Installation, Operating & Maintenance Instructions

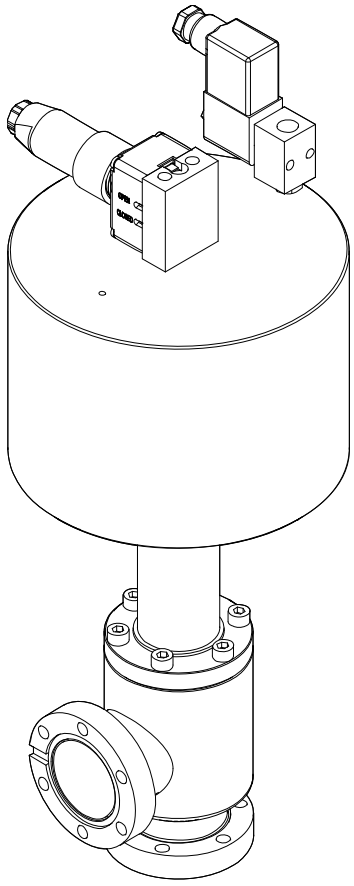
All-Metal Angle Valve

with single acting pneumatic actuator and closing spring

Series 571
DN 16 – 40 mm (I. D. ⅝" – 1½")

This manual is valid for the following product ordering numbers:

57124- . E . . - ….
57132- . E . . - ….



Sample picture

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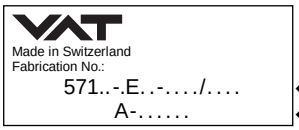
Contents

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.



← Fabrication number
← Order number

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.

Weights of standard valves:

DN 16: 3.05 kg
DN 40: 9 kg

Weight of special valves, see product data sheet.

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

Lack of knowledge

Failing to read this manual may result in property damage.

Firstly, read manual.

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

High risk

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Medium risk

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Low risk

Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

Command

Indicates a hazardous situation which, if not avoided, may result in property damage.

2.3 Personnel qualifications

⚠ WARNING

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

2.4 Safety labels

Label	Part No.	Location on valve
	T-9001-155	On protective covers of flanges

Table 2-1

3 Design and Function

3.1 Design

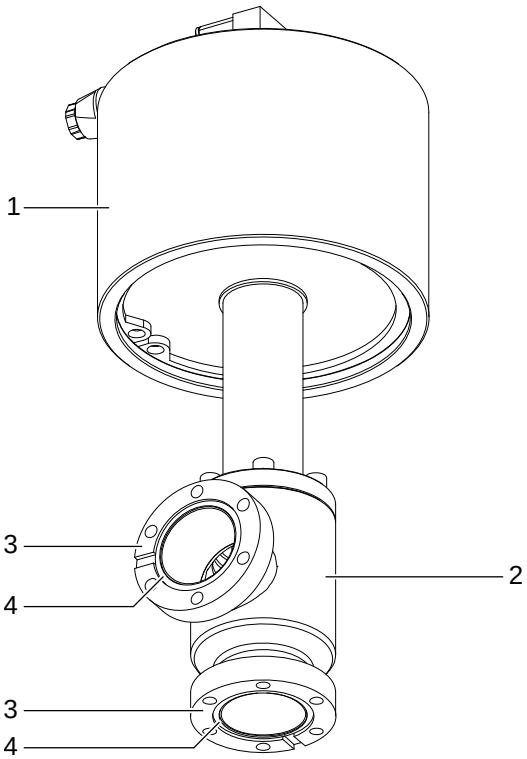


Figure 3-1

1 Actuator
2 Valve body
3 Connecting flange
4 Sealing surface

3.2 Function

Valve is closed by a spring. Valve is opened pneumatically.

Closing:
The valve plate moves towards the seat. The VATRING (**1**) moves into the valve seat and closes leak tight.

Opening:
The valve plate moves back from the valve seat until the open stop is reached.

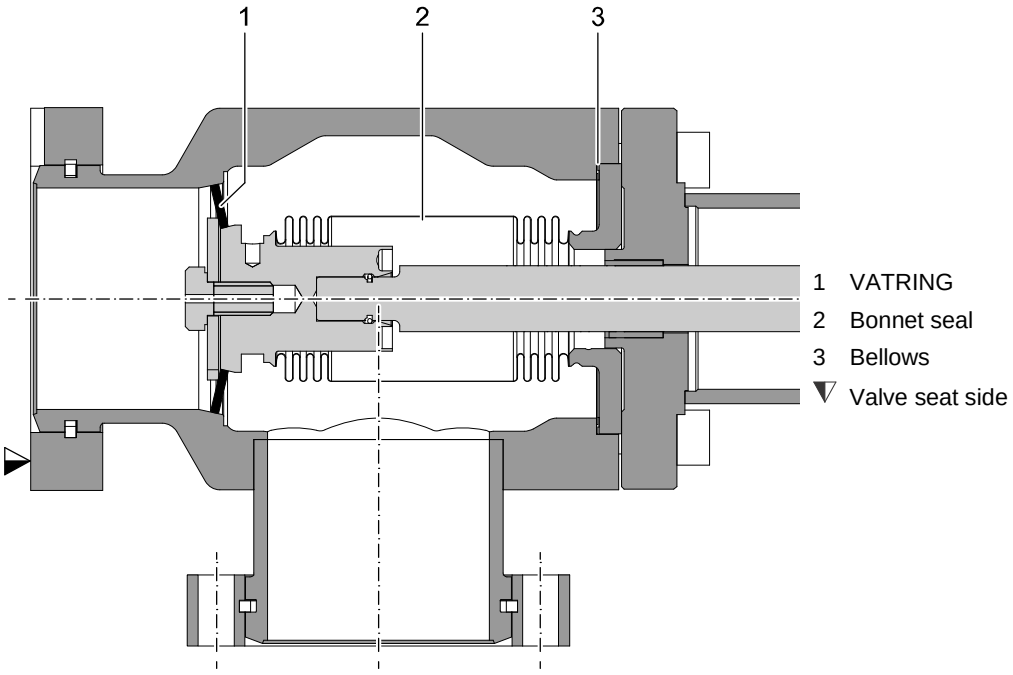


Figure 3-2

4 Installation

⚠ WARNING

Unqualified personnel

Inappropriate handling may cause serious injury or property damage.

Only qualified personnel are allowed to carry out the described work.

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.

Do not open the plastic bag before mounting the valve into a system.

NOTICE

Sensitive product

Valve parts may get damaged.

– When lifting the valve, pay attention that the valve does not touch any solid objects.

– Lift valve carefully and put it down on a clean surface or mount it to a clean system.

Weight of standard valves; see chapter «1.5 Technical data».

4.2 Installation into the system

⚠ WARNING

Movable parts

Human body parts may get jammed and severely injured.

Do not connect or supply electrical power and compressed air before the product is completely mounted in the system.

NOTICE

Contamination

Product may get contaminated.

Always wear cleanroom gloves when handling the product.

NOTICE

Force effect from other components of the system

Valve body may get deformed and/or malfunctions may occur.

– Do not use valve to support other components.
– Make sure that forces from other components do not impair the valve; use bellows sections, for instance.

4.2.1 Preparation for installation

⚠ WARNING

Danger of injury in case of insufficient skills

Inappropriate handling may cause serious injury or property damage.

Make sure that the valve does not topple or fall down while removing the protective covers from the flanges.

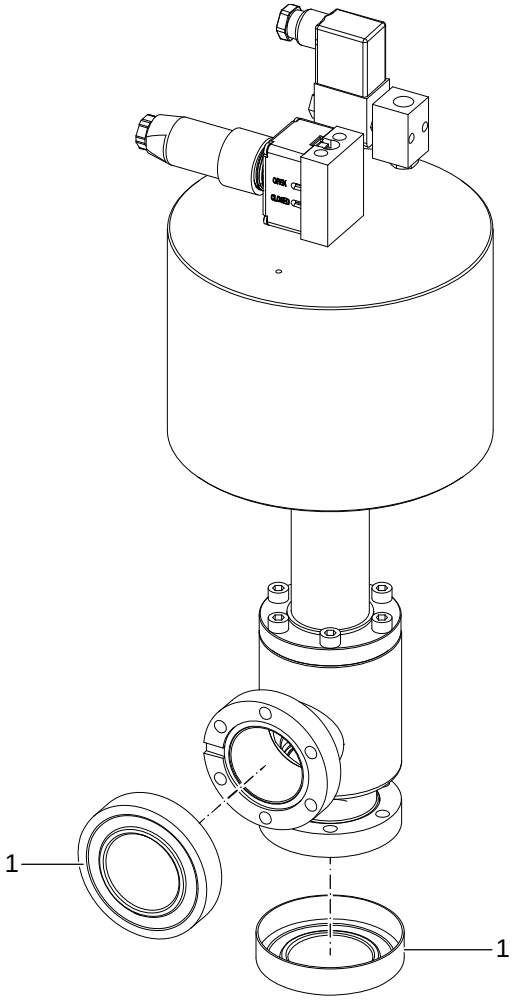
NOTICE

Sensitive product

Valve parts may get damaged.

When removing the protective covers from the flanges, be careful to avoid damage to the valve.

1. Remove plastic bag.



1 Protective covers

Figure 4-1

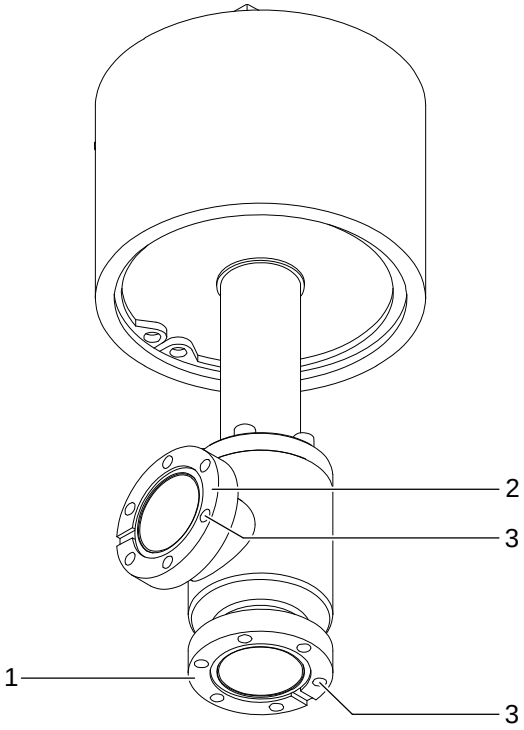
2. Remove protective covers (**1**).

Store protective covers. They may be useful when valve needs to be repacked.

3. Clean sealing surfaces; see «Figure 3-1» on page 7, with a cleanroom wiper soaked with pure alcohol (Isopropanol).

4. Clean sealing surface with clean, dry and oil free compressed air.

4.2.2 Mounting to the system



1 Flange A (valve seat side)
2 Flange B
3 Screw holes

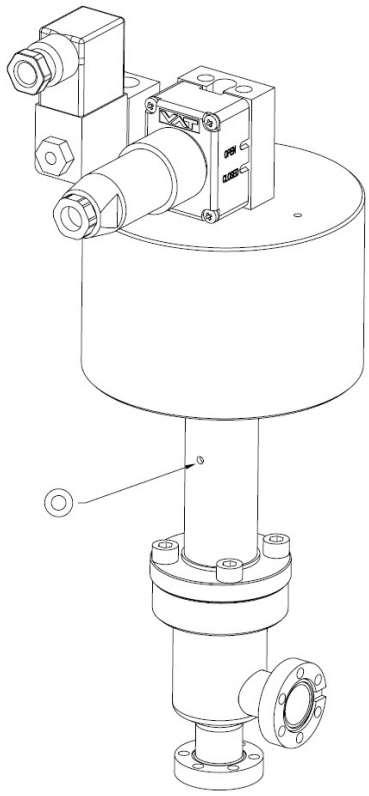
Figure 4-2

5. Mount valve to your system by using appropriate flange screws (different quantity of screws required – depending on valve size).

6. Mount screws evenly in crosswise order until the seal touches the sealing surface.

7. Tighten all screws with the torques appropriate for the property classes of the screws. Apply the torque gradually and in crosswise order.

8. Do not block Leak detection port, see sample picture at «Figure 4-3». Please find the exact position of the Leak detection port on the dimensional drawing.



◎ Leak detection port

Figure 4-3

4.3 Compressed air connection

⚠ WARNING

Valve in open position

Risk of injury when compressed air is connected to the valve.

Connect compressed air only when:
– valve is installed in the vacuum system
– moving parts cannot be touched

NOTICE

Wrong sequence of connections

Valve mechanism may get damaged when electrical power is being connected before compressed air is connected.

Always connect compressed air before connecting electrical power.

Use clean, dry or slightly oiled air only.

Admissible air pressure range, see product data sheet.

10. Connect compressed air according to the product data sheet and dimensional drawing.

Ordering numbers:	571 ... - .	without solenoid valve, without position indicator
	E11	without solenoid valve, with position indicator
	571 ... - .	with solenoid, without position indicator
	E21	with solenoid, with position indicator
	571 ... - .	
	E31	
	571 ... - .	
	E41	

4.4 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 sequence of connections

Valve mechanism may get damaged when electrical power is being connected before compressed air is connected.

Always connect compressed air before connecting electrical power.

NOTICE

Wrong voltage

Electrical components may get damaged.

Supply electrical components with the correct voltage.

11. Connect position indicator according to the product data sheet and dimensional drawing.

12. Connect solenoid valve according to the product data sheet and dimensional drawing.

Ordering numbers:	571 ... - .	without solenoid valve, without position indicator
	E11	without solenoid valve, with position indicator
	571 ... - .	with solenoid, without position indicator
	E21	with solenoid, with position indicator
	571 ... - .	
	E31	
	571 ... - .	
	E41	

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

The valve is closed by a closing spring and opened with compressed air.

For technical details, see product data sheet.

Action	Execution	Procedure
To open valve	Without solenoid valve 571 ... - . E11- .... 571 ... - . E21-	Supply admissible compressed air to connection ⊙ on cylinder.
	Standard solenoid valve 571 ... - . E31- .... 571 ... - . E41-	Supply admissible compressed air to connection ⊙ on solenoid valve. Supply voltage (observe voltage specification on coil) to connection ⊖ SV.

Table 5-1

Action	Execution	Procedure
To close valve	Without solenoid valve 571 ... - . E11- .... 571 ... - . E21-	Release compressed air pressure through connection ⊙ on cylinder.
	Standard solenoid valve 571 ... - . E31- .... 571 ... - . E41-	Release voltage from connection ⊖ SV.

Table 5-2

5.2 Operation under increased temperature

Maximum allowed temperature, see product data sheet.

NOTICE

Inconstant temperatures

Performance of the valve may deteriorate.

– Actuate valve only after the bake-out temperature has been stable for two hours.
– If valve must be actuated during bake-out, make sure that the heating or cooling rate does not exceed 30 °C per hour in the temperature range from 200°C to 350 °C
– Make sure that the temperature differences over the whole body do not exceed 30 °C.

5.3 Bake-out

See product data sheet.

5.4 Behavior in case of air pressure drop

See product data sheet.

5.5 Behavior in case of power failure

See product data sheet.

5.5.1 Manual emergency operation

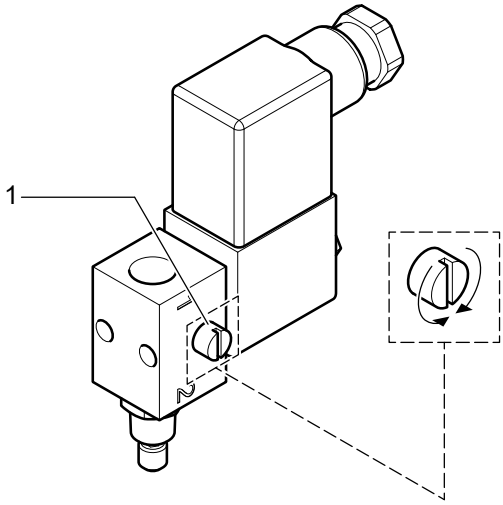
⚠ WARNING

Movable parts

Human body parts may get jammed and severely injured.

Keep human body parts away from movable parts.

The solenoid valves are provided with manual emergency operation (slotted screw). This screw allows actuating the valve in case of a power failure. Compressed air must be supplied!



1 Slotted screw

Figure 5-1

To close the valve: Turn the slotted screw (**1**) counter-clockwise to its stop.

To open the valve: Turn the slotted screw (**1**) clockwise to its stop.

For remote operation make sure that the slotted screw is turned counter-clockwise to its stop.

5.6 Trouble shooting

Failure	Check	Action	See
Valve mechanism does not move	Compressed air	Connect compressed air supply	«4.3 Compressed air connection»
	Electrical power	Connect electrical power	«4.4 Electrical connection»
	Operating pressure	Adjust operating pressure	«4.3 Compressed air connection»
	Position of slotted screw	Turn slotted screw to the correct position	«5.5.1 Manual emergency operation»
Leak at gate	Condition of gate seal	Please contact VAT	www.vatvalve.com
	Operating pressure	Adjust operating pressure	«4.3 Compressed air connection»
Leak at body	Condition of bonnet seal and sealing surface	Please contact VAT	www.vatvalve.com
	Condition of bellows	Please contact VAT	www.vatvalve.com

Table 5-3

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

6 Maintenance

6.1 Maintenance intervals

Under clean operating conditions the valve does not require any maintenance during the specified lifetime.

- Impacts from the process may require more frequent maintenance.
- When the valve has reached the specified lifetime; see product data sheet, we recommend having it serviced by VAT. Please contact your nearest VAT service center to get recommendations and an offer. You will find the addresses on our website www.vatvalve.com.

7 Repairs

⚠ WARNING

Unqualified personnel

Inappropriate handling may cause serious injury or property damage.

Only qualified personnel are allowed to carry out the described work.

⚠ WARNING

Danger of injury in case of insufficient skills

Inappropriate handling may cause serious injury or property damage.

Make sure that the valve does not topple or fall down while removing the protective covers from the flanges.

NOTICE

Contamination

Product may get contaminated.

Always wear cleanroom gloves when handling the product.

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.

7.1 Replacement of dynamic seal VATRING

In case of a seat seal leak caused by environmental influences and no visible damage of the sealing surface at the seat, the VATRING seal can be replaced.
VAT offers a range of components; see «Table 11-1» on page 31. The seal exchange can be carried out by the user.

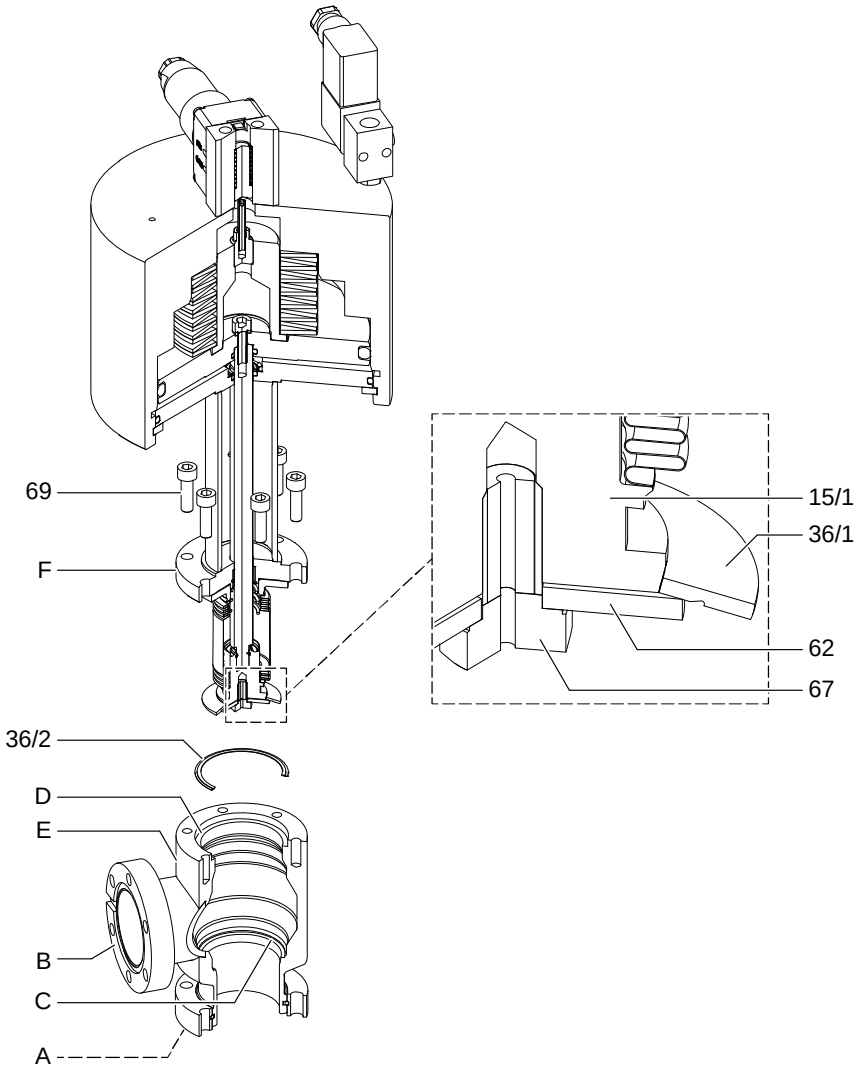


Figure 7-1

69	Bonnet screws	C	Seat sealing surface
F	Valve insert	A	Flange A (valve seat side)
36/2	Bonnet seal	15/1	Valve gate
D	Bonnet sealing surface	36/1	VATRING
E	Valve body	62	Holding ring
B	Flange B	67	Screw

Required material: VATRING

Ordering information: See chapter «11 Spare parts» on page 31 and «Figure 7-1» on page 22.

NOTICE

Inappropriate mounting position of valve

Maintenance may be troublesome, and parts may drop down.

Ideally dismount valve from the system and put it on a clean workbench with the actuator upwards.

Procedure:

The item numbers in brackets refer to «Figure 7-1» on page 22.

13. Open valve with compressed air and keep it open (leave compressed air pressure on) while replacing the VATRING.
14. Remove all bonnet screws (**69**).
15. Pull valve insert (**F**) carefully out of the valve body, without touching the body wall. Touching the body wall may cause severe damage to delicate parts of the insert.
16. Remove bonnet seal (**36/2**).

When loosening and tightening the screw (**67**) protect the bellows against torsion by hole or wrench size. See «Figure 7-2» on page 23.

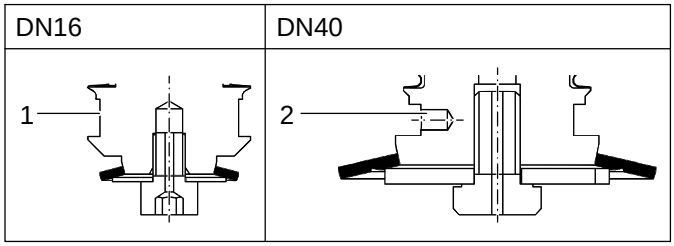


Figure 7-2

1 Wrench size 17 mm

2 Hole Ø2.6 mm

17. Clean sealing surfaces of bonnet and seat of valve body with pure alcohol (Isopropanol).
18. Remove screw (**67**).
19. Remove holding ring (**62**).
20. Remove VATRING (**36/1**).
21. Clean sealing surface of plate (**21/1**) with pure alcohol (Isopropanol), use a cleanroom wiper.

Make sure that the sealing surface is free of scratches.

22. Put new VATRING (**36/1**) on sealing surface of plate (**15/1**).

Make sure that the seal ring is installed in the correct direction.

23. Put holding ring (**62**) on plate (**15/1**).

24. Insert screw (**67**) and tighten them slightly only.

25. Level out VATRING (**36/1**) and plate (**15/1**) along the whole circumference. Height difference shall not exceed 0.1 mm. Check height difference accurately at four spots (measured angle 90°) around the whole circumference.

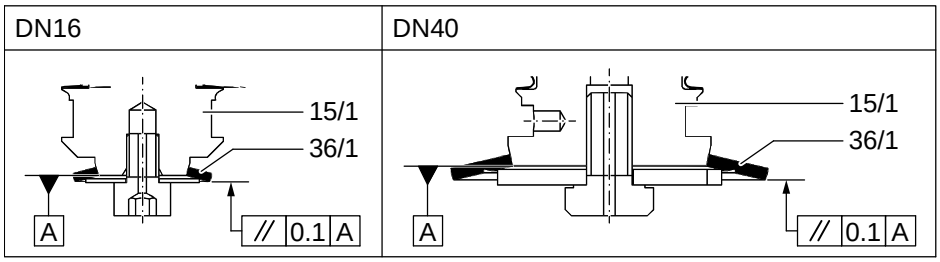


Figure 7-3

26. Clean sealing surfaces of bonnet and seat of valve body with pure alcohol (Isopropanol), use cleanroom wiper.

27. Protect bellows against torsion by hole or wrench size; see «Figure 7-3» and tighten screw (**67**) with the following torque:

    DN 16: 2.5 Nm
    DN 40: 7 Nm

28. Put bonnet seal (**36/2**) on sealing surface of valve body.

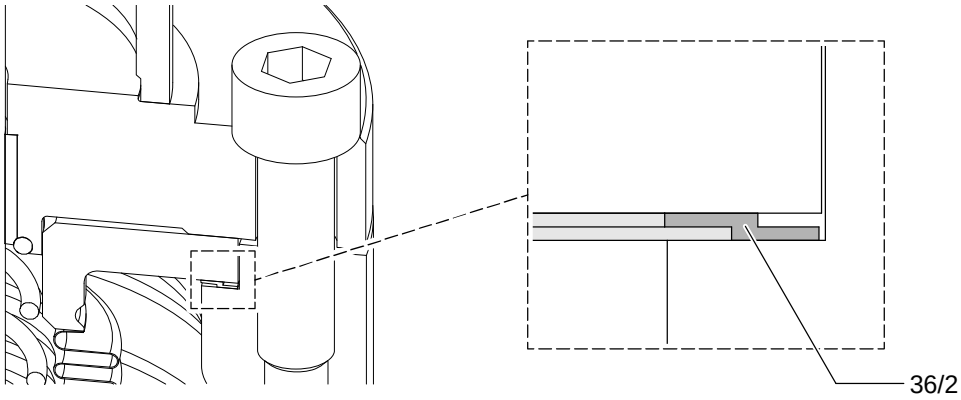


Figure 7-4

Make sure that the seal ring is installed in the correct direction.

29. Move valve insert (in open secured position) carefully into the valve without touching the body wall. Touching the body wall may cause severe damage to delicate parts of the insert.

30. Install all bonnet screws and tighten all screws gradually in crosswise order with the following torque:

    DN 16: 7 Nm
    DN 40: 7 Nm

31. Install valve to your system.

The valve is ready to use.

8 Dismounting and Storage

⚠ WARNING

Unqualified personnel

Inappropriate handling may cause serious injury or property damage.

Only qualified personnel are allowed to carry out the described work.

⚠ WARNING

Hazardous components

Human body parts may get jammed and severely injured.

Before dismounting the product
– disconnect compressed air supply
– disconnect electrical power supply

⚠ WARNING

Movable parts

Human body parts may get jammed and severely injured.

Keep human body parts away from movable parts.

NOTICE

Contamination

Product may get contaminated.

Always wear cleanroom gloves when handling the product.

8.1 Dismounting

NOTICE

Valve in open position

Valve mechanism may get damaged if valve is in open position.

Close valve before dismounting the valve from the system.

32. Close valve.
33. Disconnect electrical power supply.
34. Disconnect compressed air supply.
35. Dismount the valve according to chapter «4 Installation», however in reverse order.

Pay attention to the safety instructions in chapter «4 Installation».

8.2 Storage

NOTICE

Wrong storage

Inappropriate temperatures and humidity may cause damage to the product.

Valve must be stored at:
- relative humidity between 10% and 70%
- temperature between +10 °C and +50 °C
- non-condensing environment

NOTICE

Inappropriate packaging

Product may get damaged if inappropriate packaging material is used.

Always use the original packaging material and handle product with care.

36. Clean / decontaminate valve.
37. Install protective covers on all flanges. See «Figure 4-1» on page 11.
38. Pack valve appropriately, by using the original packaging material.

9 Packaging and Transport

⚠ WARNING

Unqualified personnel

Inappropriate handling may cause serious injury or property damage.

Only qualified personnel are allowed to carry out the described work.

⚠ WARNING

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.

NOTICE

Inappropriate packaging

Product may get damaged if inappropriate packaging material is used.

Always use the original packaging material and handle product with care.

- 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.

9.1 Packaging

NOTICE

Valve in open position

Valve mechanism may get damaged if valve is in open position.

Make sure that the valve is closed.

39. Install protective covers on all flanges. See «Figure 4-1» on page 11.

40. Pack valve appropriately, by using the original packaging material.

VAT disclaims any liability for damages resulting from inappropriate packaging.

9.2 Transport

NOTICE

Inappropriate packaging

Product may get damaged if inappropriate packaging material is used.

Always use the original packaging material and handle product with care.

VAT disclaims any liability for damages resulting from inappropriate packaging.

10 Disposal

⚠ WARNING

Harmful substances

Environmental pollution.

Discard products and parts according to the local regulations.

11 Spare parts

NOTICE

Non-original spare parts

Non-original spare parts may cause damage to the product.

Use original spare parts from VAT only.

- 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 11-1» 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	Item	DN	Part No.	Quantity per valve	Repair procedure see chapter
VATRING	36/1	16	38891-01	1	«7.1 Replacement of dynamic seal VATRING»
		40	42372-01	1	
Bonnet seal	36/2	16	209150	1	
		40	90367-01	1	
Bonnet screws	69	16	N-5019-788	4	
		40	N-5019-790	6	

Table 11-1