Diaphragm: IIR.

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

Lower housing section: AISi 12.

Weight: 270 to 320 g.

9.3 Electrical data

Switching capacity:

	U	I (cos φ = 1)	I (cos φ = 0.6)
DG	24– 250 V AC	0.05–5 A	0.05–1 A
DG..G	5–250 V AC	0.01–5 A	0.01–1 A
DG..G	5–48 V DC	0.01–1 A	0.01–1 A

Conductor diameter: 0.5 to 1.8 mm (AWG 24 to AWG 13).

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

Type of connection: screw terminals.

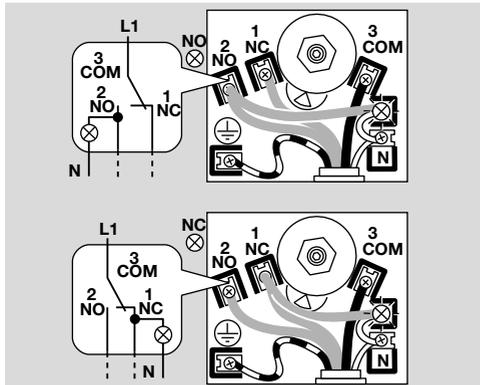
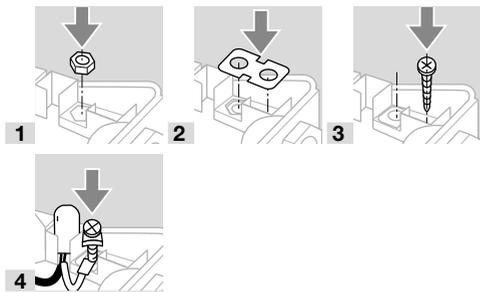
10 DESIGNED LIFETIME

This information on the designed lifetime is based on using the product in accordance with these operating instructions. Once the designed lifetime has been reached, safety-relevant products must be replaced.

Designed lifetime (based on date of manufacture): 10 years.

You can find further explanations in the applicable rules and regulations and on the afecor website (www.afecor.org).

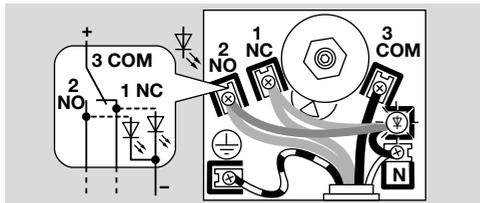
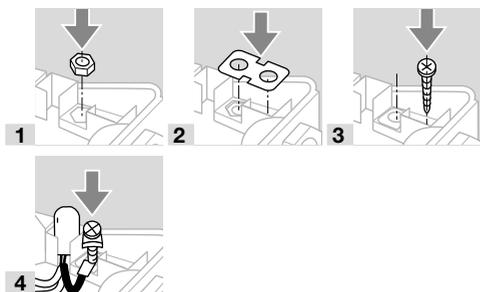
This procedure applies to heating systems. For thermoprocessing equipment, observe local regulations.



8.11 Red/green LED for 24 V DC/AC or 110–230 V AC

24 V DC, I = 16 mA; 24 V AC, I = 8 mA, Order No.: 74921089.

110 to 230 V AC, Order No.: 74923275.



11 CERTIFICATION

11.1 Certificate download

Certificates – see www.docuthek.com

11.2 Declaration of conformity



We, the manufacturer, hereby declare that the products DG..S comply with the requirements of the listed Directives and Standards.

Directives:

- 2014/35/EU
- 2014/30/EU
- 2011/65/EU – RoHS I
- 2015/863/EU – RoHS II

Standards:

Based on

- EN 1854:2010

Elster GmbH

11.3 Eurasian Customs Union



The products DG..S meet the technical specifications of the Eurasian Customs Union.

11.4 REACH Regulation

The device contains substances of very high concern which are listed in the Candidate List of the European REACH Regulation No. 1907/2006. See Reach list HTS at www.docuthek.com.

11.5 China RoHS

Directive on the restriction of the use of hazardous substances (RoHS) in China. Scan of the Disclosure Table China RoHS2, see certificates at www.docuthek.com.

12 LOGISTICS

Transport

Protect the unit from external forces (blows, shocks, vibration).

Transport temperature: see page 6 (9 Technical data).

Transport is subject to the ambient conditions described.

Report any transport damage on the unit or packaging without delay.

Check that the delivery is complete.

Storage

Storage temperature: see page 6 (9 Technical data).

Storage is subject to the ambient conditions described.

Storage time: 6 months in the original packaging before using for the first time. If stored for longer than this, the overall service life will be reduced by the corresponding amount of extra storage time.

13 DISPOSAL

Devices with electronic components:

WEEE Directive 2012/19/EU – Waste Electrical and Electronic Equipment Directive



At the end of the product life (number of operating cycles reached), dispose of the packaging and product in a corresponding recycling centre. Do not dispose of the unit with the usual domestic refuse. Do not burn the product.

On request, old units may be returned carriage paid to the manufacturer in accordance with the relevant waste legislation requirements.

FOR MORE INFORMATION

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschroder and Maxon. To learn more about our products, visit ThermalSolutions.honeywell.com or contact your Honeywell Sales Engineer.

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