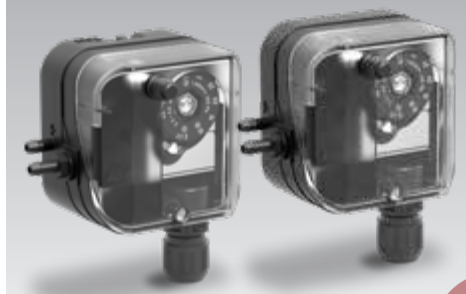


03251434



## Operating instructions

### Pressure switches for air DL..H, DL..N



**Cert. version 11.17**

## 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 damage 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.

## Changes to edition 04.19

The following chapters have been changed:

- Installation

## Checking the usage

### DL..H, DL..N

For monitoring increasing and decreasing air or flue gas pressure.

DL..H switches and locks off with rising pressure, DL..N switches and locks off with falling pressure. They can be unlocked using the manual reset.

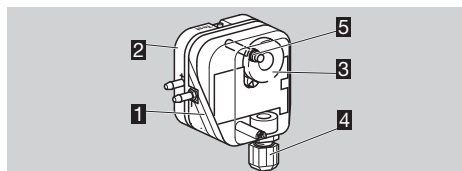
This function is only guaranteed when used within the specified limits – see page 5 (Technical data).

Any other use is considered as non-compliant.

### Type code

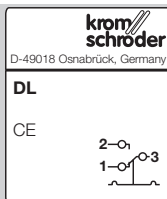
| Code            | Description                            |
|-----------------|--|
| <b>DL</b>       | Air pressure switch                    |
| <b>10 – 150</b> | Max. setting in mbar                   |
| <b>A</b>        | Rp 1/4, tube connection and hand wheel |
| <b>K</b>        | Tube connection and hand wheel         |
| <b>H</b>        | Locks off with rising pressure         |
| <b>N</b>        | Locks off with falling pressure        |
| <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
- 5** DL..H, DL..N with manual reset

## Type label



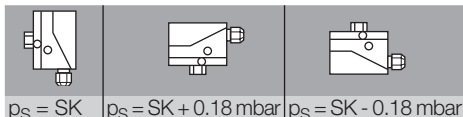
Max. inlet pressure  $p_{max.}$  = withstand pressure, mains voltage, ambient temperature, enclosure: see type label.

## Installation

### ! CAUTION

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

- Dropping the device can cause permanent damage. In this event, replace the entire device and associated modules before use.
  - Check max. ambient temperature – see page 5 (Technical data).
  - When using silicone tubes, only use silicone tubes which have been sufficiently cured.
  - Vapours containing silicone must not be allowed to get into the housing.
  - Condensation 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  $200 \mu\text{g}/\text{m}^3$ . When installing outdoors, place the DL in a roofed area and protect from direct sunlight (even IP 65 version).
  - Avoid subjecting the DL to strong or violent vibrations.
  - In case of highly fluctuating pressures, install a restrictor orifice, see page 4 (Restrictor orifice for DL..A).
- ▷ Ensure that there is sufficient installation space.
- ▷ Ensure unobstructed view of the hand wheel.
- ▷ 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.



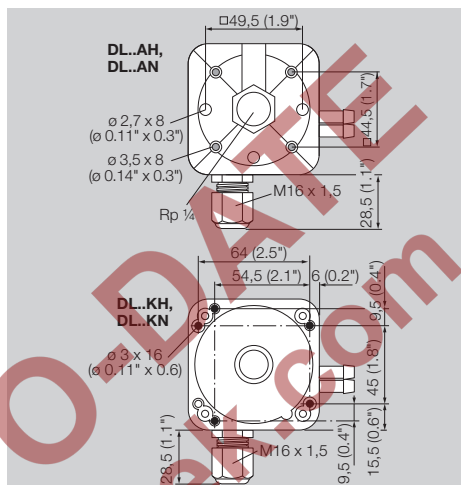
## Connection facilities

- ▷ For 1 mm thick mounting plates, use self-tapping screws for plastic:

DL..AH, DL..AN:  $\varnothing 3.5 \times 8 \text{ mm}$  or  $\varnothing 4 \times 8 \text{ mm}$ .

DL..KH, DL..KN:  $\varnothing 3.5 \times 16 \text{ mm}$ .

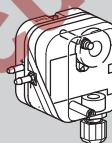
### 1 Fit the DL.



### 2 Connect the pressure line.

- ▷ DL..A: upon delivery, port 2 is closed off by a rubber cap.

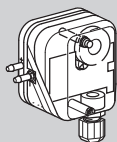
#### DL..A



- 1 = Rp 1/4 (+)  
2 =  $\varnothing 4,75 \times 1 \text{ mm}$  (+)  
3 =  $\varnothing 4,75 \times 1 \text{ mm}$  (-)  
4 = Rp 1/8 (-)

- ▷ Positive pressure, port 1 or 2  
▷ Negative pressure, port 3; after unscrewing port 3 also port 4

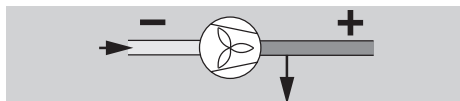
#### DL..K



- 2 =  $\varnothing 4,75 \times 1 \text{ mm}$  (+)  
3 =  $\varnothing 4,75 \times 1 \text{ mm}$  (-)  
4 = Rp 1/8 (-)

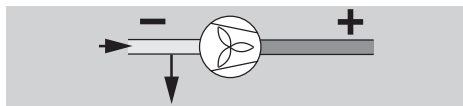
- ▷ Positive pressure, port 2  
▷ Negative pressure, port 3; after unscrewing port 3 also port 4

### Positive pressure measurement



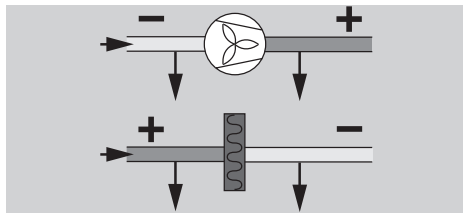
- ▷ 1 or 2 = positive pressure port (+).  
▷ If port 2 is used, close off port 1.  
▷ 3 or 4 = remains open to ventilate the upper diaphragm chamber.

## Negative pressure measurement



- ▷ 3 or 4 = negative pressure port (-).
- ▷ 1 or 2 = remains open to ventilate the upper diaphragm chamber.

## Differential pressure measurement



- ▷ 1 or 2 = port for the higher positive pressure or lower negative pressure (+).
- ▷ 3 or 4 = port for the lower positive pressure or higher negative pressure (-).

**3** Seal the ports that are not in use.

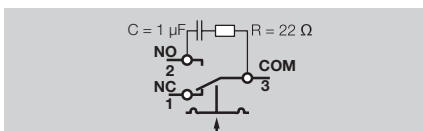
## Wiring

- ▷ If the DL..G has switched a voltage  $> 24\text{ V}$  and a current  $> 0.1\text{ A}$  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 DL 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" equipment pursuant to EN 60079-11 (VDE 0170-7):2012.
- ▷ DL as "simple electrical equipment" pursuant to EN 60079-11:2012 corresponds to the Temperature class T6, Group II. The internal inductance/capacitance is  $L_i = 0.2\text{ }\mu\text{H}/C_i = 8\text{ pF}$ .

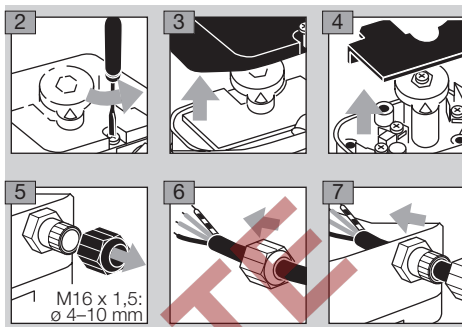
## ! CAUTION

To ensure that the DL is not damaged during operation, note the switching capacity, see page 5 (Technical data).

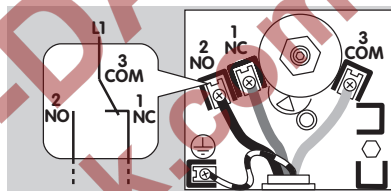
- ▷ In the case of low switching capacities, such as  $24\text{ V}$ ,  $8\text{ mA}$ , for example, we recommend using an RC module ( $22\text{ }\Omega$ ,  $1\text{ }\mu\text{F}$ ) in air containing silicone or oil.



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



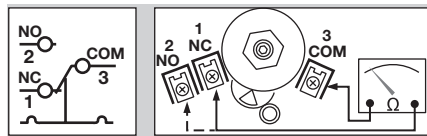
- ▷ Contacts **3** and **2** close when subject to increasing pressure. Contacts **1** and **3** close when subject to falling pressure.



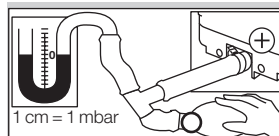
## Adjustment

- ▷ The switching point is adjustable via hand wheel.

  - 1** Disconnect the system from the electrical power supply.
  - 2** Detach the housing cover, see page 5 (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.
- ▷ Max. inlet pressure  $p_{\text{max.}} = 300\text{ mbar}$  = withstand pressure.

| Type           | Adjusting range* [mbar] | Reset pressure** [mbar] |
|----------------|-------------------------|-------------------------|
| DL 10..H, ..N  | 1 – 10                  | 0.4 – 1                 |
| DL 50..H, ..N  | 2.5 – 50                | 1 – 2                   |
| DL 150..H, ..N | 30 – 150                | 2 – 5                   |

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

\*\* Difference between switching pressure and possible reset.

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

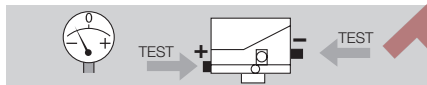
- ▷ Deviation from the switching point during testing pursuant to EN 1854: air pressure switch:  $\pm 15\%$ .
- ▷ If the DL does not trip at the desired switching point, correct the adjusting range using the hand wheel. Relieve the pressure and repeat the process.

## Function check

- ▷ We recommend a function check once a year. DL..A
- ▷ Press the test key during operation – the pressure switch switches.

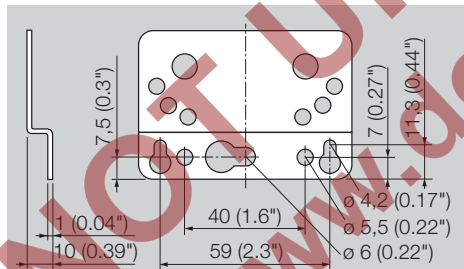


- ▷ In case of differential pressure, press both keys simultaneously.



## Accessories

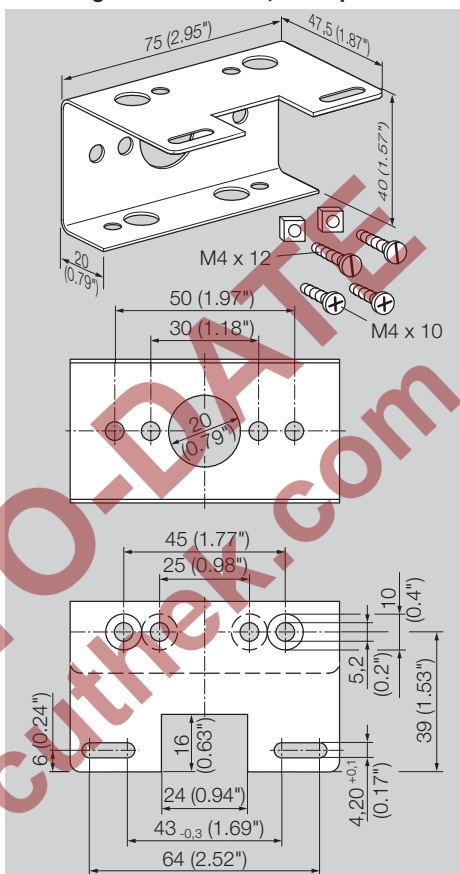
### Z-angle bracket



DL..K: Order No.: 74916158

DL..A: Order No.: 74913661

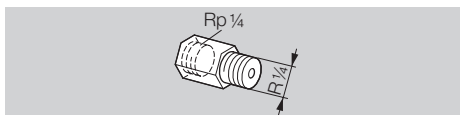
### Fastening set with screws, U-shape bracket



Order No.: 74915387

### Restrictor orifice for DL..A

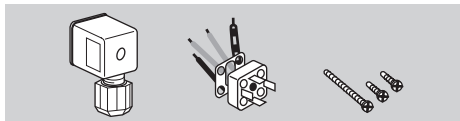
In the case of high pressure fluctuations, we recommend using a restrictor orifice (contains non-ferrous metals).



Hole diameter  $\varnothing 0.2$  mm, Order No.: 75456321.

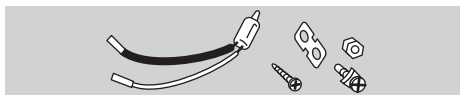
Hole diameter  $\varnothing 0.3$  mm, Order No.: 75441317.

### Standard coupler plug



Order No.: 74916159

### Pilot lamp set, red or blue



Pilot lamp, red:

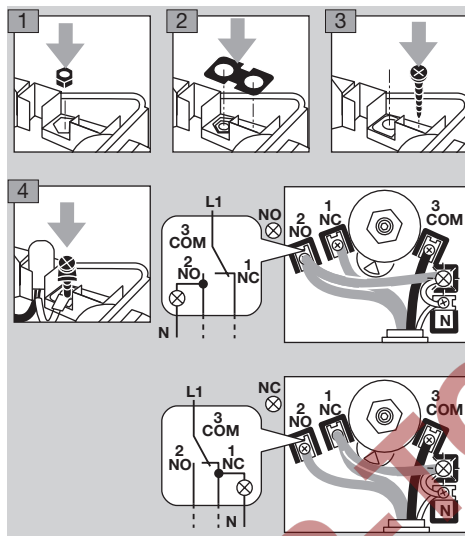
110/120 V AC, I = 1.2 mA, Order No.: 74920430;

220/250 V AC, I = 0.6 mA, Order No.: 74920429.

Pilot lamp, blue:

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

220/250 V AC, I = 0.6 mA, Order No.: 74916122.



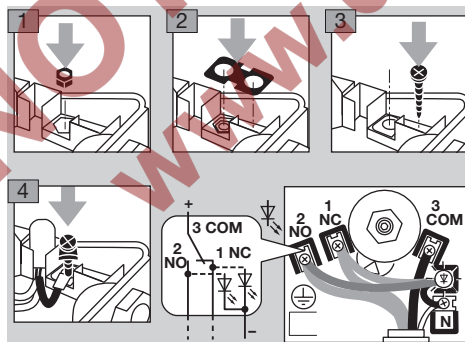
#### LED set, red/green



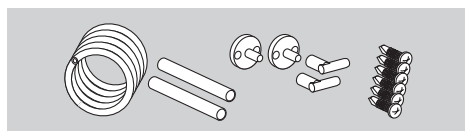
24 V DC, I = 16 mA; 24 V AC, I = 8 mA.

Order No.: 74921089;

230 V AC, I = 0.6 mA, Order No.: 74923275.



#### Tube set



Order No.: 74919272

## Technical data

### Ambient conditions

Not suitable for cleaning with a high-pressure cleaner and/or cleaning products.

Maximum medium and ambient temperatures:

-15 to +60°C (5 to 140°F).

Long-term use in the upper ambient temperature range accelerates the ageing of the elastomer materials and reduces the service life (please contact manufacturer).

Storage and transport temperature:

-20 to +40°C (-4 to +104°F).

Enclosure to IEC 60529: IP 54, IP 65.

### Mechanical data

Gas type: air or flue gas, no flammable gases, no aggressive gases.

Max. inlet pressure  $p_{max.}$  = withstand pressure: 300 mbar.

Diaphragm pressure switch, silicone-free.

Diaphragm: NBR.

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

Max. tightening torque, see Technical Information bulletin DL (D, GB, F) – [www.docuthek.com](http://www.docuthek.com).

Weight: DL..A: 200 g (7.1 oz), DL..K: 190 g (6.7 oz).

### Electrical data

Micro switch to EN 61058-1.

Contact gap < 3 mm ( $\mu$ ).

Switching capacity:

|       | U                       | I (cos $\varphi$ = 1) | I (cos $\varphi$ = 0.6) |
|-------|-------------------------|-----------------------|-------------------------|
| DL    | 24–250 V AC             | 0.05–5 A              | 0.05–1 A                |
| DL..G | 5–250 V AC<br>5–48 V DC | 0.01–5 A              | 0.01–1 A                |

Safety class II to VDE 0106-1.

Cable diameter: 0.5 to 1.8 mm

(AWG 24 to AWG 13).

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

Type of connection: screw terminals.

### 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) in accordance with EN 13611, EN 1854 for pressure switches: 10 years.

You can find further explanations in the applicable rules and regulations and on the afecor website ([www.afecor.org](http://www.afecor.org)). This procedure applies to heating systems. For thermoprocessing equipment, observe local regulations.

## Logistics

### Transport

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

Transport temperature: see page 5 (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, see page 1 (Part designations).

### Storage

Storage temperature: see page 5 (Technical data).

Storage is subject to the ambient conditions described.

Storage time: 6 months 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.

### Packaging

The packaging material is to be disposed of in accordance with local regulations.

### Disposal

Components are to be disposed of separately in accordance with local regulations.

## Certification

### Declaration of conformity

We, the manufacturer, hereby declare that the product DL with product ID No. CE-0085AP0466 complies with the requirements of the listed Directives and Standards.

Directives:

– 2014/35/EU – LVD

Regulation:

– (EU) 2016/426 – GAR

Standards:

– EN 13611:2015+AC:2016

– EN 1854:2010

The relevant product corresponds to the tested type sample.

The production is subject to the surveillance procedure pursuant to Regulation (EU) 2016/426 Annex III paragraph 3.

Elster GmbH

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

### RoHS compliant



### 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](http://www.docuthek.com)

## 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.

# Honeywell

**krom/  
schroder**

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