

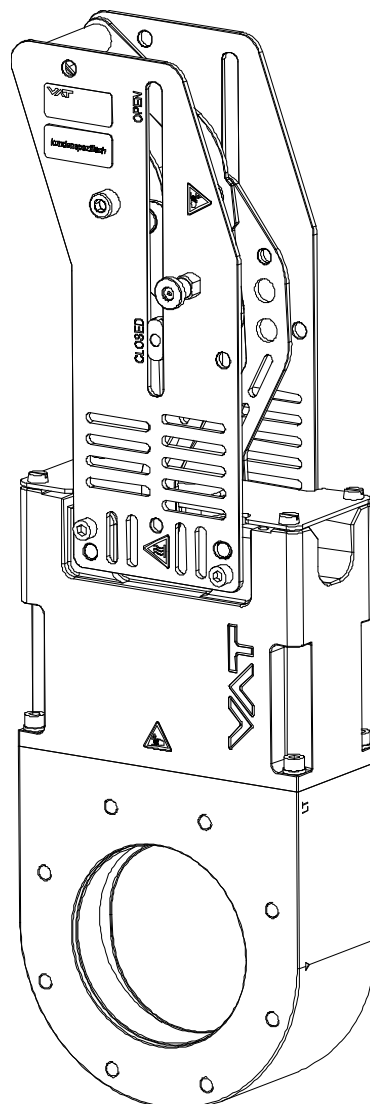
# Original installation, operation & maintenance instruction

---



## Series 092 HV Gate valve with manual actuator

DN 100 - 160 (4" - 6")



## Publication details

### Manufacturer

VAT Vakuumventile AG, CH-9469 Haag, Switzerland

Website: [www.vatvalve.com](http://www.vatvalve.com)

Phone: +41 81 771 61 61

Fax: +41 81 771 48 30

E-mail: [CH@vatvalve.com](mailto:CH@vatvalve.com)

© VAT Vakuumventile AG 2023

No part of these instructions may be reproduced in any way (photocopies, microfilms or any other method of reproduction) nor may it be duplicated or distributed using electronic systems without written permission from VAT.

Infringements shall be liable for 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 an unlimited number of user licenses. The VAT firmware may only be used for the permitted purposes. The creation of copies of the VAT firmware is allowed. It is however strictly forbidden to give copies of the VAT firmware to other people.

The use of trade names, brand names and trademarks in these instructions does not entitle third parties to consider these names to be unprotected. This is in line with legislation relating to brands, names and trademarks.

© 2023 All contents, in particular texts, photographs and graphics, are protected by copyright. VAT Vakuumventile AG reserves all rights, including reproduction, publication and translation.

# List of contents

<b>1</b>	<b>General information .....</b>	<b>5</b>
1.1	Scope of delivery .....	5
1.2	Other applicable documents .....	5
1.3	Typographical conventions.....	5
1.3.1	Important information .....	5
1.3.2	Danger levels .....	5
1.4	Forwarding .....	6
1.5	Document number and index .....	6
<b>2</b>	<b>Safety .....</b>	<b>7</b>
2.1	Intended use and purpose.....	7
2.2	Predictable misuse and improper use.....	7
2.3	Personal protective equipment.....	7
2.4	End user's obligations .....	7
2.5	Staff obligations .....	8
2.6	Damage to the product.....	8
2.6.1	Electrostatic discharge.....	8
2.6.2	Product contamination .....	8
2.6.3	Hazardous materials .....	8
2.6.4	Sealant sticking .....	8
2.7	Product handling .....	9
2.7.1	Moving parts.....	9
2.7.2	Unsuitable packaging.....	9
<b>3</b>	<b>Technical data.....</b>	<b>10</b>
<b>4</b>	<b>Design and function .....</b>	<b>11</b>
4.1	Type label.....	11
4.2	Principle of operation.....	11
4.3	Valve structure .....	12
<b>5</b>	<b>Installation.....</b>	<b>13</b>
5.1	Unpacking .....	13
5.2	Mounting valve .....	13
<b>6</b>	<b>Operation.....</b>	<b>16</b>
6.1	Response in operation .....	16
6.2	Operation under increased temperature .....	17
<b>7</b>	<b>Troubleshooting .....</b>	<b>18</b>
7.1	Error table.....	18
<b>8</b>	<b>Maintenance .....</b>	<b>19</b>
8.1	Dismantling valve body .....	19
8.2	Changing valve gate O-ring .....	20
8.3	Changing gliders .....	21
8.4	Mounting valve insert .....	22

---

<b>9 Repair and service</b> .....	<b>23</b>
9.1 Fixed Price Refurbishment .....	23
<b>10 Dismantling and storage</b> .....	<b>24</b>
10.1 Remove valve.....	24
10.2 Store valve.....	24
<b>11 Transport packaging and shipping</b> .....	<b>25</b>
11.1 Packing and transporting the valve .....	25
11.2 Sending returns .....	25
<b>12 Consumable and spare parts</b> .....	<b>26</b>
12.1 Overview of spare parts .....	26
12.2 Overview of auxiliary devices .....	26
<b>13 Disposal</b> .....	<b>27</b>
13.1 Disposal.....	27
13.2 Hazardous materials.....	27

# 1 General information

This document contains the original Assembly and Operating Instructions (AOI).

## 1.1 Scope of delivery

The scope of delivery corresponds to your purchase order with VAT Vakuumventile AG. When you receive your purchase order, check it against your order list. If you find discrepancies between what was ordered and delivered, contact VAT Vakuumventile AG. Publication details [▶ 2]

The scope of delivery of your purchase order always includes the ordered product, the assembly and operating instructions and the safety data sheet.

## 1.2 Other applicable documents

The following documents belong to the product and must be observed:

- Product data sheet
- Product drawings
- Programmers Reference





## 1.3 Typographical conventions

### 1.3.1 Important information

 This icon indicates important and useful information.

### 1.3.2 Danger levels

To avoid injury and equipment damage, you must observe the warning and safety information in the instructions. The warnings describe the following danger levels:

	<p style="text-align: center;"><b>⚠ DANGER</b></p> <p>Situations which, if not avoided, will lead directly to death or serious injury.</p>
	<p style="text-align: center;"><b>⚠ WARNING</b></p> <p>Situations which, if not avoided, could lead to death or serious injury.</p>
	<p style="text-align: center;"><b>⚠ CAUTION</b></p> <p>Situations which, if not avoided, could lead to moderately serious or slight injury.</p>
	<p style="text-align: center;"><b>NOTICE</b></p> <p>Situations which, if not avoided, could lead to equipment damage.</p>

## 1.4 Forwarding

This document is part of the product and if the product is forwarded, the document must also be forwarded to the product recipient.

If the product becomes part of a machine as a result of installation on or combination with other parts, or by another method, this document must also be forwarded when the machine is sold. The only circumstance in which forwarding is not required is if all relevant parts of this document are included in the documentation accompanying the new machine. In the two latter cases, the machine manufacturer, not the manufacturer of this product, is legally responsible for the safety and for the content and scope of the instructions accompanying the machine.

## 1.5 Document number and index

The cover sheet includes the document number and indexing as well as the product definition and document type. The document number consists of at least 6 and at most 7 numbers. The index consists of 2 letters.

### Example:

1234567DA

The document number allows the documentation to be assigned to the product. The index indicates the language and version.

Version Language	A	B	C	D	E	F	G	...
German	DA	DB	DC	DD	DE	DF	DG	D...
English	EA	EB	EC	ED	EE	EF	EG	E...

## 2 Safety

### 2.1 Intended use and purpose


This gate valve is a plate-sealed, manually operated gate valve for HV applications. The gate separates different vacuum areas from each other. The gate valve has a visual position indicator for the positions Open and Close. It is particularly suitable for vacuum pump isolation in high vacuum applications. For the gate valve to achieve its maximum lifetime, the gate valve should be used for clean and dry vacuum applications according to the data sheet.

- The product is intended solely as a component for further use in a commercial context.
- The product may only be operated under the technical conditions described in the product data sheet.
- The product may only be operated under the environmental conditions described in the product data sheet.
- Examine the product prior to use and never operate if visibly damaged.
- Never technically modify the product.
- Never operate the product if it has not been completely installed.





### 2.2 Predictable misuse and improper use

Any use of the product that does not comply with the intended use, be this intentional or negligent, is forbidden by the manufacturer.

### 2.3 Personal protective equipment

 Personal protective equipment is not included in the scope of delivery.

To ensure the product is not contaminated or damaged, VAT recommends that the end user provides at least the following personal protective equipment for work with and on the product. If further protective clothing is required as a result of a special use of the product, the end user is responsible for making this known.

	Wear antistatic shoes
	Wear protective clothing
	Use gloves
	Use a hairnet

### 2.4 End user's obligations

The end user of the system is responsible for observing the safety regulations. Unqualified staff working on the product or located in danger zones can cause risks that could lead to serious injury.

- Have all activities carried out by qualified staff.
  - Qualified staff are those people authorized to operate devices, systems and electrical circuits in accordance with safety standards.

- Keep unqualified staff away from danger zones.
- Make sure that everybody who works on or with the product has read and understood the document.
- Make sure that safety information is observed.
- File this document together with the documentation of the entire system and ensure that it can be accessed at all times.
- This document is part of the product and must be forwarded together with the product.
- Note the relevant accident protection regulations and the recognized local safety rules.
- Provide the necessary personal protective equipment.
- Provide possibilities for ESD measures.

## 2.5 Staff obligations

To avoid equipment damage and injury when handling the product, staff are obliged to:

- ▶ Read the operating instructions and in particular follow the safety information.
- ▶ Note the relevant accident protection regulations and the other generally recognized safety rules.
- ▶ Wear the necessary personal protective equipment.

## 2.6 Damage to the product


### 2.6.1 Electrostatic discharge

Electrostatic discharge can cause injury and can damage electronic parts of the product.

- ▶ Provide counter measures to prevent Electrostatic Discharge (ESD) damage to control valve electronics.
- ▶ Carry out all work on the control and actuation unit under ESD-protected conditions.

### 2.6.2 Product contamination

To ensure correct operation of the product, the product must be protected from contamination.

 Personal protective equipment is not included in the scope of delivery.

- ▶ When working on and with the product, wear clean-room gloves.

### 2.6.3 Hazardous materials

Improper handling of hazardous materials can cause injury and harm the environment.

- ▶ Remove, for example, any toxic, corrosive or microbiological hazardous materials before you send the product to VAT.
- ▶ Dispose of the product correctly; see section Disposal [▶ 27].


### 2.6.4 Sealant sticking

Raised temperatures in the range from room temperature to the maximum permissible temperature may cause the plate seal to stick on the seat. This may cause damage to the seal or it may cause the valve to fail. It is advisable to bake out in an open position or to open the valve after it has heated up, even when hot.

If FFKM seals are used, the valve must be opened after heating up, even when hot.



## 2.7 Product handling

 The default value can differ depending on the customer specification and firmware.

### 2.7.1 Moving parts

Moving parts of the product can cause serious injury.


- ▶ Make sure that moving parts cannot be touched.
- ▶ Make sure that the opening is free as soon as the product is connected to a supply line.
- ▶ Do not connect the product to the supply line until it has been completely installed.

### 2.7.2 Unsuitable packaging

Unsuitable packaging material can cause product contamination.

- ▶ Keep the original packaging material.
- ▶ Use the original packaging material during transport and storage.
- ▶ Handle the product with care.

### 3 Technical data

 See supporting documentation, product data sheet.

## 4 Design and function

### 4.1 Type label

The article and serial number and the order number are indicated on the product or on a type label.

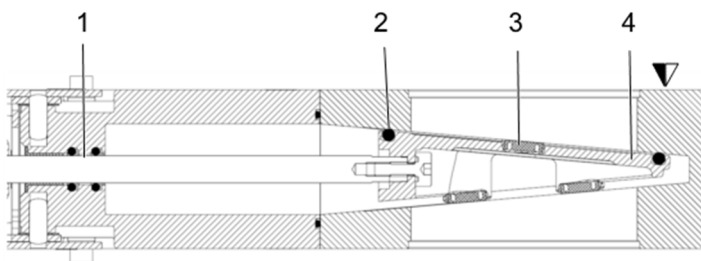


- 1 Article and serial number
- 2 Order number

### 4.2 Principle of operation

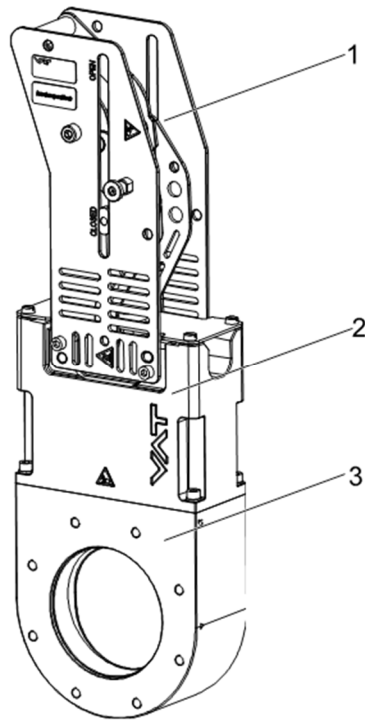
The valve sealing principle is based on a wedge shape gate design. The gate seal [3] is pressed against the sealing surface by means of a manual actuator. The valve is equipped with a shaft feedthrough [4].

The valve is operated by lifting of the manual drive (with an unlocked safety pin).



- 1 Feedthrough
- 2 Gate seal
- 3 Slide piece
- 4 Gate
- ▽ Valve seat side

### 4.3 Valve structure





- 1 Manual actuator
- 2 Upper valve body

- 3 Lower valve body

## 5 Installation


### 5.1 Unpacking


 If the product or the packaging is damaged in any way, take a photograph of the damage and the type label and report the damage to the VAT service center.


 Use a blunt object to open the plastic bag.


1. Make sure that the protective sleeves are not damaged.
2. Remove the packaging material.
3. Check whether the product is damaged. If it is, report this to VAT.
4. Lift the product out of the packaging.

### 5.2 Mounting valve

	<b>⚠ WARNING</b>
	<p><b>Moving parts</b> Body parts can be trapped or severely injured.</p> <ul style="list-style-type: none"> <li>▶ Only connect electrical current and compressed air once the product is completely installed in the system.</li> </ul>

	<b>⚠ CAUTION</b>
	<p><b>Danger of crushing as a result of unintended movement!</b> Crushing of the fingers.</p> <ul style="list-style-type: none"> <li>▶ Do not connect the compressed air supply until the assembly has been completely finished.</li> </ul>

	<b>NOTICE</b>
	<p><b>Leak due to incorrect handling of the sealing surfaces!</b> Leakage at the sealing surfaces.</p> <ul style="list-style-type: none"> <li>▶ Get qualified staff to install the product in the vacuum system.</li> </ul>

	<b>NOTICE</b>
	<p><b>Contamination of the product!</b> A contaminated product will lead to contamination in the vacuum system.</p> <ul style="list-style-type: none"> <li>▶ Wear the necessary personal protective equipment when working on the product.</li> </ul>

	NOTICE
	<p><b>Inappropriate tools</b> Sealing surfaces may get damaged. Do not use sharp-edged tools.</p>

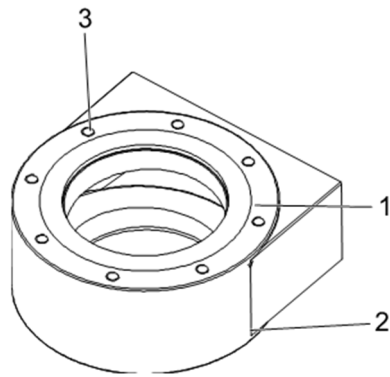
	NOTICE
	<p><b>Wrong tightening torque</b> Valve body and screws may get damaged. Use tightening torque according the size of the screws.</p>

The mounting aid is not included in the scope of delivery.

DN		Maximum screw-in depth G in mm for flange type
mm	Inch	ISO-F
100	4	12
160	6	15

DN		Tensile and compressive force FA		Torque M		
mm	Inch	N	lbf	Nm	Lbs. ft	
100	4	1080	242	49	36	
160	6	3000	674	150	110	

If both forces ("FA" and "M") occur together, the specified values are invalid. In this case, VAT must be contacted.



1 Flange A side

3 Screw hole

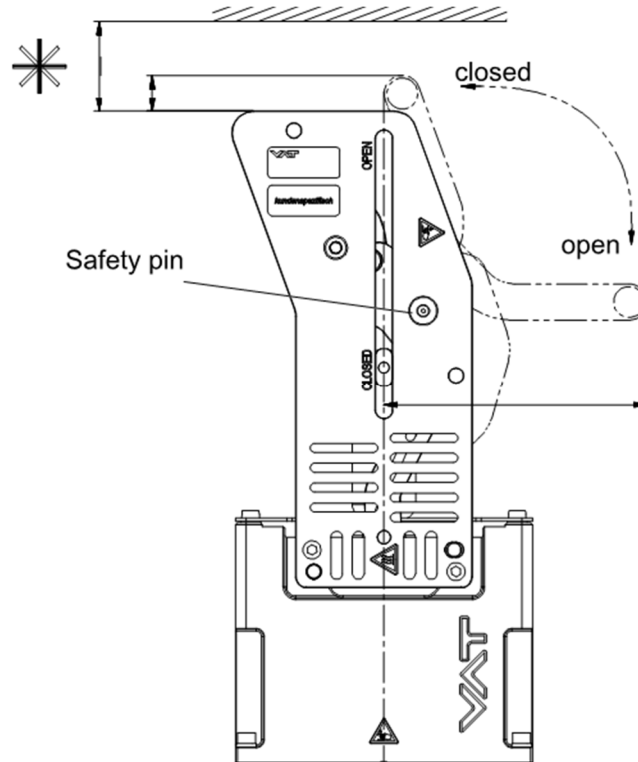
2 Flange B side

1. Remove protective covers from body flanges.
2. Clean sealing surfaces and seals of both flanges; see [1] and [2]. The valve seat side is marked with the symbol ▼ on flange A [1].
3. Lift valve to the mounting position.
4. Mount screws [3] evenly in crosswise order until the seal touches the sealing surface.
5. Tighten all screws with the torques appropriate for their property classes.

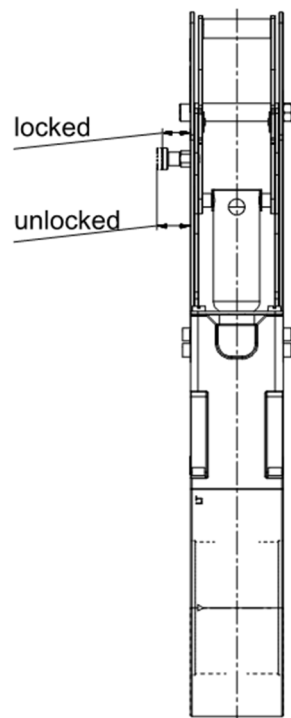
## 6 Operation

### 6.1 Response in operation

During operation, the opening and closing of the valve are regulated via the manual drive.




The safety pin needs to be unlocked during operation of the valve.





## 6.2 Operation under increased temperature

<b>⚠ CAUTION</b>	
	<p><b>Hot Valve</b></p> <p>Heated valve may result in minor or moderate injury.</p> <p>Do not touch valve and heating device during operation. Once heating is switched off (valve and system) await until the valve is cooled down complete before doing any work.</p>

This valve may be operated in the temperature range described in the product data sheet.

## 7 Troubleshooting

### 7.1 Error table

Error	Source	Error elimination	Section
Valve does not close / open	Actuator locked	Check if safety pin is unlocked	Response in operation [▶ 16]
Leak at gate	Seal damaged	replace the seal	Change seal
Leak at gate	Gate contaminated	Clean gate	Use a lint- and dust-free cloth
Leak at body	Bonnet seal and sealing surface all right	Clean sealing surface, if necessary, replace bonnet seal	Dismantling valve body

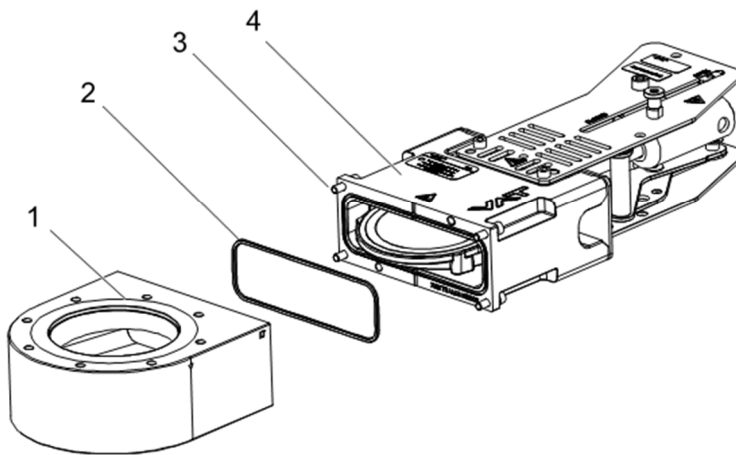
## 8 Maintenance

The maintenance intervals should be observed to ensure that the product works reliably throughout its lifetime. The type of application may make it necessary to shorten the maintenance intervals. In this case, the maintenance schedule must be adjusted accordingly.

In addition to the maintenance interval, the VAT Service Center also offers other services.

If you require further information about the maintenance intervals or services, please contact VAT.

### 8.1 Dismantling valve body



1 Valve body

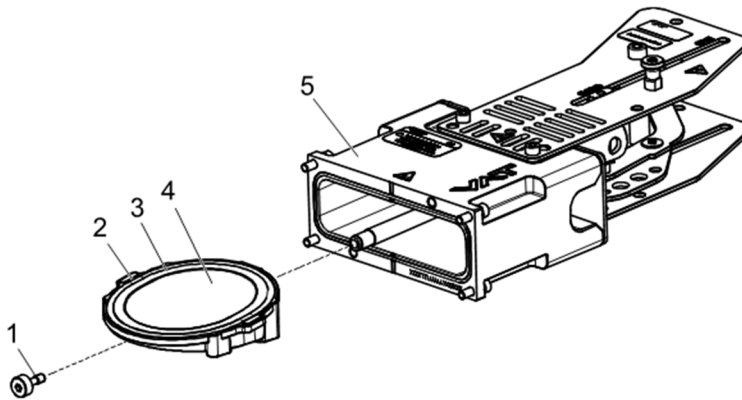
2 Bonnet seal

3 Screws

4 Valve insert

1. Open the valve.
2. Vent chambers on either side of the valve to atmospheric pressure.
3. Remove screws [3].
4. Pull the valve insert [4] from valve body [1].
  - ⇒ The valve body is open.

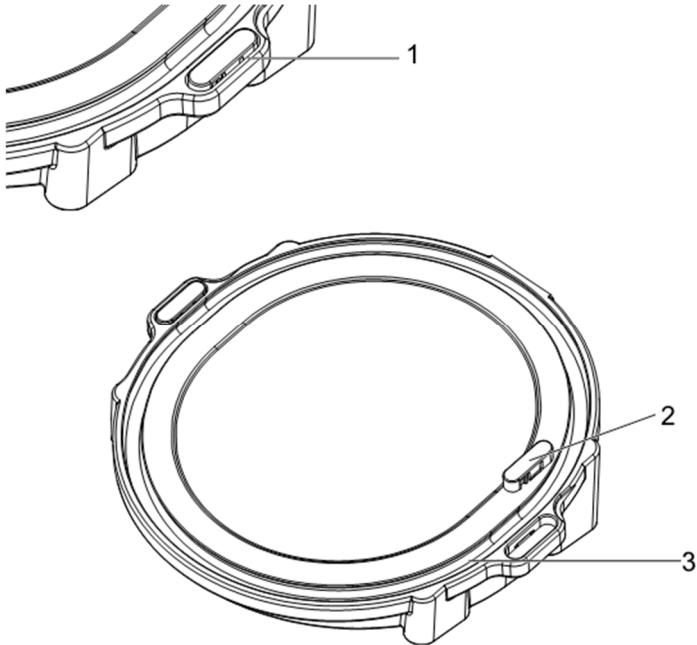
## 8.2 Changing valve gate O-ring



- |               |                |
|---------------|----------------|
| 1 Gate screw  | 4 Gate         |
| 2 Glider      | 5 Valve insert |
| 3 Gate O-ring |                |

- ✓ The valve insert is separate.
- ✓ The gate is set to closed position.
- 1. Disassemble gate [4] by unmounting the gate screw.
- 2. Clean gate sealing surfaces (seat side) and other surfaces inside valve body.
- 3. Clean or replace the gate O-ring [3], use O-ring removal tool.
- 4. If necessary, replace the gliders, see Changing gliders [▶ 21].
- 5. Clean or replace bonnet seal, see picture Dismantling valve body [▶ 19].
- 6. Mount gate [4] with the gate screw. Tightening torque DN 100 = 9 Nm, DN 160 = 21 Nm.
  - ⇒ The gate O-ring is changed.

### 8.3 Changing gliders



1 Gap between glider and gate

3 Gate

2 Glider

✓ The valve body is open.

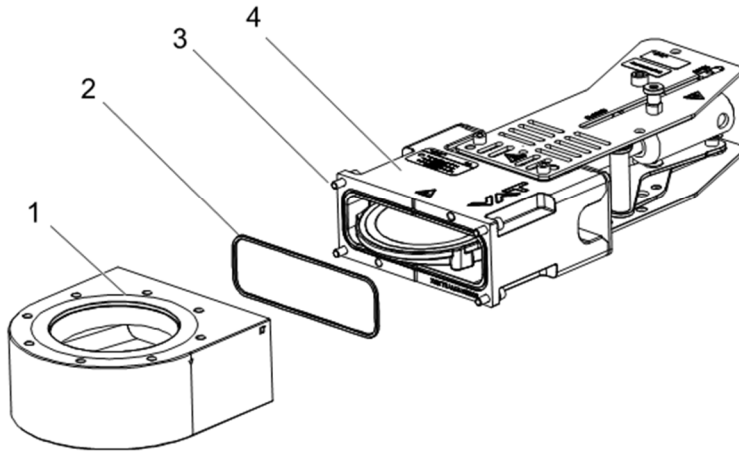
✓ The gate is set to closed position.

1. Remove gliders [2] from the front and backside of the gate [3] with a small, edge shaped tool e.g. screwdriver. Squeeze tool into gap between glider and gate [1]. Push down the tool to release glider from pocket and remove glider.

2. Mount the gliders [2] by gently pushing the gliders in the designated pockets in the gate.

⇒ The gliders are changed.

## 8.4 Mounting valve insert



1 Valve body

2 Bonnet seal

3 Screws

4 Valve insert

- ✓ The valve insert is open.
  - ✓ The gate is set to open position.
  - 1. Mount valve insert [4] into the valve body [1]. Assure that the gate O-ring is facing the valve body seat side marker ▼.
  - 2. Mount screws [3]. Tightening torque DN 100 = 6 Nm, DN 160 = 14 Nm.
  - 3. Reinstall the valve into the system.
- ⇒ Valve is ready for use.

## 9 Repair and service

1. Have repairs carried out by VAT service personnel.
2. Only carry out repairs yourself if you have first consulted VAT.
3. Contact a VAT service center, see [www.vatvalve.com](http://www.vatvalve.com).

### 9.1 Fixed Price Refurbishment


During the Fixed Price Refurbishment (FPR), the VAT customer service can refurbish the product or individual components for you. Consumable parts are replaced, and the guarantee on the replaced parts is extended.


1. Select the desired service from our comprehensive FPR service program for the refurbishment.
2. Contact your assigned sales person or the nearest VAT service center to learn about the options for the product in question. [VAT Service Center](#).

## 10 Dismantling and storage

### 10.1 Remove valve

	<b>⚠ WARNING</b>
	<p><b>Danger of burns from hot valve surface!</b>          Serious burns on the skin.</p> <p>▶ Let the system cool down before you perform work on it.</p>

	<b>⚠ WARNING</b>
	<p><b>Environmental pollution through harmful substances!</b>          Incorrect disposal leads to environmental pollution.</p> <p>▶ Dispose of products and parts in accordance with the local regulations.</p>

	<b>⚠ CAUTION</b>
	<p><b>Risk of injury due to unknown operating state!</b>          If the operating state is unknown, the product behavior cannot be predicted.</p> <p>▶ Disconnect all supply lines.</p>


1. Remove the valve.
- ⇒ The valve is dismantled.

### 10.2 Store valve

1. Clean and decontaminate the valve.
2. Cover all valve openings with a protective cap.
3. Pack the valve in the original packaging material.
4. Store the valve at the permitted environmental conditions, see the product data sheet.



## 11 Transport packaging and shipping

	<b>⚠ WARNING</b>
	<p><b>Environmental pollution through harmful substances!</b> Incorrect disposal leads to environmental pollution.</p> <ul style="list-style-type: none"><li>▶ Dispose of products and parts in accordance with the local regulations.</li></ul>

### 11.1 Packing and transporting the valve

1. Close the valve.
2. Cover all valve openings with a protective cap.
3. Pack the valve in the original packaging material.
4. Transport the valve in the original packaging only.

### 11.2 Sending returns

The end user is responsible for decontaminating the products and may only send decontaminated products back to VAT. When products are sent back to VAT, the declaration regarding chemical contamination must be completed and sent to VAT beforehand.

If contaminated products are sent to VAT, VAT will perform a decontamination process at the cost of the customer. The party sending the products is responsible for ensuring that the valve is sent in appropriate packaging.

- You can download the declaration form regarding chemical contamination of vacuum valves and valve components from the following website: <http://www.vatvalve.com>.
- Fill out the form and send it in advance to VAT or the relevant sales company.
- If the product is radioactively contaminated, ask VAT for the following form: Notification of contamination and radiation.

If you have any questions regarding the issue of decontamination and shipping, consult your VAT service center or the relevant sales company.

## 12 Consumable and spare parts

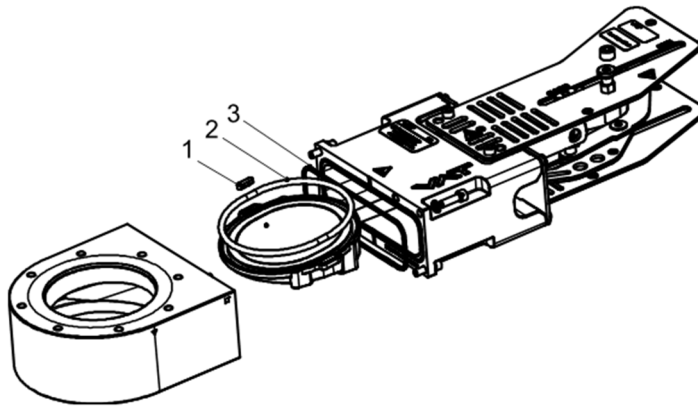
If you wish to order spare or consumable parts, have the article and serial numbers of the product on hand. This ensures you receive the right spare parts. The article and serial number are found on the Type label [▶ 11].

**i** VAT offers a wide range of spare parts and consumable parts.

Contact your assigned sales person or the nearest service center to learn about the options for the product in question.

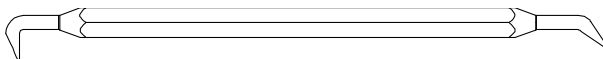
NOTICE	
	<p><b>Non-original spare parts and consumable parts!</b></p> <p>If you use non-original spare parts and consumable parts, you may damage the product.</p> <p>▶ Only use original spare parts and consumable parts from VAT.</p>

### 12.1 Overview of spare parts




Position	Description	Quantity per valve	Part number
1	Glider (part of the sealkit)	2	On request
2	Gate o-ring (part of the sealkit)	1	On request
3	Bonnet flange O-ring (Lower / upper body O-ring) (part of the sealkit)	1	On request

### 12.2 Overview of auxiliary devices



Description	Part number
O-ring removal tool	234859

## 13 Disposal

	<b>⚠ WARNING</b>
	<p><b>Environmental pollution through harmful substances!</b> Incorrect disposal leads to environmental pollution.</p> <ul style="list-style-type: none"><li>▶ Dispose of products and parts in accordance with the local regulations.</li></ul>

### 13.1 Disposal

The product and its components are made of various materials, which must be disposed of correctly.

1. Dispose of the product and its components in accordance with local regulations.
2. Hire an authorized contractor to dispose of your waste in the proper manner and in accordance with environmental requirements.

### 13.2 Hazardous materials

You can use the list below to identify the materials and dispose of them correctly:

- Non-ferrous metals
- Stainless steel
- Aluminum
- Plastic
- Lubricating agents
- Electronic waste
- Batteries
- Cables and lines
- Motors
- Seals and rubber parts

Find out more and connect to your  
local VAT contact on

[WWW.VATVALVE.COM](http://WWW.VATVALVE.COM)

VAT Vakuumentile AG  
(Headquarters)  
Seelistrasse 1  
9469 Haag

