

Installation, Operating & Maintenance Instructions

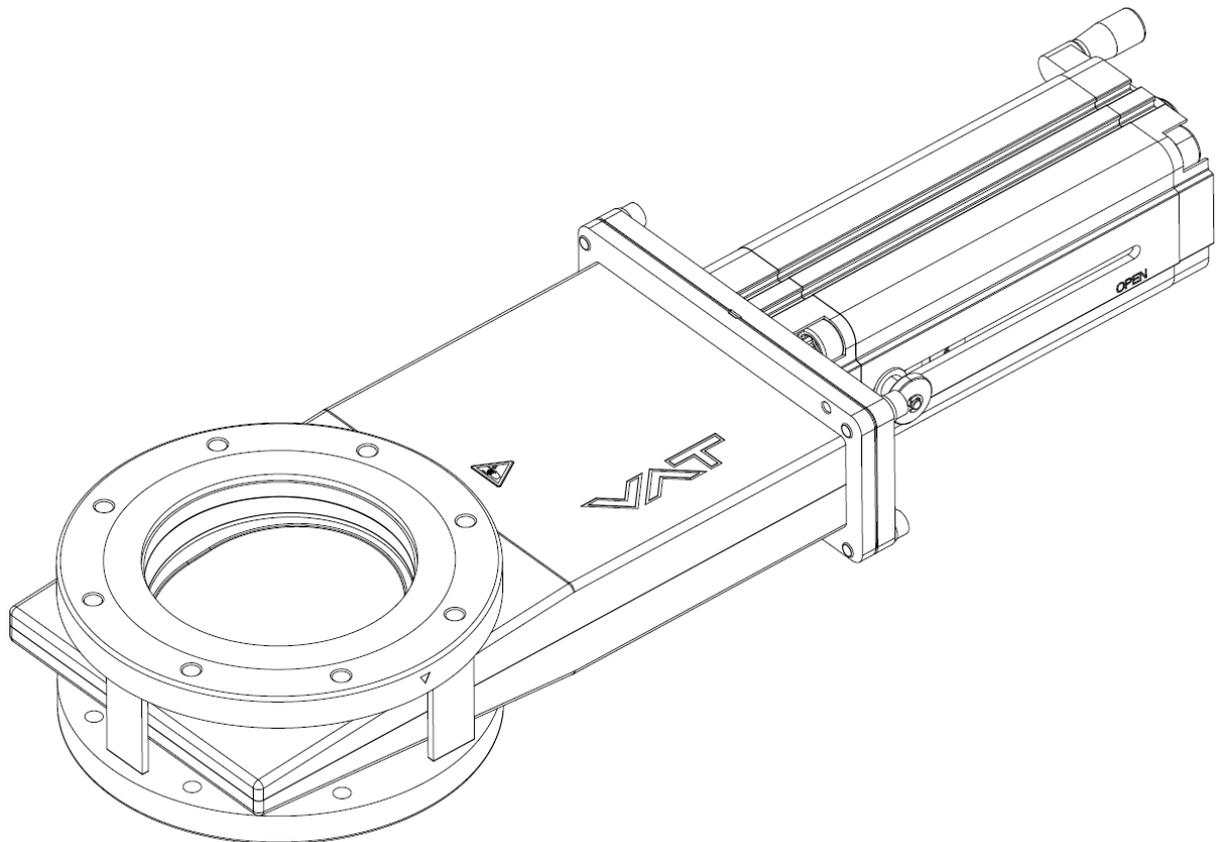


HV gate valve with manual actuator

Series 091
DN 50 – 200 mm (I. D. 2" – 8")

This manual is valid for the following product ordering number/s:

091 . . . E01/E08



Sample picture

Imprint

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Contents

1	Description of product.....	4
1.1	Identification of product	4
1.2	Use of product	4
1.3	Related documents.....	4
1.4	Important information.....	4
1.5	Technical data	4
2	Safety	5
2.1	Compulsory reading material.....	5
2.2	Danger levels	5
2.3	Personnel qualifications.....	6
2.4	Safety labels.....	6
3	Design and Function.....	7
3.1	Design	7
3.2	Function.....	7
4	Installation	8
4.1	Unpacking	8
4.2	Installation into the system	8
4.2.1	Admissible forces and bending moments	10
4.3	Electrical connection.....	11
5	Operation	12
5.1	Normal operation.....	12
5.2	Operation under increased temperature.....	12
6	Trouble shooting.....	13
7	Maintenance	14
7.1	Maintenance intervals.....	14
7.2	Required tools	14
7.3	Cleaning of the valve gate and body	15
8	Repairs	26
8.1	FPR Service	26
9	Dismounting and Storage.....	27
9.1	Dismounting	28
9.2	Storage.....	28
10	Packaging and Transport	29
10.1	Packaging.....	30
10.2	Transport.....	30
11	Disposal	31
12	Spare parts	32
13	Appendix.....	33

1 Description of product

1.1 Identification of product

The fabrication number and order number are fixed on the product directly or by means of an identification plate.



1.2 Use of product

Use product for clean and dry vacuum applications only. Other applications are only allowed with the written permission of VAT.

1.3 Related documents

- Product data sheet
- Dimensional drawing

1.4 Important information



This symbol points to a very important statement that requires particular attention.

Example:



VAT disclaims any liability for damages resulting from inappropriate packaging.

1.5 Technical data

See product data sheet and dimensional drawing.

2 Safety

2.1 Compulsory reading material

Read this chapter prior to performing any work with or on the product. It contains important information that is significant for your own personal safety. This chapter must have been read and understood by all persons who perform any kind of work with or on the product during any stage of its serviceable life.

	NOTICE
	<p>Lack of knowledge Failing to read this manual may result in property damage. Firstly, read manual.</p>



These Installation, Operating & Maintenance Instructions are an integral part of a comprehensive documentation belonging to a complete technical system. They must be stored together with the other documentation and accessible for anybody who is authorized to work with the system at any time.

2.2 Danger levels

	⚠ DANGER
	<p>High risk Indicates a hazardous situation which, if not avoided, will result in death or serious injury.</p>

	⚠ WARNING
	<p>Medium risk Indicates a hazardous situation which, if not avoided, could result in death or serious injury.</p>

	⚠ CAUTION
	<p>Low risk Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.</p>

	NOTICE
	<p>Command Indicates a hazardous situation which, if not avoided, may result in property damage.</p>

2.3 Personnel qualifications

	 WARNING
	<p>Unqualified personnel Inappropriate handling may cause serious injury or property damage. Only qualified personnel are allowed to carry out the described work.</p>

2.4 Safety labels

Label	Part No.	Location on valve
	T-9001-155	Protective cover

Table 2-1

3 Design and Function

3.1 Design

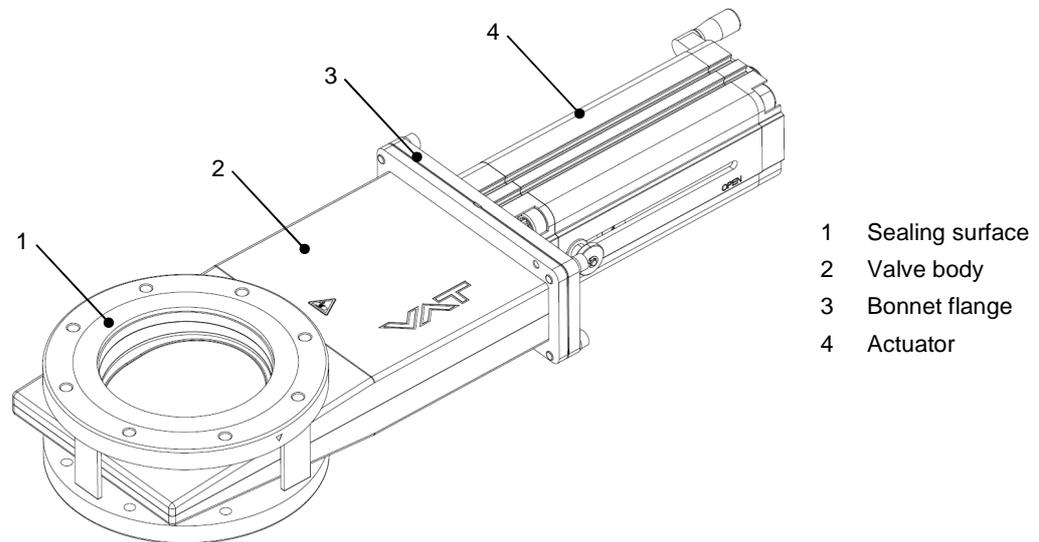


Figure 3-1

3.2 Function

The valve sealing principle is based on a wedge shape gate design. The gate seal is pressed against the sealing surface by means of a manual actuator. The valve is standard equipped with a bellows feedthrough. Optional the valve can be equipped with a shaft feedthrough, with or without PTFE protection bellows.

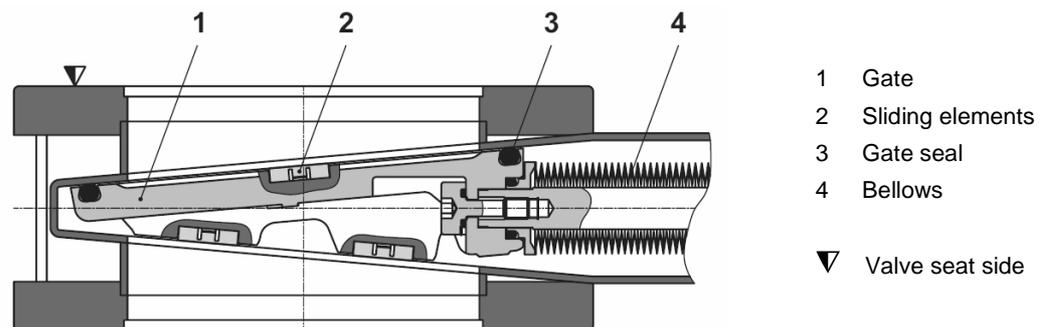


Figure 3-2

4 Installation

	WARNING
	<p>Unqualified personnel Inappropriate handling may cause serious injury or property damage. Only qualified personnel are allowed to carry out the described work.</p>

4.1 Unpacking



- Make sure that the supplied products are in accordance with your order.
- Inspect the quality of the supplied products visually. If it does not meet your requirements, please contact VAT immediately.
- Store the original packaging material. It may be useful if products must be returned to VAT.

4.2 Installation into the system

	WARNING
	<p>Movable parts Human body parts may get jammed and severely injured. Do not connect or supply electrical power before the product is completely mounted in the system.</p>

	NOTICE
	<p>Contamination Product may get contaminated. Always wear cleanroom gloves when handling the product.</p>

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

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

NOTICE	
	<p>Too long screws</p> <p>Valve body may get deformed and / or malfunctions may occur. Use only screws recommended by VAT.</p>

Identify flange type according the fabrication number on the identification plate;
see Example: 091 . . . - P . . . / . . . = Flange type ISO-F.

Valve			Maximum screw-in depth «G» in mm				
Nom. I.D.			Flange types				
mm	inch		C	U	P	J	T
63	2½	G =	12	12	12	12	12
80	3	G =	12	12	12	12	12
100	4	G =	12	12	12	12	12
160	6	G =	12	12	15	15	15
200	8	G =			16		

C = CF-F, metric thread
U = CF-F, UNF thread
P = ISO-F
J = JIS
T = ASA-LP

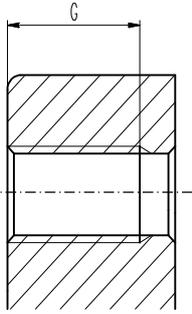


Table 4-1

4.2.1 Admissible forces and bending moments



Forces from evacuating the system, from the weight of other components or 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 or bending moments are admissible:

DN (nom. I.D.)		Axial tensile or compressive force «FA»		Bending moment «M»	
mm	inch	N	lbf	Nm	lbf · ft
50	2	500	112	30	22
63	2½	1960	440	78	58
80	3	2450	560	98	72
100	4	2450	560	98	72
160	6	2940	660	147	108
200	8	2940	660	147	108

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

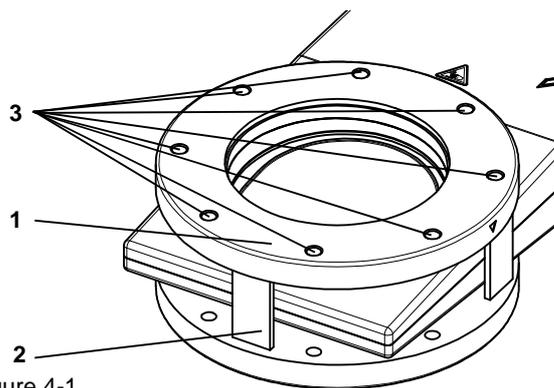
Table 4-2

1. Remove protective covers from body flanges.
2. Clean sealing surfaces and seals of both flanges; see (1) and (2) according to «Figure 4-1».



The valve seat side is marked with the symbol « ∇ » on flange «A».

3. Lift valve to the mounting position.
4. Mount the four screws (3) according to «Figure 4-1», evenly in crosswise order until the seal touches the sealing surface.



- 1 Flange A
- 2 Flange B
- 3 Screws

5. Tighten all screws with the torques appropriate for their property classes.

4.3 Electrical connection

	⚠ DANGER
	Electric shock Parts being under voltage will result in serious injury or death. Do not touch parts being under voltage.

	NOTICE
	Wrong voltage Electrical components may get damaged. Supply electrical components with the correct voltage.

1. Connect position indicator (option) according to the product data sheet and dimensional drawing.
2. Connect heater (option) according to the product data sheet and dimensional drawing.

5 Operation

	⚠ WARNING
	Unqualified personnel Inappropriate handling may cause serious injury or property damage. Only qualified personnel are allowed to carry out the described work.

	⚠ WARNING
	Movable parts Human body parts may get jammed and severely injured. Do not operate before product is installed completely into the vacuum system.

5.1 Normal operation

Valve is opened and closed by manual rotation of the actuator lever.

5.2 Operation under increased temperature

Maximum allowed temperature, see product data sheet.

6 Trouble shooting

Failure	Check	Action	See
Valve does not close / open	Actuator locked	Check rotation direction of lever	«5.1 Normal operation»
Leak at gate	Gate seal all right?	Replace gate seal	«7.3 Cleaning of the valve gate and body»
	Gate damaged or contaminated?	Contact VAT	www.vatvalve.com
Leak at body	Bonnet seal and sealing surface all right?	Clean sealing surface, if necessary, replace bonnet seal	«7.3 Cleaning of the valve gate and body»

Table 6-1

If you need any further information, please contact one of our service centers. You will find the addresses on our website www.vatvalve.com.

7 Maintenance



Ensure that the maintenance technician is familiar with the safety precautions which relate to the product. Wear appropriate safety clothing when you come into contact with contaminated components. Dismantle and clean contaminated components inside a fume cupboard.

	WARNING
	<p>Unqualified personnel Inappropriate handling may cause serious injury or property damage. Only qualified personnel are allowed to carry out the described work.</p>

	WARNING
	<p>Hazardous components Human body parts may get jammed and severely injured. Before starting maintenance: – disconnect electrical power supply</p>

	WARNING
	<p>Movable parts Human body parts may get jammed and severely injured. Keep human body parts away from movable parts.</p>

7.1 Maintenance intervals

Under clean operating conditions the valve does not require any maintenance during specified service lifetime; see product data sheet. Contamination from the process may influence the function and requires more frequent maintenance. After these cycles, VAT recommends to clean the gate seal or if needed, replace the gate seal.

For more information or a general overhaul please contact one of our service centers. You will find the addresses on our website www.vatvalve.com.

7.2 Required tools

- Allen wrench
- Screwdriver
- Cleanroom wiper soaked with alcohol (2% methyl ethyl ketone)
- O-Ring removal tool; see «Table 12-1» on page 32.

7.3 Cleaning of the valve gate and body

	⚠ WARNING
	Loaded spring steel sheet Human body parts may get jammed and severely injured. Do not put human body parts between valve gate and spring steel sheet.

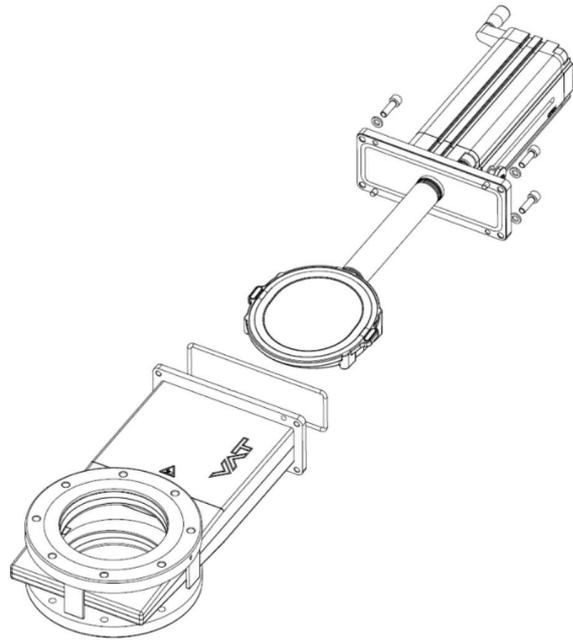
	NOTICE
	Contamination Product may get contaminated. Always wear cleanroom gloves when handling the product.

	NOTICE
	Inappropriate tools Sealing surfaces may get damaged. Do not use sharp-edged tools.



Do not clean the O-ring with alcohol, because alcohol may damage the surface of the O-rings, we recommend to treat the O-rings with a small amount of vacuum grease.

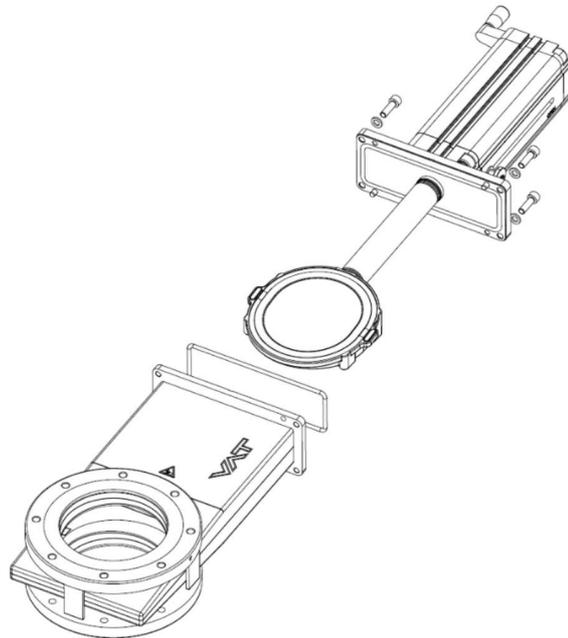
1. Vent chambers on either side of the valve to atmospheric pressure.
2. Open the valve.
3. Remove screws (1); see «



- 1 Screws
- 2 Valve insert
- 3 Valve body

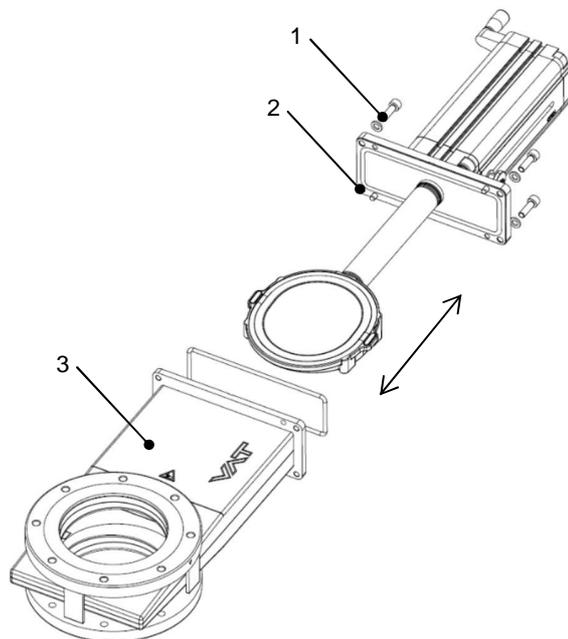
- 4. Figure 7-1» on page 17.
- 5. Disconnect electrical power supply.

7. Pull out valve insert (2) from valve body (3); see «



- 4 Screws
- 5 Valve insert
- 6 Valve body

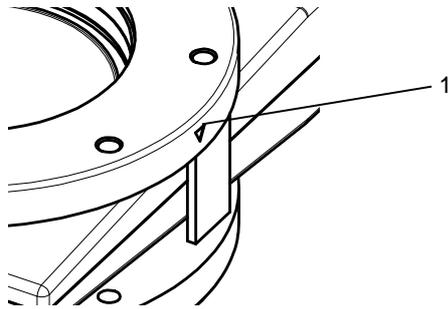
8. Figure 7-1».



- 7 Screws
- 8 Valve insert
- 9 Valve body

Figure 7-1

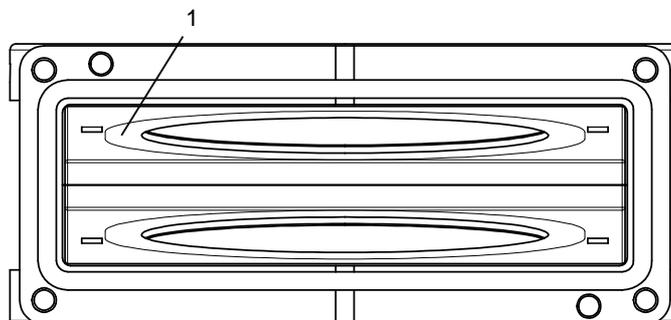
Identify seat side marker "∇"; see «Figure 7-2».



1 Seat side marker

Figure 7-2

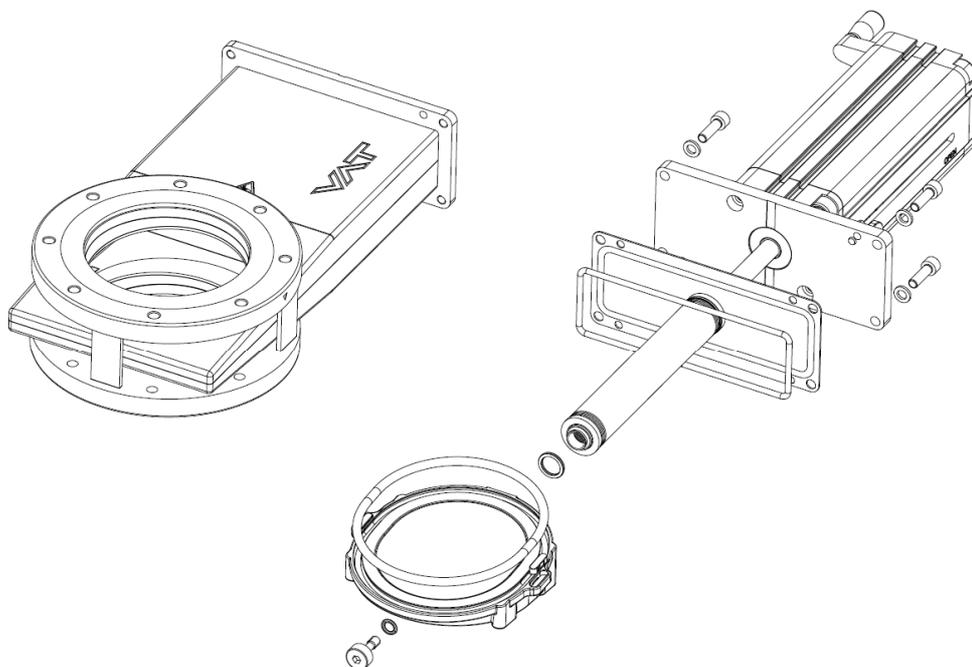
9. Clean gate sealing surfaces (1) (seat side) and other surfaces inside valve body; see «Figure 7-3».



1 Sealing surface

Figure 7-3

10. Clean or replace the gate O-ring (13); see «



5 Bellows sealing surface
 6 Bonnet O-ring
 12 Gate O-ring

11. Figure 7-5» on page 23, use O-ring removal tool.



VAT recommends that whenever the gate O-ring is changed to also change the gliders (Peek-tabs) on both sides of the gate; see item 11 and 12.

12. Continue with step 13 when the gliders are not replaced.
13. Remove gliders from the front and backside of the gate with a small, edge shaped tool e.g. screwdriver. Squeeze tool into gap between glider and gate (a); see «Figure 7-4». Push down the tool (b) to release glider from pocket and remove glider (c).

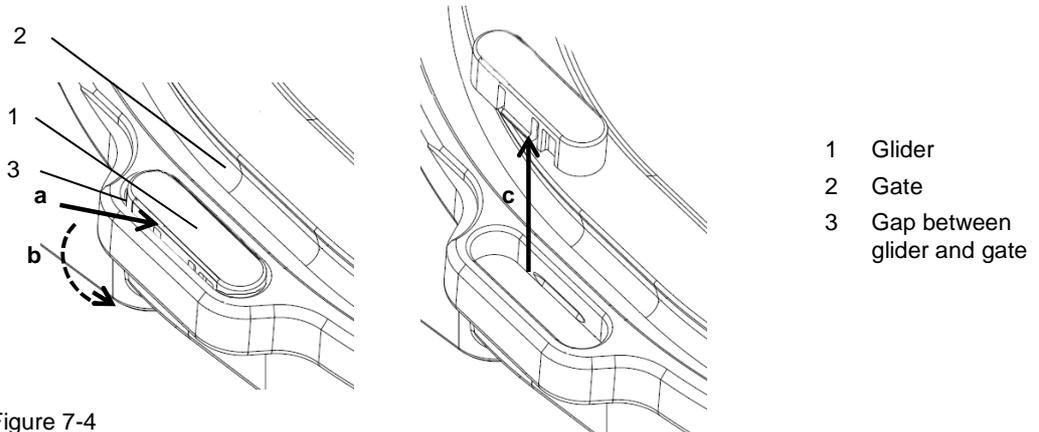
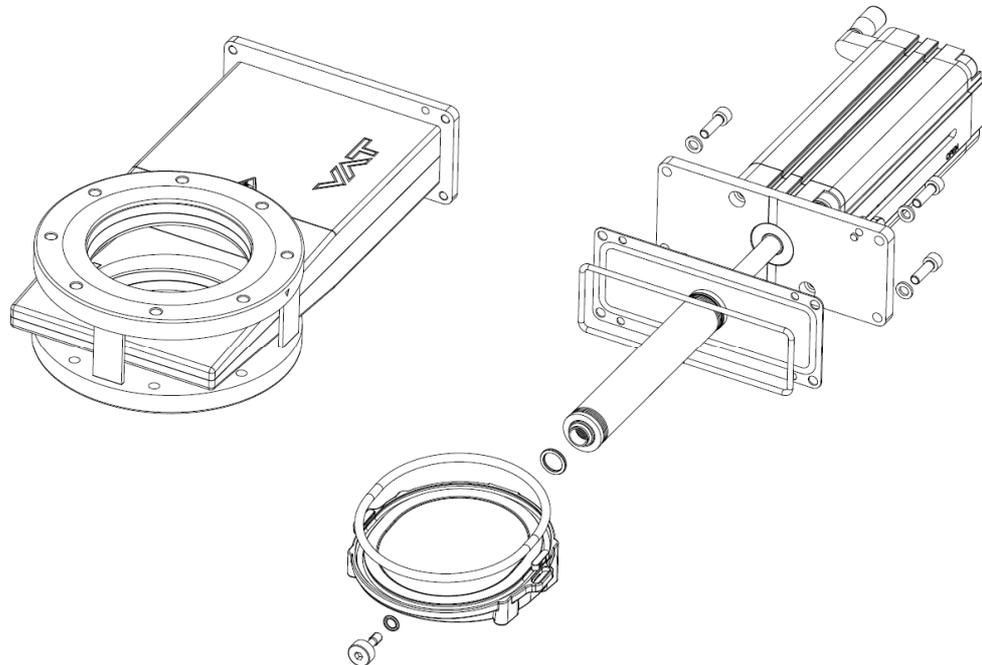


Figure 7-4

14. Mount the gliders (1) by gently pushing the gliders in the designated pockets in the gate.

15. Clean or replace bonnet O-ring (7); see «

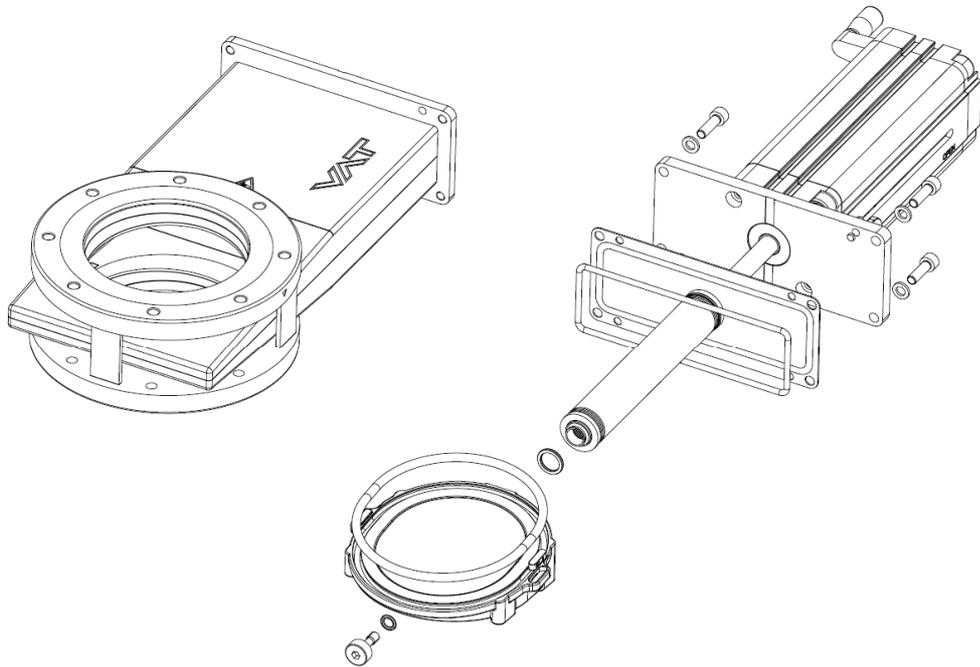


5 Bellows sealing surface

6 Bonnet O-ring

12 Gate O-ring

16. Figure 7-5»; use O-ring removal tool.
17. Clean sealing surface of bellows (6); see «



- 5 Bellows sealing surface
- 6 Bonnet O-ring
- 12 Gate O-ring

18. Figure 7-5».



Do not damage or scratch O-ring sealing surface.

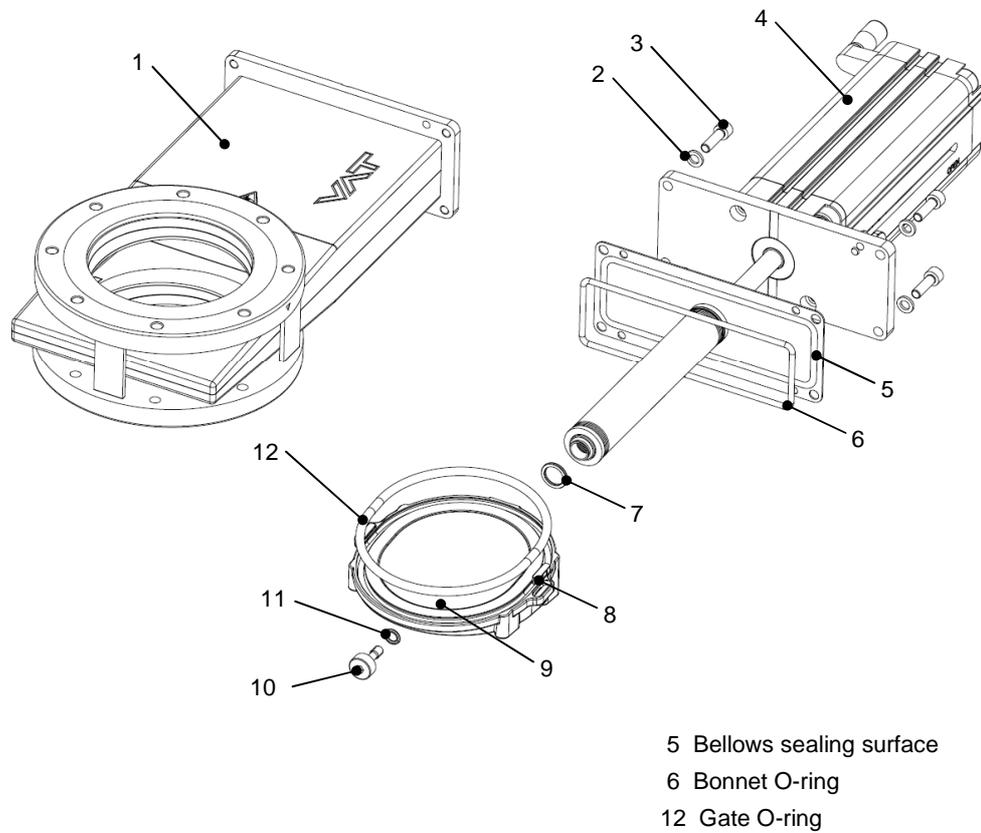
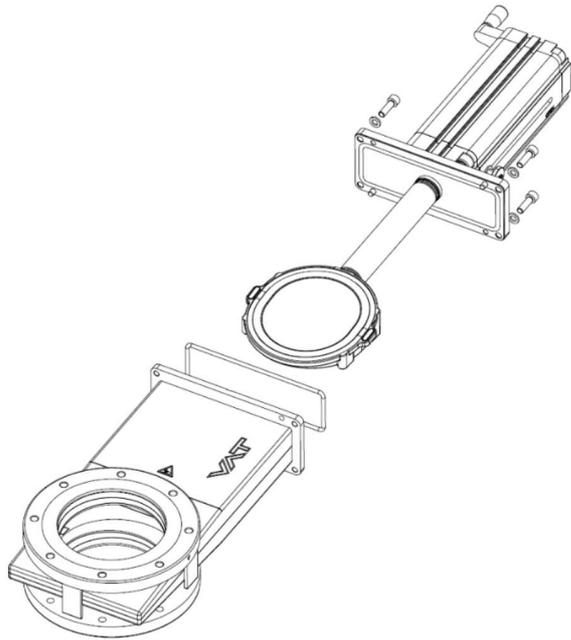


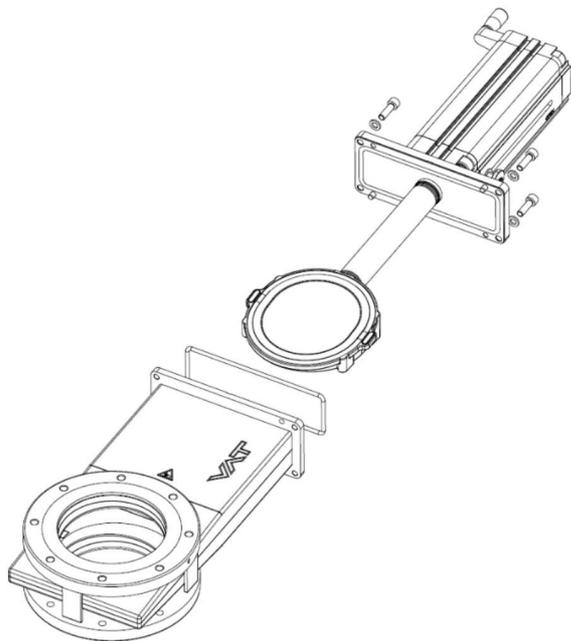
Figure 7-5

19. Mount valve insert (2) into the valve body (3); «



- 10 Screws
- 11 Valve insert
- 12 Valve body

20. Figure 7-1» on page 17. Assure that the gate O-ring is facing the valve body seat side marker "∇"; see «Figure 7-2» on page 18.
21. Mount screws (1) according to «



- 13 Screws
- 14 Valve insert
- 15 Valve body

22. Figure 7-1» on page 17.



23. Connect position indicator (option) according to the product data sheet and dimensional drawing.

Valve is ready for use.

8 Repairs

Repairs may only be carried out by the VAT service staff. In exceptional cases, the customer is allowed to carry out the repairs, but only with the prior consent of VAT.

Please contact one of our service centers. You will find the addresses on our website www.vatvalve.com.

8.1 FPR Service

The VAT customer service can refurbish the product or individual components for you. Wear-sensitive parts are replaced, and the guarantee on the replaced parts is extended.

- a) Select the desired Fixed Price Refurbishment service from our comprehensive service program for the refurbishment.
- b) Contact your assigned sales person or the nearest VAT service center to learn about the options for the product in question. www.vatvalve.com.

9 Dismounting and Storage

	<p style="text-align: center;">⚠ WARNING</p> <p>Unqualified personnel Inappropriate handling may cause serious injury or property damage. Only qualified personnel are allowed to carry out the described work.</p>
	<p style="text-align: center;">⚠ WARNING</p> <p>Hazardous components Human body parts may get jammed and severely injured. Before dismantling the product – disconnect electrical power supply</p>
	<p style="text-align: center;">⚠ WARNING</p> <p>Movable parts Human body parts may get jammed and severely injured. Keep human body parts away from movable parts.</p>
	<p style="text-align: center;">NOTICE</p> <p>Contamination Product may get contaminated. Always wear cleanroom gloves when handling the product.</p>

9.1 Dismounting

NOTICE	
	<p>Valve in open position</p> <p>Valve mechanism may get damaged if valve is in open position. Close valve before dismounting the valve from the system.</p>

1. Close valve.
2. Carry out the steps according to chapter «4 Installation» in reverse order.
Pay attention to the safety instructions.

9.2 Storage

NOTICE	
	<p>Wrong storage</p> <p>Inappropriate temperatures and humidity may cause damage to the product. Valve must be stored at:</p> <ul style="list-style-type: none">– relative humidity between 10% and 70%– temperature between +10 °C and +50 °C– non-condensing environment

NOTICE	
	<p>Inappropriate packaging</p> <p>Product may get damaged if inappropriate packaging material is used. Always use the original packaging material and handle product with care.</p>

1. Clean / decontaminate valve.
2. Cover all valve openings with a protective foil.
3. Pack valve appropriately, by using the original packaging material.

10 Packaging and Transport

	<p style="text-align: center;">⚠ WARNING</p> <p>Unqualified personnel Inappropriate handling may cause serious injury or property damage. Only qualified personnel are allowed to carry out the described work.</p>
	<p style="text-align: center;">⚠ WARNING</p> <p>Harmful substances Risk of injury in case of contact with harmful substances. Remove harmful substances (e. g. toxic, caustic or microbiological ones) from valve before you return the valve to VAT.</p>
	<p style="text-align: center;">NOTICE</p> <p>Inappropriate packaging Product may get damaged if inappropriate packaging material is used. Always use the original packaging material and handle product with care.</p>



- When returning products to VAT, please fill out the VAT form «Declaration of Chemical Contamination» and send it to VAT in advance. The form can be downloaded from our website www.vatvalve.com.
- If products are radioactively contaminated, the VAT form «Contamination and Radiation Report» must be filled out. Please contact VAT in advance.
- If products are sent to VAT in contaminated condition, VAT will carry out the decontamination procedure at the customer's expense.

10.1 Packaging

	NOTICE
	<p>Valve in open position</p> <p>Valve mechanism may get damaged if valve is in open position. Make sure that the valve is closed.</p>

1. Cover all valve openings with a protective foil.
2. Pack valve appropriately, by using the original packaging material.



VAT disclaims any liability for damages resulting from inappropriate packaging.

10.2 Transport

	NOTICE
	<p>Inappropriate packaging</p> <p>Product may get damaged if inappropriate packaging material is used. Always use the original packaging material and handle product with care.</p>



VAT disclaims any liability for damages resulting from inappropriate packaging.

11 Disposal

Observe the local regulations for disposal

	⚠ WARNING
	<p>Harmful substances Environmental pollution. Discard products and parts according to the local regulations.</p>

	⚠ WARNING
	<p>Unqualified personnel Inappropriate handling may cause serious injury or property damage. Only qualified personnel are allowed to carry out the disposal.</p>

	⚠ CAUTION
	<p>Risk of damage Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury. A large number of diverse materials are used in the product. Some of them could cause human and machine damage in the case of improper handling.</p> <ul style="list-style-type: none"> • Observe local regulations in regard to waste disposal without fail. • Commission an authorized waste disposal company for the professional disposal of your waste.

	NOTICE
	<p>Improper disposal Some built-in materials can cause damage, if improperly handled. - When disposing, take into account all the different materials used</p>



- Hire an authorised waste disposal company to dispose of the waste in a professional manner.

The following list should help you to dismantle your product without making serious errors and to properly separate out the product scrap.

Material groups	Hazard level
non-ferrous metals	high
stainless steel	low
aluminium	low
plastics	medium
lubricants	high
electronic scrap	high
batteries	very high
cables and wires	medium
motors	medium
seals and rubber parts	high

12 Spare parts

	NOTICE
	<p>Non-original spare parts</p> <p>Non-original spare parts may cause damage to the product. Use original spare parts from VAT only.</p>



- Please specify the fabrication number of the product when you place an order for spare parts; see chapter «1.1 Identification of product». This is to ensure that the appropriate spare parts are supplied.
- VAT makes a difference between spare parts that may be replaced by the customer and those that need to be replaced by the VAT service staff.
- «Table 12-1» only contains spare parts that may be replaced by the customer. If you need any other spare parts, please contact one of our service centers. You will find the addresses on our website www.vatvalve.com.

Description	Part No.	Quantity per valve	Maintenance procedure see chapter
Seal kit	On request	1	«7.3 Cleaning of the valve gate and body»
Gate O-ring	On request	1	«7.3 Cleaning of the valve gate and body»
Glider	On request	1	«7.3 Cleaning of the valve gate and body»
Bonnet flange O-ring	On request	1	«7.3 Cleaning of the valve gate and body»
O-ring removal tool	234859	1	«7.3 Cleaning of the valve gate and body»

Table 12-1

13 Appendix

