



## UHV gate valve with pneumatic actuator

This manual is valid for the valve ordering number(s):

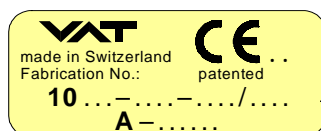
10836- . E14/24/34/44

10840- . E14/24/34/44

10844- . E14/24/34/44

10846- . E14/24/34/44

The fabrication number is indicated on each product as per the label below (or similar):



← Fabrication number



### Explanation of symbols:



Read declaration carefully before you start any other action!



Attention!



Product is in conformity with EC guidelines!



Disconnect electrical power and compressed air lines. Do not touch parts under voltage!



Keep body parts and objects away from the valve opening!



Hot surfaces; do not touch!



Loaded springs and/or air cushions are potential hazards!



Wear gloves!



Read these «**Installation, Operating & Maintenance Instructions**» and the enclosed «**General Safety Instructions**» carefully before you start any other action!



Installation, Operating & Maintenance Instructions  
**Series 10.8, DN 63 - 200 (2½" - 8")**

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## 1 Use of product

Use product for clean and dry indoor vacuum applications under the conditions indicated in chapter «Technical data» only!  
Other applications are only allowed with the written permission of VAT.

### 1.1 Technical data

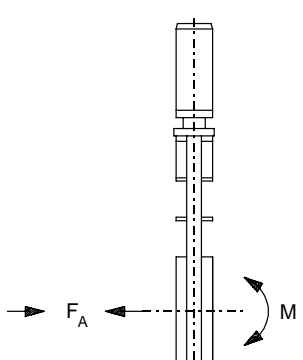
|                                    |   |
|------------------------------------|---|
| Pressure range                     | 1 x 10 <sup>-10</sup> mbar to 1.6 bar (abs) |
| Differential pressure on the gate  | ≤ 1.6 bar in either direction               |
| Differential pressure at opening   | ≤ 30 mbar                                   |
| Admissible temperature: Valve      | ≤ 250°C open, 200°C closed                  |
| Pneumatic actuator                 | ≤ 200°C                                     |
| Position indicator                 | ≤ 80°C                                      |
| Solenoid                           | ≤ 50°C                                      |
| Position indicator: contact rating | 5 A / 250 V AC, 3 A / 50 V DC               |
| Solenoid                           | see tag on solenoid                         |

## 2 Installation

### 2.1 Installation into the system

#### Admissible forces

Forces from evacuating the system, from the weight of other components, and from baking can lead to deformation of the valve body and to malfunction of the valve. The stress has to be relieved by suitable means, e.g. bellows sections. The following forces are admissible:

| DN (nom. I.D.)  |      | Axial tensile or compressive force «FA» |     | Bending moment «M» |          |  |
|---|------|---|-----|--------------------|----------|---|
| mm  | inch | N                                       | lbf | Nm                 | lbf • ft |   |
| 63  | 2½   | 2000                                    | 448 | 80                 | 59       |   |
| 100   | 4    | 2500                                    | 560 | 100                | 74       |   |
| 160   | 6    | 3000                                    | 672 | 150                | 110      |   |
| 200   | 8    | 3000                                    | 672 | 150                | 110      |   |
| If a combination of both forces («FA» and «M») occurs, the values mentioned above are invalid. Please contact VAT for more information. |      |   |     |                    |          |   |

## 2.2 Connections

### 2.2.1 Compressed air connection



Connect compressed air only if  
 - valve has been installed into the vacuum system  
 - moving parts cannot be touched

With solenoid: Connect compressed air to **IN** (internal thread R 1/8", 1/8" NPT for USA)

Without solenoid: Connect compressed air to **OPEN** and **CLOSE** (internal thread 1/8")

Solenoid delivered separately:

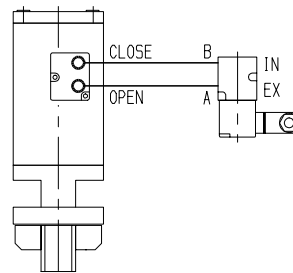
Compressed air connection on pneumatics cylinder:  
 Internal thread 1/8"

Remove 2 vent plugs from «A» and «B»

Compressed air to connection <A>:  
 Valve opens

Compressed air to connection <B>:  
 Valve closes

Compressed air pressure (min. - max. overpressure): 4 - 7 bar / 55 - 100 psig  
 Use only clean, dry or slightly oiled air!



### 2.2.2 Electrical connection



Do not touch electrical parts under voltage!

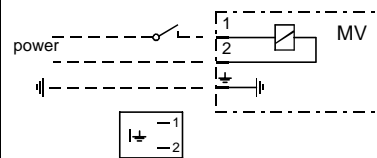


Connect electrical power only if  
 - valve has been installed into the vacuum system  
 - moving parts cannot be touched

Verify that mains voltage matches voltage stated on the solenoid! Sockets for position indicator and solenoid are supplied with the valve.

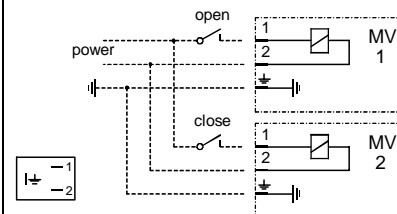
Wire solenoid and position indicator according to the following diagrams:

#### Standard solenoid



MV = coil of solenoid

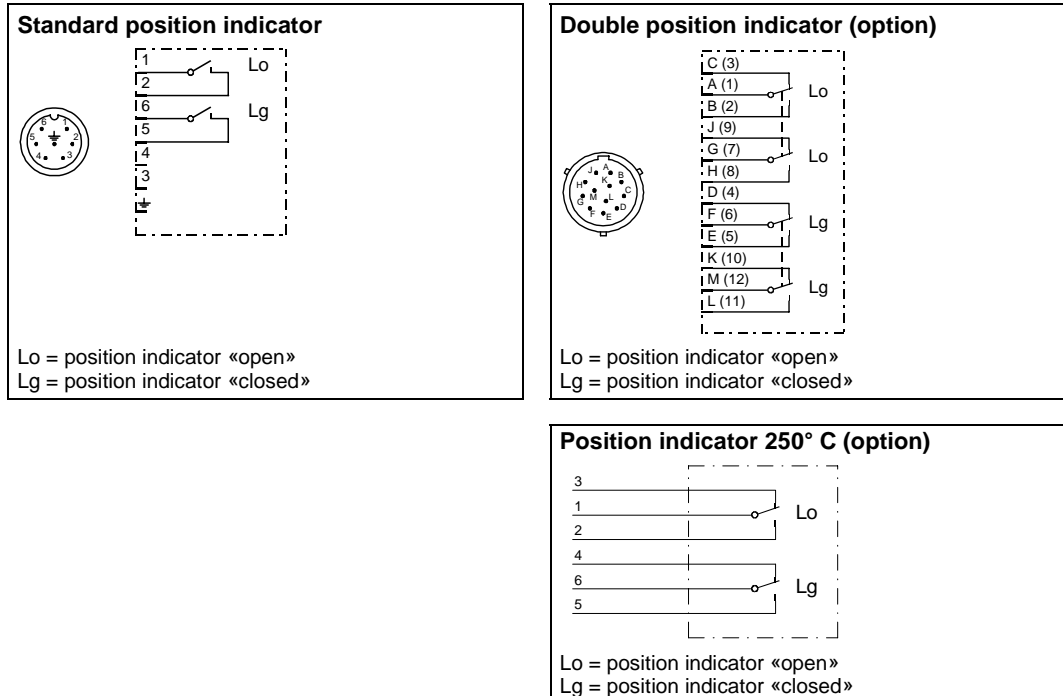
#### Solenoid for impulse actuation (option)



MV = coil of solenoid

Minimum pulse duration 50 ms

Continuous voltage does not damage the coil



## 3 Operation

### 3.1 Normal operation

Valve is opened and closed by means of compressed air.

### 3.2 Operation under increased temperature

See «1.1 Technical data»

### 3.3 Behavior in case of compressed air pressure drop

Valve closed: valve remains closed  
 Valve open: valve position is undefined

### 3.4 Behavior in case of power failure

Standard solenoid: valve closes

Solenoid for impulse actuation (option): valve position does not change, but a started movement will be completed

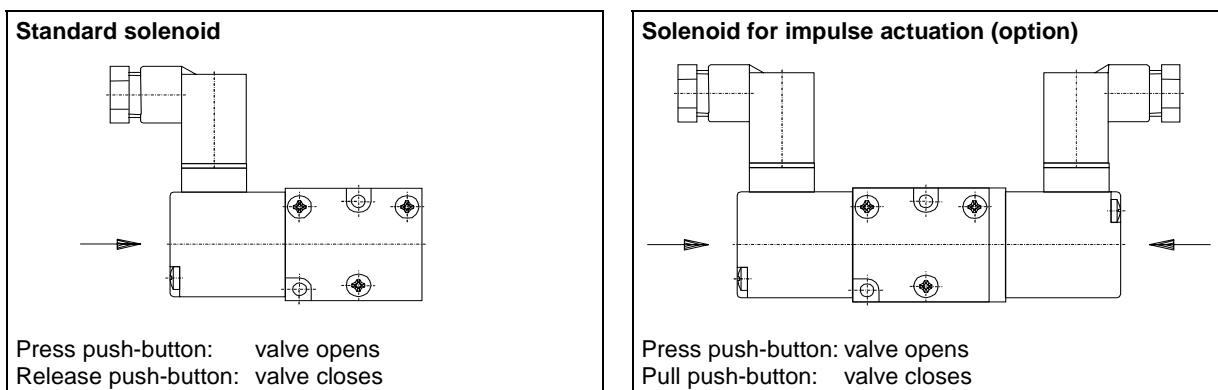
### 3.5 Behavior in case of other failures

Standard solenoid: valve closes

Solenoid for impulse actuation (option): valve position does not change, but a started movement will be completed

## Emergency operation at power failure

In case of a power failure, the valve can be actuated manually if compressed air is available.



## 4 Trouble shooting

Valve does not close/open: Power available?  
 Compressed air available?  
 Solenoid defective?  
 Check voltage!  
 Check air pressure!

Leak at gate: Clean valve seat and gate!  
 Replace gate, if damaged!  
 Correct air pressure?

Leak at body: Flanges leaktight?  
 Replace bonnet seal!

### Global leak at bonnet seal after heating the valve!

Due to a possible settlement of screw and VATSEAL it could happen that after a heat up and cool down procedure the bonnet seal becomes slight leaky. In this case please check the torque (see below) of bonnet screw (see page 8 item 61) and tighten the screws if necessary with a torque wrench.

Remark:  
 Do tight screws crosswise!  
 Necessary torque of screws is for  
 DN63, DN100 and DN 160; 20 Nm /15 lbf · ft.  
 DN200; 40 Nm / 30 lbf · ft.

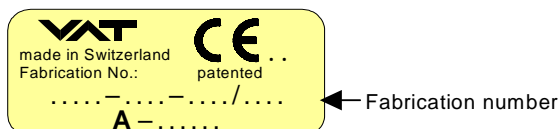
If you need any further information, please contact one of our service centers. You can find the addresses on our website:  
<http://www.vat.ch>



## 5 Maintenance & repairs

Under clean operating conditions, the valve does not require any maintenance during the specified cycle life. Contamination from the process may influence the function and requires more frequent maintenance.

Before carrying out any maintenance or repairs, please contact VAT. It has to be individually decided whether the maintenance/repair can be performed by the customer or has to be carried out by VAT. The fabrication number on the valve



has always to be specified.

All supplies (e. g. compressed air, electrical power) must be disconnected for removal/installation of the valve from/into the system and for maintenance work.



Even with disconnected supply, loaded springs and/or air cushions in cylinders can be potential hazards.



Keep fingers and objects away from the valve opening!

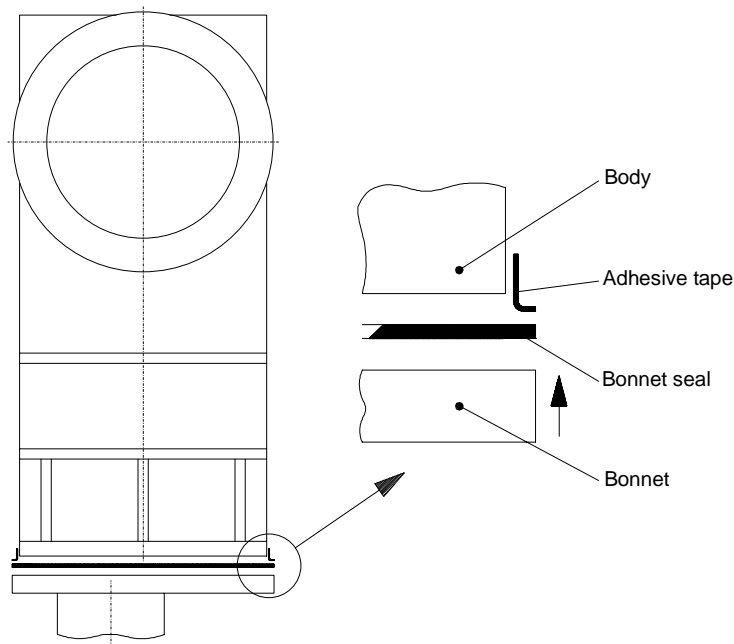
Products returned to VAT must be free of harmful substances such as e.g. toxical, caustic or microbiological ones. If products are radioactively contaminated, fill in the VAT form «Contamination and Radiation Report» and send it with the product. The form is available at VAT. The maximum values indicated in the form must not be exceeded.

## 5.1 Replacement of actuator / mechanism assembly

- Vent chambers and open valve
- Disconnect compressed air and electrical power from valve
- Remove bonnet screws (61) in crosswise order
- Withdraw actuator/mechanism assembly carefully from body
- Check and clean sealing surfaces of bonnet and valve seat
- Put new bonnet seal (60) on body or bonnet (depending on mounting position). If the actuator is directed downwards, proceed according to the following drawing:
- Reassemble in reverse direction

**Note!** Tighten screws in crosswise order!

Torque: DN 63 - 160 20 Nm / 15 lbf · ft  
 DN 200 40 Nm / 30 lbf · ft

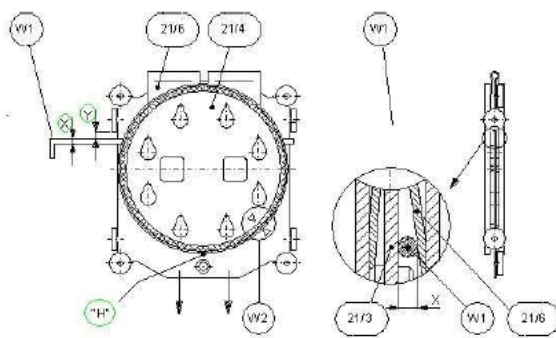
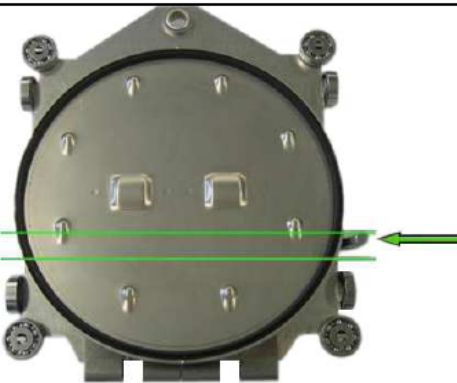
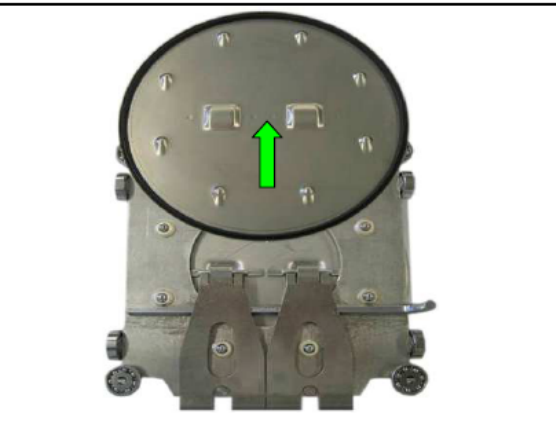










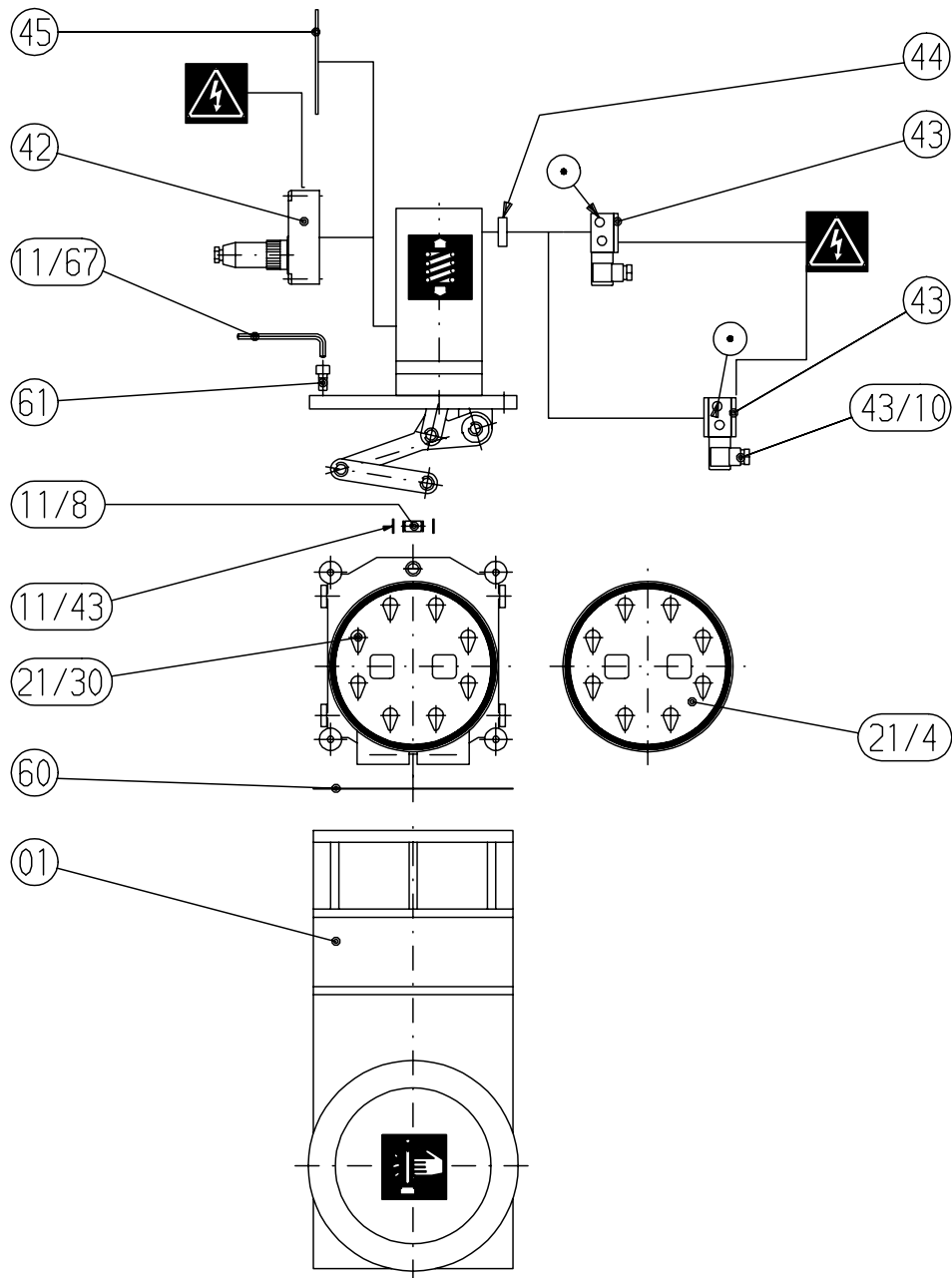
## 5.2 Replacement of gate

Remove actuator/mechanism assembly as described in the section «Replacement of actuator/mechanism assembly»

- Put mechanism into horizontal position to prevent the locking balls falling out
- Lift up valve plate manually at «H» and insert tool (W1) between spring (21/6) and ball guidance (21/3). Refer to figure 2.
- Remove gate (21/4) in direction of the arrow
- Insert new gate in reverse direction
- Remove tool (W1)
- Check whether gate is properly inserted. The markings  $\Delta$  and  $\nabla$  (W2) of ball guidance and gate must face each other.

|   |   |      |      |      |      |     |     |                  |  |   |   |   |    |   |    |     |     |     |     |      |      |      |      |      |   |    |     |     |     |      |      |     |     |      |      |
|---|--|------|------|------|------|-----|-----|------------------|--|---|---|---|----|---|----|-----|-----|-----|-----|------|------|------|------|------|---|----|-----|-----|-----|------|------|-----|-----|------|------|
| <p><b>1) Lift up the gate at „H“</b></p>  | <p><b>2) Insert Allen-key</b></p>  |      |      |      |      |     |     |                  |  |   |   |   |    |   |    |     |     |     |     |      |      |      |      |      |   |    |     |     |     |      |      |     |     |      |      |
|  | <table border="1"> <thead> <tr> <th>DN</th> <th>mm</th> <th>63</th> <th>100</th> <th>160</th> <th>200</th> </tr> </thead> <tbody> <tr> <td>Allen-key number</td> <td></td> <td>6</td> <td>6</td> <td>8</td> <td>10</td> </tr> <tr> <td rowspan="2"></td> <td>mm</td> <td>6.0</td> <td>6.0</td> <td>8.0</td> <td>5.0</td> </tr> <tr> <td>inch</td> <td>0.16</td> <td>0.16</td> <td>0.31</td> <td>0.20</td> </tr> <tr> <td rowspan="2"></td> <td>mm</td> <td>0.0</td> <td>0.0</td> <td>7.0</td> <td>10.0</td> </tr> <tr> <td>inch</td> <td>0.0</td> <td>0.0</td> <td>0.27</td> <td>0.40</td> </tr> </tbody> </table> | DN   | mm   | 63   | 100  | 160 | 200 | Allen-key number |  | 6 | 6 | 8 | 10 |  | mm | 6.0 | 6.0 | 8.0 | 5.0 | inch | 0.16 | 0.16 | 0.31 | 0.20 |  | mm | 0.0 | 0.0 | 7.0 | 10.0 | inch | 0.0 | 0.0 | 0.27 | 0.40 |
| DN  | mm   | 63   | 100  | 160  | 200  |     |     |                  |  |   |   |   |    |   |    |     |     |     |     |      |      |      |      |      |   |    |     |     |     |      |      |     |     |      |      |
| Allen-key number  |  | 6    | 6    | 8    | 10   |     |     |                  |  |   |   |   |    |   |    |     |     |     |     |      |      |      |      |      |   |    |     |     |     |      |      |     |     |      |      |
|  | mm   | 6.0  | 6.0  | 8.0  | 5.0  |     |     |                  |  |   |   |   |    |   |    |     |     |     |     |      |      |      |      |      |   |    |     |     |     |      |      |     |     |      |      |
|   | inch   | 0.16 | 0.16 | 0.31 | 0.20 |     |     |                  |  |   |   |   |    |   |    |     |     |     |     |      |      |      |      |      |   |    |     |     |     |      |      |     |     |      |      |
|  | mm   | 0.0  | 0.0  | 7.0  | 10.0 |     |     |                  |  |   |   |   |    |   |    |     |     |     |     |      |      |      |      |      |   |    |     |     |     |      |      |     |     |      |      |
|   | inch   | 0.0  | 0.0  | 0.27 | 0.40 |     |     |                  |  |   |   |   |    |   |    |     |     |     |     |      |      |      |      |      |   |    |     |     |     |      |      |     |     |      |      |
| <p><b>3) Remove seal plate</b></p>  | <p>Use the proper Allen-key size</p>   |      |      |      |      |     |     |                  |  |   |   |   |    |   |    |     |     |     |     |      |      |      |      |      |   |    |     |     |     |      |      |     |     |      |      |

## 6 Drawing



## 7 Spare parts

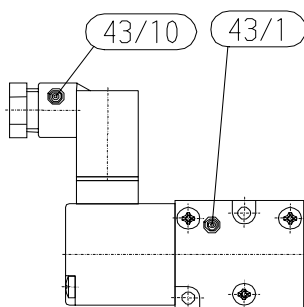


Please specify the **fabrication number of the valve** (see yellow label on valve) when ordering spare parts. This is to ensure that the appropriate spare parts are supplied.

| Item  | Description          | DN  | Part No. |
|-------|----------------------|-----|----------|
|       | Seal kit,            | 63  | 82484-R1 |
|       | Consisting of:       | 100 | 82485-R1 |
|       | - Gate /21/4)        | 160 | 82486-R1 |
|       | - Bonnet seal (60)   | 200 | 82487-R1 |
| 21/4  | Gate                 | 63  | 84065-R1 |
|       |                      | 100 | 80506-R1 |
|       |                      | 160 | 80510-R1 |
|       |                      | 200 | 79324-R1 |
| 21/30 | 1 Set of 8 pcs       | 63  | 331584   |
|       | locking balls 12 pcs | 100 | 331587   |
|       | 16 pcs               | 160 | 331589   |
|       | 16 pcs               | 200 | 329723   |
| 60    | Bonnet seal          | 63  | 63215-01 |
|       |                      | 100 | 63216-01 |
|       |                      | 160 | 93160-01 |
|       |                      | 200 | 63217-01 |

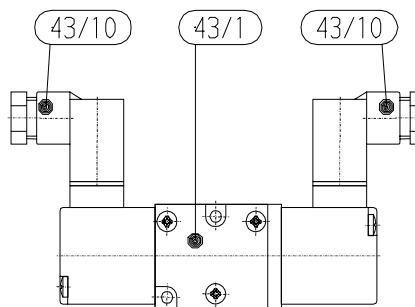
| Air connection kit (standard without solenoid) |                          |        |      |          |
|--|--------------------------|--------|------|----------|
| Item   | Description              | DN     | Qty. | Part No. |
| 44   | Pneumatic connection kit | 63-200 | 1    | 94827-R1 |

### Solenoid kit: (standard)



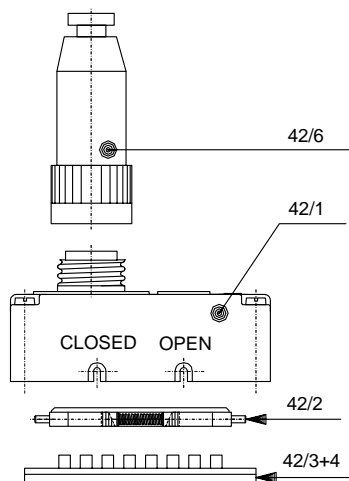
| Item  | Description  | Qty. | Part No.      |
|-------|--------------|------|---------------|
|       | Solenoid kit | 1    | 94800-R1      |
| 43/1  | Solenoid     | 1    | N-7557-018 *) |
| 43/10 | Plug         | 1    | N-8501-400    |

### Solenoid kit: impulse actuation (option)



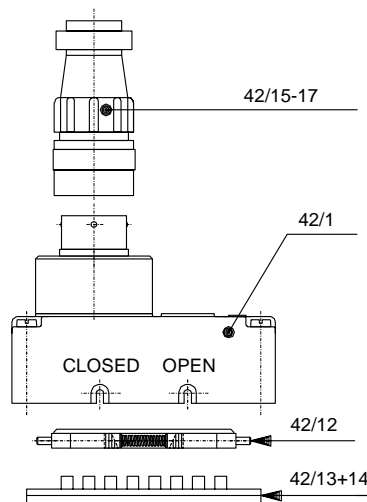
| Item  | Description  | Qty. | Part No.      |
|-------|--------------|------|---------------|
|       | Solenoid kit | 1    | 94801-R1      |
| 43/1  | Solenoid     | 1    | N-7557-021 *) |
| 43/10 | Plug         | 2    | N-8501-400    |

**Position indicator kit: open/closed (standard)**



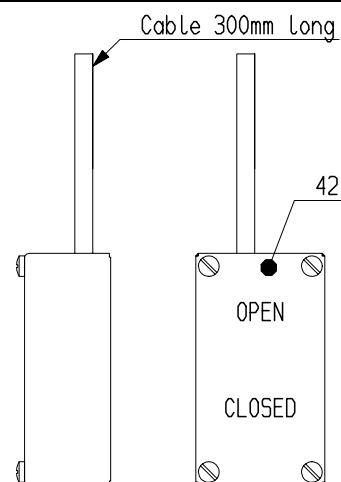
| Item | Description              | Qty. | Part No.   |
|------|--------------------------|------|------------|
|      | Position indicator DN 63 | 1    | 99305-R1   |
|      | kit DN 100               | 1    | 99306-R1   |
|      | DN 160                   | 1    | 81045-R1   |
|      | DN 200                   | 1    | 81045-R1   |
| 42/1 | Position indicator       | 1    | 73649-R1   |
| 42/2 | Slider                   | 1    | 73638-R1   |
| 42/3 | Strip                    | 1    | 70987-01   |
| 42/4 | Driving pin              | 2    | 70988-01   |
| 42/6 | Plug                     | 1    | N-8504-002 |

**Position indicator kit: open/closed with double position indicator (option)**



| Item  | Description            | Qty. | Part No.   |
|-------|------------------------|------|------------|
|       | Position indicator kit | 1    | 85304-R1   |
| 42/1  | Position indicator     | 1    | 85259-R1   |
| 42/12 | Slider                 | 1    | 73638-R1   |
| 42/13 | Strip                  | 1    | 70987-01   |
| 42/14 | Driving pin            | 2    | 70988-01   |
| 42/15 | Bushing                | 12   | N-E503-100 |
| 42/16 | Plug                   | 1    | N-E503-023 |
| 42/17 | Cable strain relief    | 1    | N-E503-043 |

**Position indicator kit 250° C (option)**



| Item | Size of valve | Qty. | Part No. |
|------|---------------|------|----------|
| 42   | DN 63         | 1    | 67484-R1 |
| 42   | DN 100        | 1    | 67483-R1 |
| 42   | DN 160        | 1    | 67482-R1 |
| 42   | DN 200        | 1    | 67482-R1 |



## **8 Warranty**

Each product sold by VAT Vakuumventile AG (VAT) is warranted to be free from the manufacturing defects that adversely affect the normal functioning thereof during the warranty period stated in VAT's «Terms of Sale» immediately following delivery thereof by VAT, provided that the same is properly operated under conditions of normal use and that regular, periodic maintenance and service is performed or replacements made, in accordance with the instructions provided by VAT. The foregoing warranty shall not apply to any product or component that has been repaired or altered by anyone other than an authorized VAT representative or that has been subject to improper installation or abuse, misuse, negligence or accident. VAT shall not be liable for any damage, loss, or expense, whether consequential, special, incidental, direct or otherwise, caused by, arising out of or connected with the manufacture, delivery (including any delay in or failure to deliver), packaging, storage or use of any product sold or delivered by VAT shall fail to conform to the foregoing warranty or to the description thereof contained herein, the purchaser thereof, as its exclusive remedy, shall upon prompt notice to VAT of any such defect or failure and upon the return of the product, part or component in question to VAT at its factory, with transportation charges prepaid, and upon VAT's inspection confirming the existence of any defect inconsistent with said warranty or any such failure, be entitled to have such defect or failure cured at VAT's factory and at no charge therefor, by replacement or repair of said product, as VAT may elect. VAT MAKES NO WARRANTY OR REPRESENTATION OF ANY KIND, EXPRESS OR IMPLIED, (INCLUDING NO WARRANTY OR MERCHANTABILITY), EXCEPT FOR THE FOREGOING WARRANTY AND THE WARRANTY THAT EACH PRODUCT SHALL CONFORM TO THE DESCRIPTION THEREOF CONTAINED HEREIN, and no warranty shall be implied by law.

Furthermore, the «Terms of sale» at the back of the price list are applicable.