

## Mini gate valve

### With pneumatic actuator, double acting

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

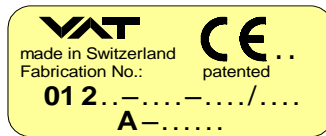
01224 - .A -....

01228 - .A -....

01232 - .A -....

01234 - .A -....

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!



Keep body parts and objects away from the valve opening!



Attention!



Hot surfaces; do not touch!



Product is in conformity with EC guidelines, if applicable!



Loaded springs and/or air cushions are potential hazards!



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



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 012, DN 16-50 (I.D. 5/8" - 2")**

---

**Imprint:**

**Manufacturer** VAT Vakuumventile AG, CH-9469 Haag, Switzerland

Website  
www.vatvalve.com

Phone  
+41 81 771 61 61

Fax  
+41 81 771 48 30

Email  
CH@vatvalve.com

**Publisher** VAT Vakuumventile AG, CH-9469 Haag, Switzerland

**Editor** VAT Vakuumventile AG, CH-9469 Haag, Switzerland

**Print** VAT Vakuumventile AG, CH-9469 Haag, Switzerland

**Copyright** © VAT Vakuumventile AG 2008

No part of these Instructions may be reproduced in any way (photocopies, microfilms or any other reproduction processes) nor may it be manipulated with electronic systems, duplicated or distributed without written permission from VAT. Offenders are liable to pay damages.

The original VAT firmware and updated state of the art versions of the VAT firmware are intended for use with VAT products. The VAT firmware contains a limited, time unlimited user license. The VAT firmware may not be used for purposes other than those intended nor is it permitted to make copies of the VAT firmware. In particular, it is strictly forbidden to give copies of the VAT firmware to other people.

The use of trade names, brand names, trademarks, etc. in these Instructions does not entitle third parties to consider these names to be unprotected and to use them freely. This is in accordance with the meaning of the laws and acts covering brand names and trademarks.



**Contents:**

|       |   |    |
|-------|---|----|
| 1     | Use of product.....                                   | 4  |
| 1.1   | Technical data.....                                   | 4  |
| 2     | Installation.....                                     | 4  |
| 2.1   | Unpacking.....  | 4  |
| 2.2   | Installation into the system.....                     | 4  |
| 2.3   | Admissible forces.....                                | 5  |
| 2.4   | Connections.....                                      | 5  |
| 2.4.1 | Compressed air connection.....                        | 5  |
| 2.4.2 | Electrical connection.....                            | 5  |
| 3     | Operation.....  | 6  |
| 3.1   | Normal operation.....                                 | 6  |
| 3.2   | Operation under increased temperature.....            | 6  |
| 3.3   | Behavior in case of compressed air pressure drop..... | 6  |
| 3.4   | Behavior in case of power failure.....                | 6  |
| 4     | Trouble shooting.....                                 | 7  |
| 5     | Maintenance & repairs.....                            | 7  |
| 5.1   | Replacement of Gate.....                              | 8  |
| 6     | Drawing.....  | 9  |
| 7     | Spare parts.....                                      | 9  |
| 8     | Warranty.....   | 11 |



## 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>-7</sup> mbar to 2 bar (abs) |
| Differential pressure on the gate     | ≤ 1 bar in either direction              |
| Max. Differential pressure at opening | ≤ 30 mbar                                |
| Admissible temperature: Valve body    | ≤ 100°C                                  |
| Pneumatic actuator                    | ≤ 50°C                                   |
| Position indicator                    | ≤ 80°C                                   |
| Solenoid                              | ≤ 50°C                                   |

The temperatures specified in the technical data are only admissible if the valve is in open or closed position. Operation of the valve during the bakeout cycle is prohibited.

|                                    |                            |
|------------------------------------|----------------------------|
| Position indicator: contact rating | 0.5 A / 50 V AC, max.10 W  |
|                                    | 0.5 A / 75 V DC, max. 10 W |
| Solenoid                           | see tag on solenoid        |

Further data according to VAT catalogue «Vacuum Valves 2008».

## 2 Installation

### 2.1 Unpacking

Make sure, that the delivered components are according the order.  
Visually check the quality of the components.  
If something of the delivery is not as expected please immediately contact VAT.

Notice:

Please do not throw away the original packaging. Packaging may be useful in a case of service to return the components to VAT.

### 2.2 Installation into the system

The valve seat side is indicated by the symbol "∇" on the connection flange.

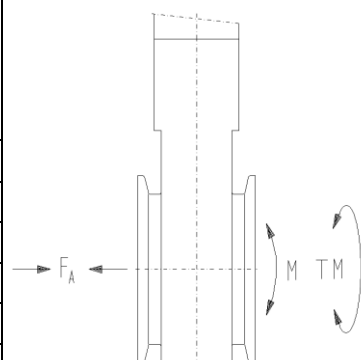
## 2.3 Admissible forces

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» |          | Maximum admissible torsional moment of body «TM» |          |
|----------------|------|---|-----|--------------------|----------|--|----------|
| mm             | inch | N                                       | lbf | Nm                 | lbf · ft | Nm   | lbf · ft |
| 16             | 5/8  | 295                                     | 66  | 12                 | 9        | -  | -        |
| 25             | 1    | 345                                     | 77  | 15                 | 11       | 175  | 129      |
| 40             | 1½   | 490                                     | 110 | 23                 | 17       | 820  | 604      |
| 50             | 2    | 590                                     | 132 | 29                 | 21       | -  | -        |

If a combination of forces («FA», «M» and «TM» and ) occurs, the values mentioned above are invalid. Please contact VAT for more information.

Attention: The stated maximum torsional moment «TM» is only valid for the valve equipped with the standard flange to flange dimension (see catalogue 2008 Dimension A)



## 2.4 Connections

### 2.4.1 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 M5)

Compressed air pressure (min. - max. overpressure): 4.5 - 7 bar / 65 - 100 psig

Use only clean, dry or slightly oiled air!

### 2.4.2 Electrical connection



Do not touch electrical parts under voltage!

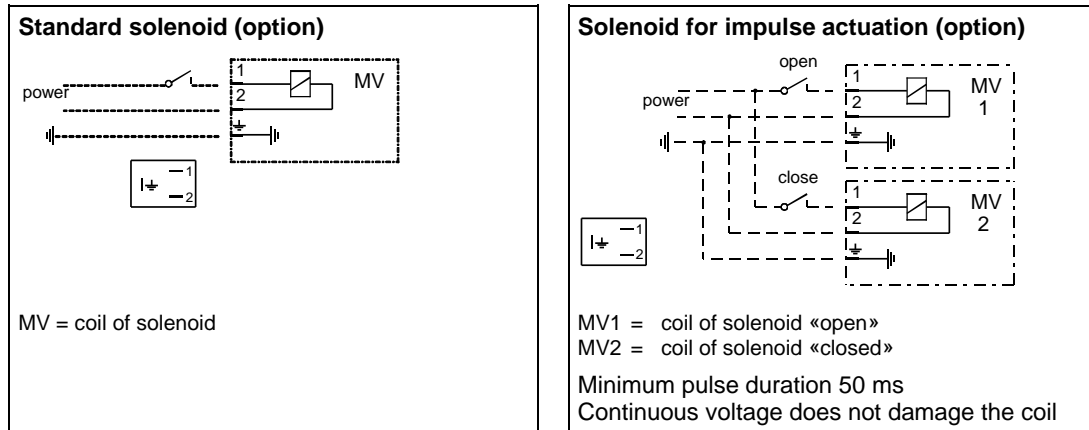


Connect electrical power only if

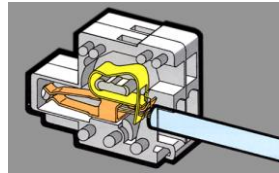
- valve has been installed into the vacuum system
- moving parts cannot be touched

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

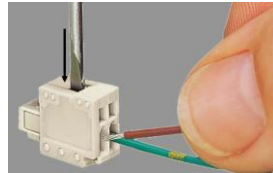
Wire solenoid and position indicator according to the following diagrams:



Connection of position indicator plug:



functional principle



connection



strain relief

## 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

Standard solenoid with adapter plate for «normally open»: Valve opens



## 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?

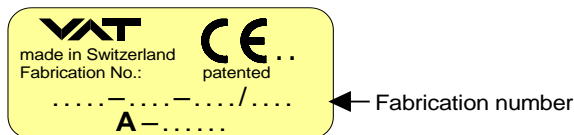
Leak at body: Flanges leaktight?  
Replace bonnet seal!  
Screws at bonnet tightened?

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.

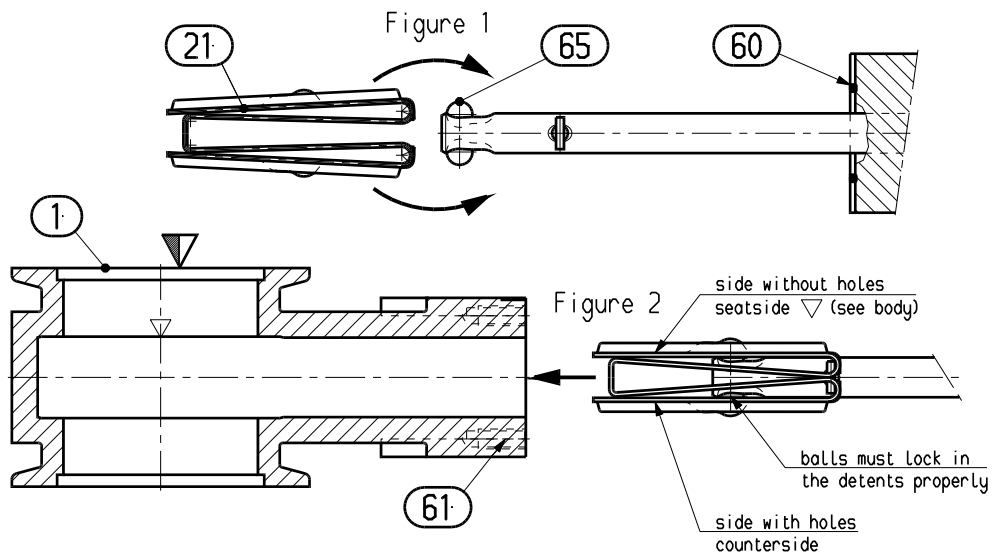


Keep fingers and objects away from the valve opening!

Products returned to VAT must be free of harmful substances such as e.g. toxic, 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.

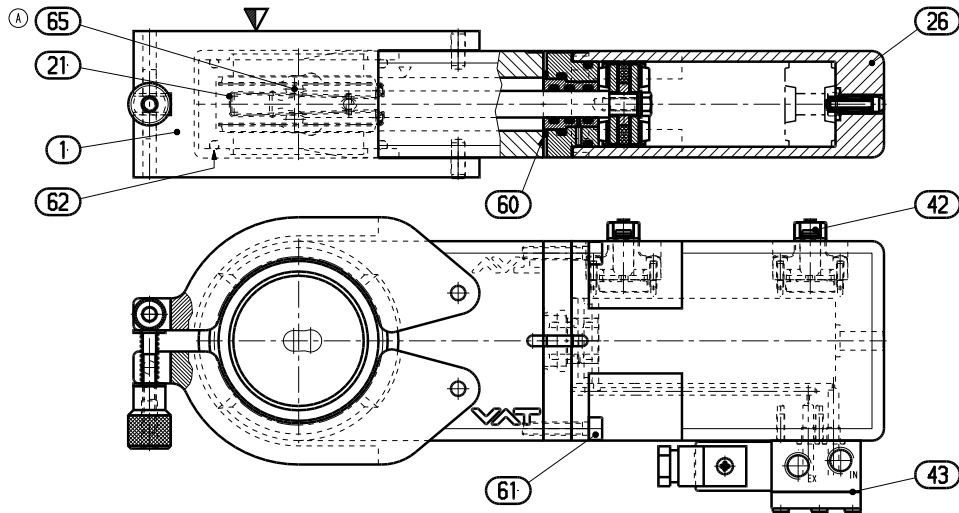
## 5.1 Replacement of Gate

1. Vent chambers on either side of valve
2. Open valve
3. Disconnect compressed air and electrical power from valve
4. Remove bonnet screws (61) in crosswise order
5. Withdraw actuator/mechanism assembly carefully from body  
**Attention:** Balls (65) can fall out!
6. Spread old gate (21) and remove it carefully (balls will fall out)
7. Put new balls (65) into detents of piston shaft and hold them with thumb and forefinger
8. Clip on new gate (21) (see figure 1)  
**Attention:** Check whether balls are inserted correctly in their detents
9. Check whether gate is inserted properly  
**Attention:** Seat side: marking «▽» on body (1)" and gate side without holes (see figure 2)
10. Check and clean sealing surfaces of bonnet O-ring and valve seat
11. Reassemble in reverse order  
**Attention:** Tighten screws (61) in crosswise order!  
 Torque: DN 16/25                      1 Nm / 0.74 lbf · ft





## 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                     | Qty. | VAT part number       |                       |                       |                       |
|------|---------------------------------|------|-----------------------|-----------------------|-----------------------|-----------------------|
|      |                                 |      | DN 16                 | DN 25                 | DN 40                 | DN 50                 |
|      | <b>Valve ordering number</b>    |      | <b>01224- . A . .</b> | <b>01228- . A . .</b> | <b>01232- . A . .</b> | <b>01234- . A . .</b> |
| 21   | Valve mechanism (stop included) | 1    | 202201                | 202200                | 202199                | 202198                |
| 65   | Pair of locking balls           |      |                       |                       |                       |                       |
| 42   | Position indicator              | 2    | 226699                | 226699                | 226699                | 226699                |
| 43   | Solenoid kit                    | 1    | 94800-R1              | 94800-R1              | 94800-R1              | 94800-R1              |
| 60   | Bonnet seal O-ring              | 1    | N-5100-019            | N-5100-026            | N-5100-031            | N-5100-033            |
| 62   | O-ring for ISO-KF quick         | 2    | N-5100-117            | N-5100-123            | N-5100-224            | N-5100-229            |

| Item | Description                    | Qty. | VAT part number     |                     |                     |                     |
|------|--------------------------------|------|---------------------|---------------------|---------------------|---------------------|
|      |                                |      | DN 16               | DN 25               | DN 40               | DN 50               |
|      | <b>Valve ordering number</b>   |      | <b>01224-KA . .</b> | <b>01228-KA . .</b> | <b>01232-KA . .</b> | <b>01234-KA . .</b> |
| 21   | Complete seal kit ISO-KF       | 1    | 92578-R1            | 92554-R1            | 92485-R1            | 92523-R1            |
| 60   |                                |      |                     |                     |                     |                     |
| 65   |                                |      |                     |                     |                     |                     |
|      | <b>Valve ordering number</b>   |      | <b>01224-BA . .</b> | <b>01228-BA . .</b> | <b>01232-BA . .</b> | <b>01234-BA . .</b> |
| 21   | Complete seal kit ISO-KF Quick | 1    | 96191-R1            | 96190-R1            | 96189-R1            | 96188-R1            |
| 60   |                                |      |                     |                     |                     |                     |
| 62   |                                |      |                     |                     |                     |                     |

|    |  |  |  |  |  |  |
|----|--|--|--|--|--|--|
| 65 |  |  |  |  |  |  |
|----|--|--|--|--|--|--|

**Solenoid kit**

| Item  | Description       | Qty. | Part No.      |
|-------|-------------------|------|---------------|
|       | Solenoid kit DN50 | 1    | 94800-R1      |
|       | Solenoid kit DN40 | 1    | 94800-R1      |
|       | Solenoid kit DN25 | 1    | 95080-R1      |
|       | Solenoid kit DN16 | 1    | 95081-R1      |
| 43/1  | Solenoid          | 1    | N-7557-018 *) |
| 43/10 | Plug              | 1    | N-8501-400    |

**Solenoid kit: impulse actuation**

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

..... \*) **Specify voltage!**  
 (e.g. N-7557-018-**220V 50Hz**)

**Position indicator: open or closed**

| Item | Description                  | Qty. | Part No. |
|------|------------------------------|------|----------|
|      | Position indicator           | 1    | 226699   |
| 42/3 | Plug including crimping pins | 1    | 227450   |



## 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.