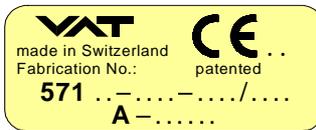


## All-Metal Angle Valve Manual actuator

This manual is valid for the valve ordering number(s):  
57124- . E02/05/07/08

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 57.1, DN 16 (I.D. 5/8")**

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**Imprint:**

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## 1 Use of product

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

### 1.1 Technical data

Leak rate: body, seat	$< 1 \cdot 10^{-10}$ mbarls <sup>-1</sup>
Pressure range	extreme UHV to 5 bar (abs)
Differential pressure on the gate	5 bar in either direction
Max. differential pressure at opening	5 bar in either direction (with reduced cycle life time)
Admissible temperature: Valve open (incl.actuator)	$\leq 450^{\circ}\text{C}$
Valve closed (incl.actuator)	$\leq 350^{\circ}\text{C}$
Position indicator	$\leq 80^{\circ}\text{C}$ (option: $200^{\circ}\text{C}$ )
Position indicator: Contact rating	$\leq 50$ V AC / DC; $\leq 1.2$ A ( $80^{\circ}\text{C}$ version) $\leq 50$ V AC / DC; $\leq 1$ A ( $200^{\circ}\text{C}$ version)

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

## 2 Installation



Handling of the valve must take place under clean conditions normally observed in good vacuum practice. The valve may only be touched with clean gloves. After the protective covers have been removed, the sealing surfaces of the flanges have to be cleaned carefully with alcohol. The screws of the flanges have to be tightened uniformly in diagonal crosswise order. Determine that the valve and existing plumbing in the vacuum system will be adequately supported.

### Admissible forces

The valve must not support other components and has to be protected from forces of the system (e.g. by bellows sections).

## 2.1 Electrical connection (valves with position indicator)



Do not touch electrical parts under voltage!

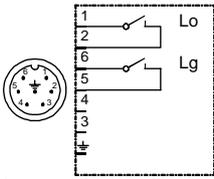
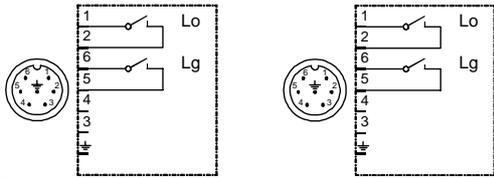
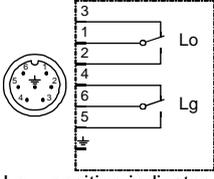
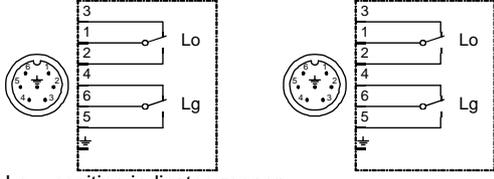


Connect electrical power only if  
 - valve is installed into the vacuum system  
 - moving parts cannot be touched

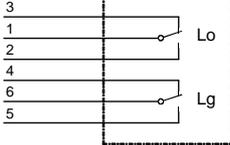
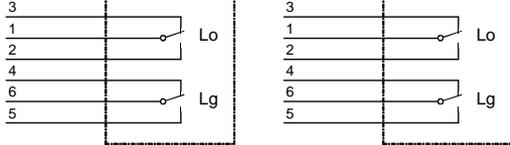
The suitable sockets are supplied with the valve.

Wiring diagrams:

### 2.1.1 Position indicators for max. 80°C — contact rating ≤ 50 V AC / DC; ≤ 1.2 A

	<p>Standard position indicator with make contact switches</p>  <p>Lo = position indicator «open»                  Lg = position indicator «closed»</p>	<p>Double position indicator with make contact switches - two each (option)</p>  <p>Lo = position indicator «open»                  Lg = position indicator «closed»</p>
	<p>Position indicator with double throw switches (option)</p>  <p>Lo = position indicator «open»                  Lg = position indicator «closed»</p>	<p>Double position indicator with double throw switches - two each (option)</p>  <p>Lo = position indicator «open»                  Lg = position indicator «closed»</p>

### 2.1.2 Position indicators for max. 200°C and 300°C — contact rating ≤ 50 V AC / DC; ≤ 1 A

	<p>Single position indicator (option)</p>  <p>Lo = position indicator «open»                  Lg = position indicator «closed»</p>	<p>Double position indicator (option)</p>  <p>Lo = position indicator «open»                  Lg = position indicator «closed»</p>
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### 3 Operation

#### 3.1 Normal operation

Opening of closed valve

- turn hexagon head counter clockwise to it's stop. The valve is completely open when the stop is reached.

Closing of open valve

- turn hexagon head clockwise to it's stop. The valve is completely closed and leaktight when it's mechanical stop is reached.



#### **Don't overtorque!**

The sealing force of the valve can't be increased with a higher torque. The force to seal the valve is supplied by a spring. The mechanical stop is reached before the spring is completely loaded.

	Nominal I.D. (DN)
	DN 16
Hexagon head wrench size	13mm
Cylindrical head diameter	Ø10mm
required torque for closing * (adjusted by VAT)	4 Nm

\* May slightly rise due to bakeouts.

Valves with hexagon head may be operated by ring or fork wrench or by using a hand wheel (see spare parts list).  
 Valves with cylindrical head have to be operated by a hand wheel with free wheel option (see spare parts list).

#### 3.2 Bake-out

- Valve open (incl.actuator) ≤ 450°C
- Valve closed (incl.actuator) ≤ 350°C
- Position indicator: ≤ 80°C (option: ≤ 200°C)
- Heating and cooling rate: ≤ 60°C/h

Temperature differences exceeding 60°C throughout the valve are not allowed. They may affect the performance of the valve.



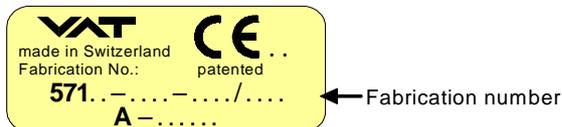
## 4 Trouble shooting

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 Readjustment of sealing force

- Close the valve to mechanical stop
- Remove slotted rollpin (together with dowel pin) at the hexagon head
- Turn the hexagon head slightly counter clockwise back by one hole
- Press in slotted rollpin (together with dowel pin) again
- close the valve to mechanical stop

### 5.2 Instruction how to change the VATRING (Don't touch inside valve parts without gloves)

The item numbers refer to the drawing on page 9.

- Open the valve and loosen bonnet screws (68)
- Remove valve insert and bonnet seal (36/2)
- When loosening and tightening the screw (67) protect the bellows against torsion with flat SW13 on the plate
- Remove VATRING
- Take a lint free tissue dabbed with alcohol and clean all sealing surfaces (plate, bonnet, body - seat and bonnet, VATRING)
- Check sealing surfaces (visually) for scratches
- Clean VATRING and plate with cleaned and dry compressed air
- Place VATRING on sealing surface of the plate
- Place holding ring on top of plate
- Align VATRING parallel with the front of the plate
- Insert screw (67), protect bellows against torsion with a flat SW13 on the plate, tighten screw with a torque of 2,5Nm
- Place new bonnet seal (36/2) exactly like shown on next page (fitting position) !
- Put valve insert with actuator in open position back into valve body and tighten bonnet screws (68) in diagonal crosswise order with a torque of 7Nm.

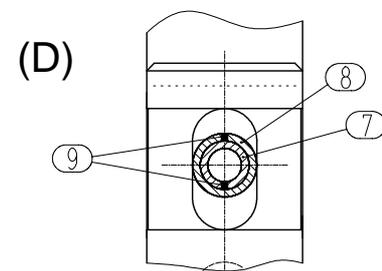
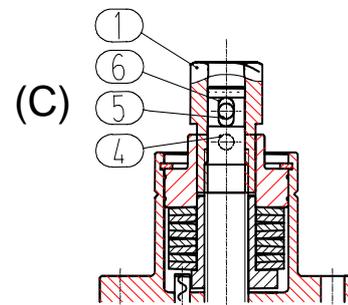
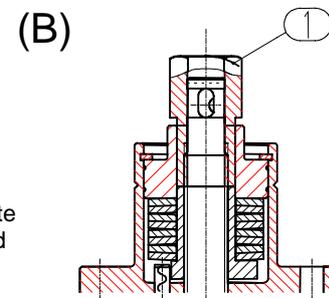
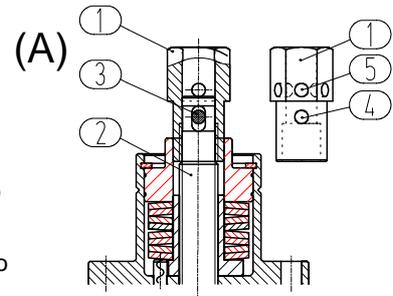
### 5.3 Adjustment of closing torque / assembly hexagon head (valve insert installed in the valve body)

**Figure 2**

#### New actuator components:

Note this procedure works only for unused actuator components. As soon as the parts are baked the required closing torque will raise and the torque adjustment would end in a to small sealing force.

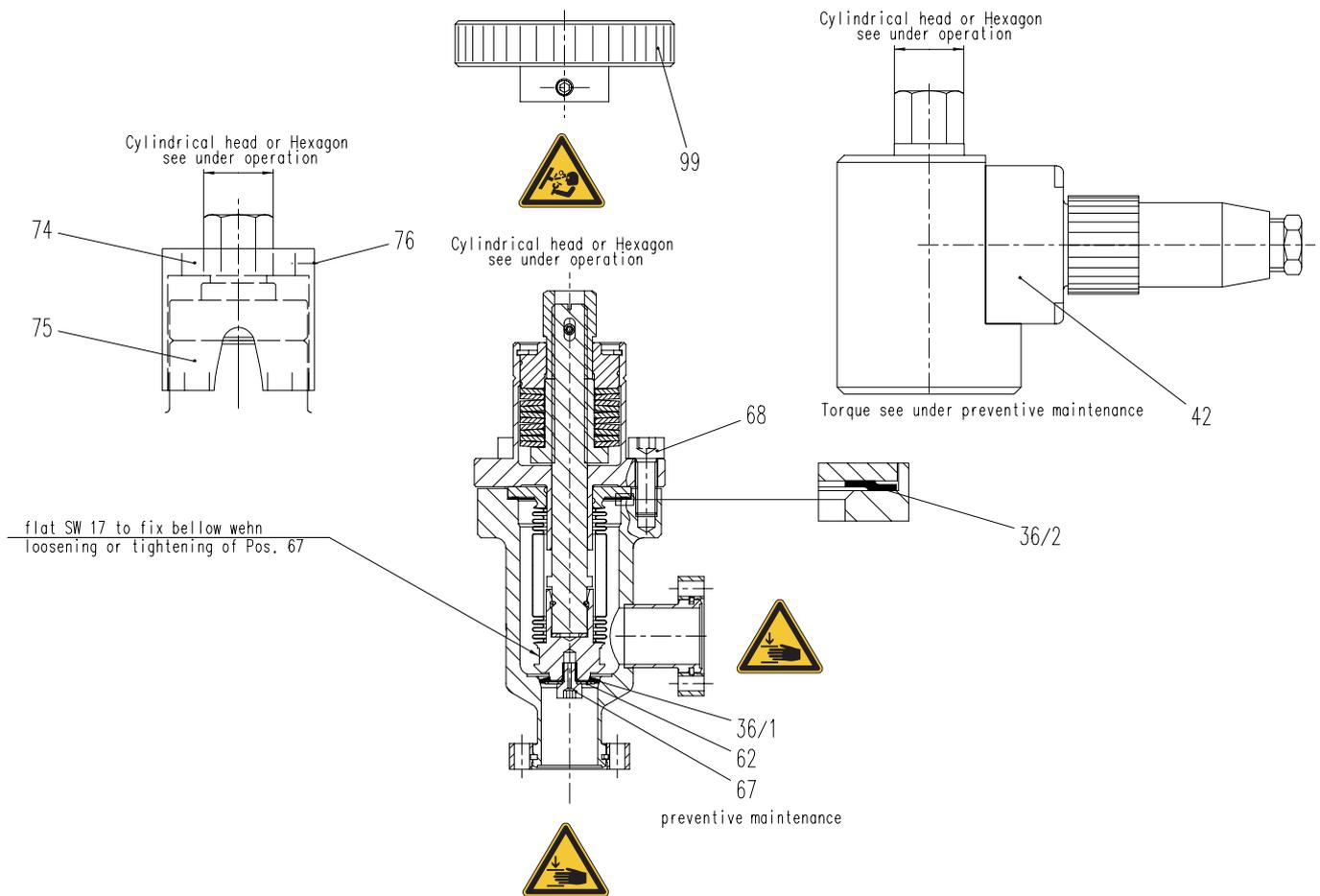
- Place hexagon head (1) – (Fig. 2A) - on the spindle (2) and fix it with a pin (3)  $\varnothing$  3mm at the diameter 13 mm
- Close the valve and do 10 cycles with a torque of 3.5 to 4Nm. Then go back to open position
- Close the valve with a torque of 3 - 3.5 Nm
- Remove the pin (3)  $\varnothing$  3mm, now turn by hand the hexagon head (1) clockwise to its mechanical stop - (Fig. 2B).
- Turn the hexagon head (1) slightly counter clockwise until the first hole (5) of hexagon head (1) reaches the slot of the spindle (6) - (Fig. 2C)
- Put dowel pin (7) into slotted rollpin (8) so that the slits (9) of them are opposite to each other. Then press them as one piece trough the hole of hexagon head (5) and slot in the spindle (6) - (Fig. 2D)



#### Already used (and baked) actuator components:

- First measure required closing torque to come to mechanical stop
- Perform repair work (eg. Replace VATRING)
- Assemble valve again
- Release hexagonal head
- Place hexagon head (1) - (Fig. 2A) - on the spindle (2) and fix it with a pin (3)  $\varnothing$  3mm at the diameter 13 mm
- Close the valve with previous measured closing torque
- Remove the pin (3)  $\varnothing$  3mm, now turn by hand the hexagon head (1) clockwise to its mechanical stop - (Fig. 2B)
- Turn the hexagon head (1) slightly counter clockwise until the first hole (5) of hexagon head reaches the slot of the spindle (6) - (Fig. 2C)
- Put dowel pin (7) into slotted rollpin (8) so that the slits (9) of them are opposite to each other. Then press them as one piece trough the hole of hexagon head (5) and slot in the spindle (6) - (Fig. 2D)

## 6 Drawing





## 7 Spare parts

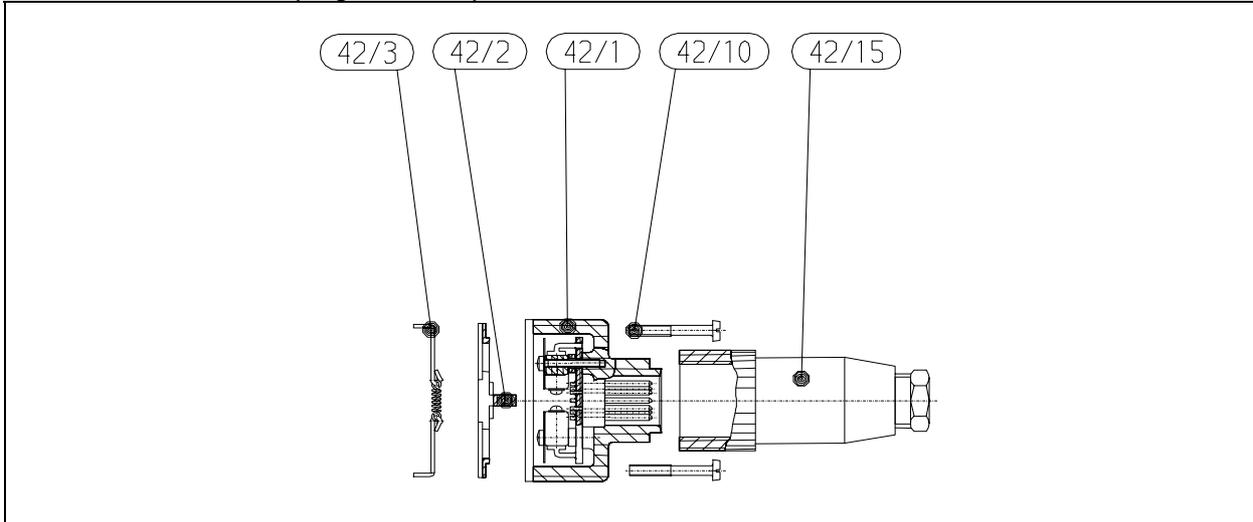


Please specify the **fabrication number of the valve** (see yellow label on valve) when ordering spare parts. This is to ensure that the appropriate spare parts are supplied.

The item numbers refer to the drawing on the page 10.

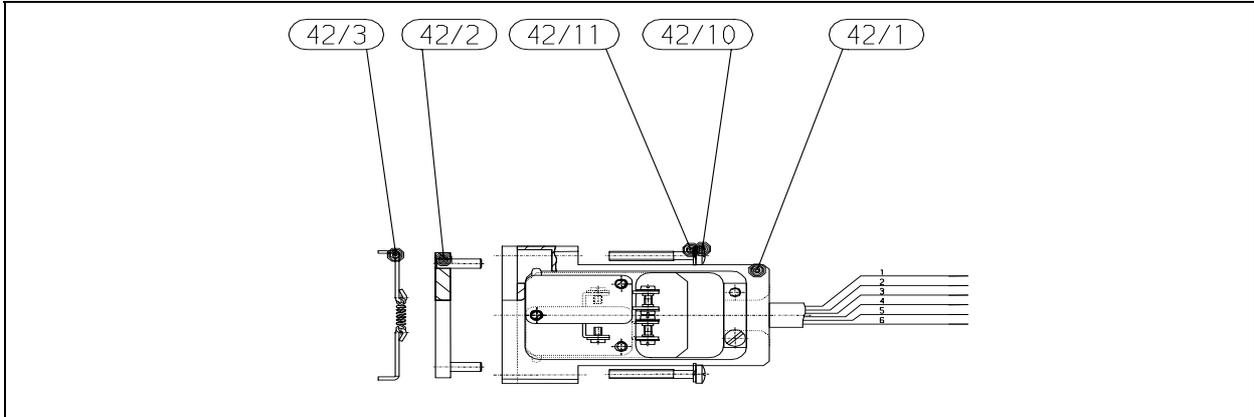
Item	Description	Qty	Part / Ordering number
			DN 16
36/1	VATRING	1	38891-01
36/2	Bonnet seal	1	209150
62	Holding ring	1	94973-01
67	Screw with venting hole	1	217507
68	Treated hexagon socket head cap screw	6	N-5019-788
99	Hand wheel for hexagon head	1	219032
99	Hand wheel for cylindrical head	1	219033
74	Ring	1	235259
75	Scale	1	235260
76	Screw	5	N-6071-444
	Vacuum seal kit, consisting of VATRING and bonnet seal	1	(216767)

**Position indicators 80°C (single + double) in various versions**



Item	Description	Version	Qty.		Part No.
			single	double	
42	BS Mini position indicator	make contact switches	1	2	69250-R1
		double throw switches	1	2	75430-R1
		make contact radiation resistant	1	2	90471-R1
		double throw radiation resistant	1	2	91701-R1
42/1	Position indicator	make contact switches	1	2	71852-R1
		double throw switches	1	2	70606-R1
		make contact radiation resistant	1	2	80075-R1
		double throw radiation resistant	1	2	83954-R1
42/2	Slider		1	2	69846-01
42/3	Driving piece		1	2	69428-R1
42/10	Screw		4	8	N-6016-078
42/15	Socket		1	2	N-8504-002

**Position indicators 200°C + 300°C (single + double)**



Item	Description	Version	Qty.		Part No.
			single	double	
42	BS Mini position indicator	double throw switches 200°C	1	2	69670-R1
		double throw switches 300°C	1	2	91702-R1
42/1	Position indicator	double throw switches 200°C	1	2	69664-R1
		double throw switches 300°C			91703-R1
42/2	Slider		1	2	70279-R1
42/3	Driving piece		1	2	69428-R1
42/10	Screw		4	8	N-6024-531
42/11	Spring ring		4	8	N-6160-406

## 8 Warranty

Each product sold by VAT Vakuumentile 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.

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