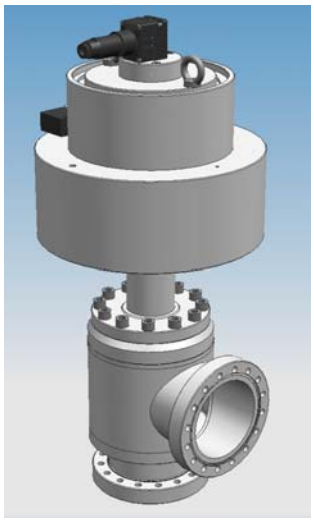
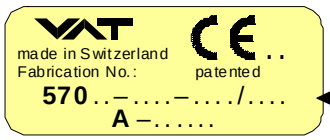
All-Metal Angle Valve

Single acting pneumatic actuator with closing spring



This manual is valid for the valve ordering number(s):
57040 - . E11/21/31/41
57044 - . E11/21/31/41

The fabrication number is indicated on each product as per the label below (or similar):



Explanation of symbols:


Read declaration carefully before you start any other action!


Attention!


Product is in conformity with EC guidelines, if applicable!


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


Keep body parts and objects away from the valve opening!


Hot surfaces; do not touch!


Loaded springs and/or air cushions are potential hazards!


Wear gloves!


Read these **«Installation, Operating & Maintenance Instructions»** and the enclosed **«General Safety Instructions»** carefully before you start any other action!

Imprint:

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Series 570, DN 100 – 160 (I.D. 4" – 6")

Contents:

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^{-1}
Pressure range	(T=200°)	extreme UHV to 5 bar (abs)
	(T=450°)	extreme UHV to 3.5 bar (abs)
Differential pressure on the gate		
-in closing and opening direction		≤ 5 bar
Max. differential pressure at opening		
-in closing and opening direction		1 bar (any differential pressure at opening might reduce the lifetime of the valve)
Admissible temperature: Valve body		
	-open	≤ 450°C
	-closed	≤ 350°C
	Pneumatic actuator	≤ 150°C (option: radiation resistant E6Gy 140°C)
	Position indicator	≤ 80°C (option: 200°C)
	Solenoid	≤ 80°C
Position indicator: Contact rating		≤ 50 V AC / DC; ≤ 1.2 A (80°C version) ≤ 50 V AC / DC; ≤ 1 A (200°C version)

Further information see VAT catalogue «Vacuum Valves 2012».

2 Installation

2.1 Unpacking

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.

2.2 Installation into the system

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

2.3 Connections

2.3.1 Compressed air connection

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

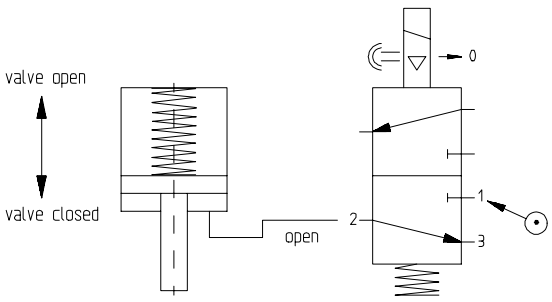
Attention: Check if the circlip connecting the lid to the cylinder is in the proper position.

Connection: internal thread R 1/8" (1/8" NPT for USA)

Connection for compressed air supply: ⊙

Compressed air pressure (min. - max. overpressure): 6 - 9 bar / 85 - 130 psig

Use only clean, dry or slightly lubricated air!



Without solenoid

Connection «open» for air supply

With solenoid

Connection «1» for air supply, connections «3» for exhaust

2.3.2 Electrical connection

Do not touch electrical parts under voltage!

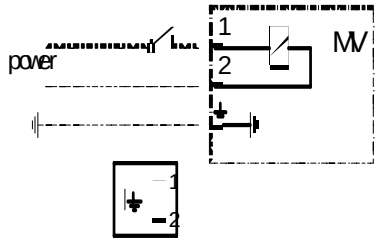
Connect electrical power only if
- valve is installed into the vacuum system
- moving parts cannot be touched

Verify that mains voltage matches voltage stated on the solenoid!

Sockets for position indicator and solenoid are supplied with the valve.

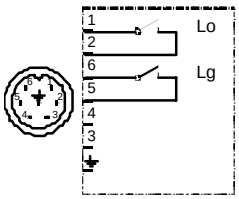
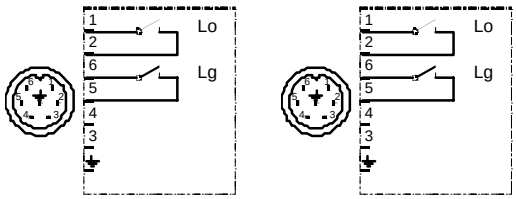
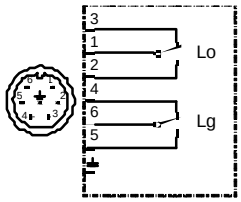
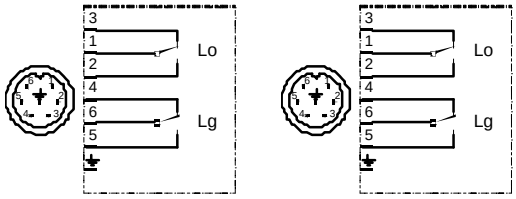
Wiring diagrams:

Solenoid



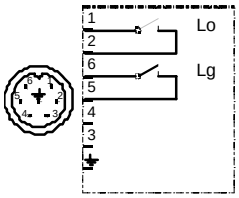
MV = coil of solenoid

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

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

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

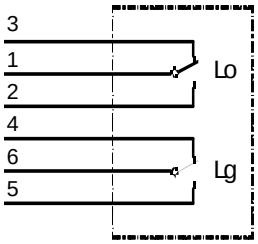
Position indicator radiation resistant 10E6Gy with make contact switches



Lo = position indicator «open»
Lg = position indicator «closed»

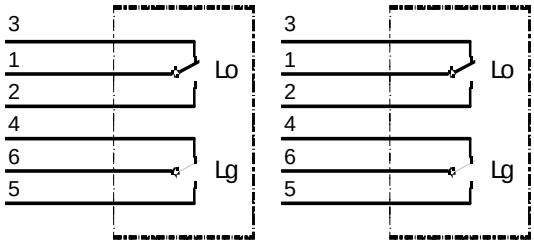
Position indicators for max. 200°C — contact rating ≤ 50 V AC / DC; ≤ 1 A

Single position indicator with double throw switches (option)



Lo = position indicator «open»
Lg = position indicator «closed»

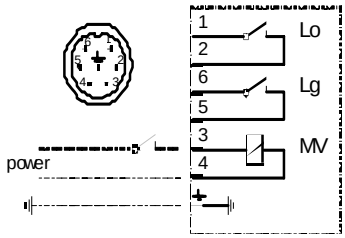
Double position indicator with double throw switches (option)



Lo = position indicator «open»
Lg = position indicator «closed»

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

Common plug for pos. indicator and solenoid, pos. indicator with make contact switches (option)



Lo = position indicator «open»
Lg = position indicator «closed»

3 Operation

3.1 Normal operation

Opening of closed valve

- without solenoid:
  - air supply to conection plate ⊙
- with solenoid:
  - supply specified control voltage to the coil

Closing of open valve

- without solenoid:
  - air release through connection plate ⊙
- with solenoid:
  - release control voltage

Attention! Acertain that the circlip connecting the lid to the cylinder is correctly in place. Even with disconnected supply, loaded springs and/or air cushions in cylinders can be potential hazards.

3.2 Operation under increased temperature

See «1.1 Technical data»

Heating/cooling rate: max. 60°C/h

Operate the valve only after the bakeout temperature has been stable for two hours. If actuation during bake-out is required, the heating and cooling rate from 200°C to 450°C must not exceed 30°C/h.

Temperature differences exceeding 30°C throughout the valve are not allowed. They may affect the performance of the valve.

3.2.1 Bake-out

Valve:	≤	450°C in opened position, ≤ 350°C in closed position
Actuator:	≤	150°C
Position indicator:	≤	80°C (option: ≤ 200°C)
Solenoid	≤	80°C
Heating and cooling rate:	≤	60°C/h

Operate the valve only after the bake-out temperature has been stable for two hours. If actuation during bake-out is required, the heating and cooling rate from 200°C to 450°C must not exceed 30°C/h.

Temperature differences exceeding 30°C throughout the valve are not allowed. They may affect the performance of the valve.

3.3 Behavior in case of compressed air pressure drop

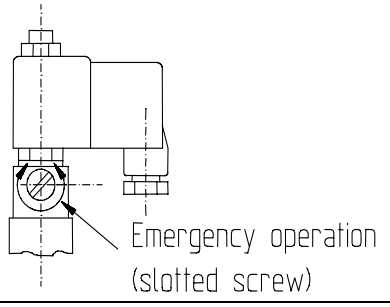
Valve closed: valve stays closed
Valve open: valve closes

3.4 Behavior in case of power failure

Valve closes if solenoid is currentless.

3.5 Emergency operation at power failure

Solenoids is provided with a slotted screw to operate the valve in case of a power failure (with compressed air available)

Standard solenoid To close the valve: Turn the slotted screw counter-clockwise to its stop To open the valve: Turn the slotted screw clockwise to its stop For remote operation make sure that the slotted screw is turned counter-clockwise to its stop.	

4 Trouble shooting

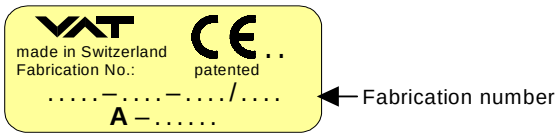
Failure	Check	Action
Valve mechanism does not move	Compressed air available?	Check air pressure!
	Power available?	Check voltage!
	Slotted screw of solenoid in proper position?	Check position of slotted screw.

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.

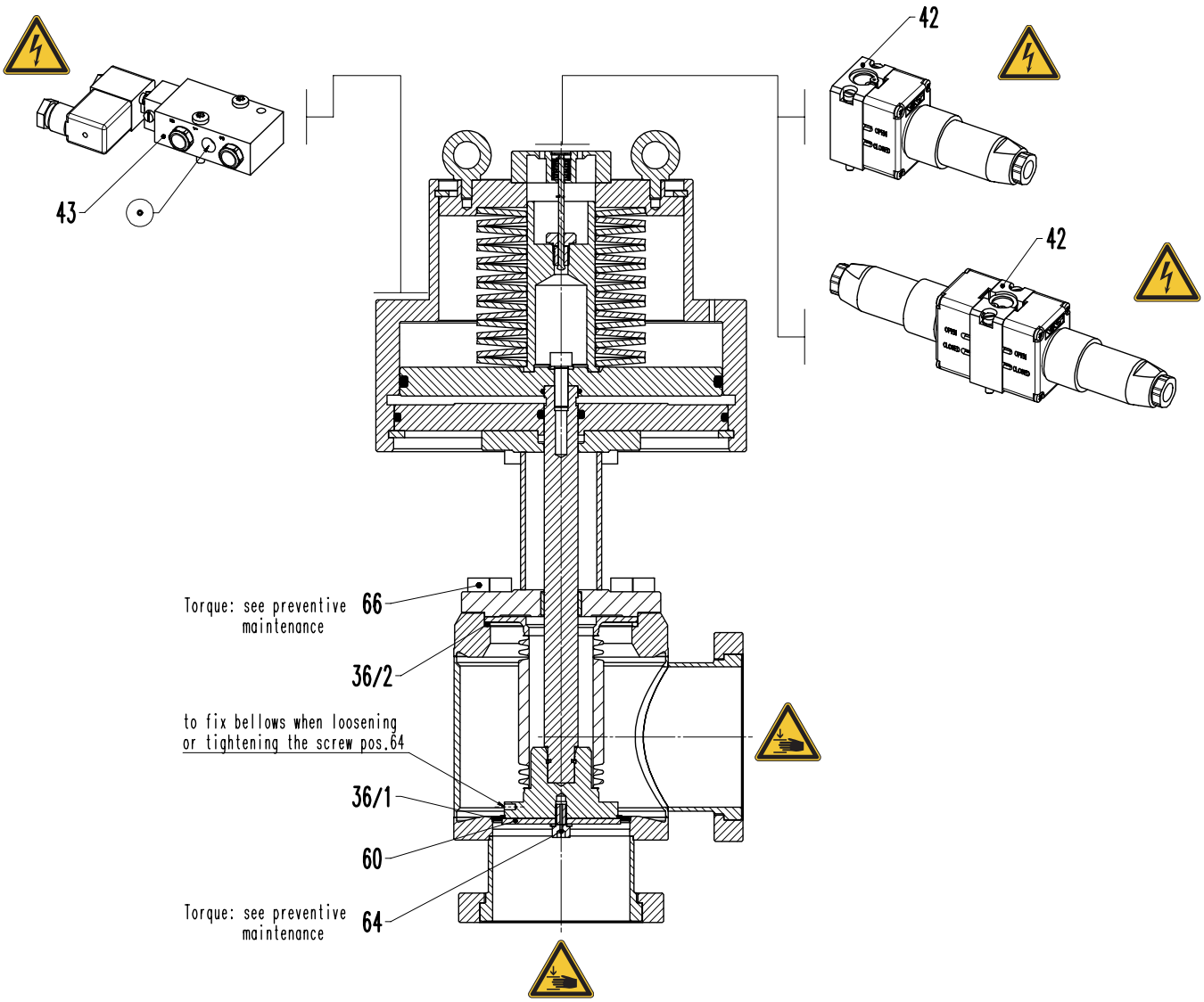
Even with disconnected supply, loaded springs and/or air cushions in cylinders can be potential hazards.

Keep fingers and objects away from the valve opening!

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

Nominal I.D. (DN)	DN 100 / DN 160
closing torque of screw with venting hole (pos. 64)	15 Nm
closing torque of bonnet screw (pos. 66)	35 Nm

6 Drawing


42
43
42
Torque: see preventive maintenance
66
36/2
to fix bellows when loosening or tightening the screw pos.64
36/1
60
Torque: see preventive maintenance
64

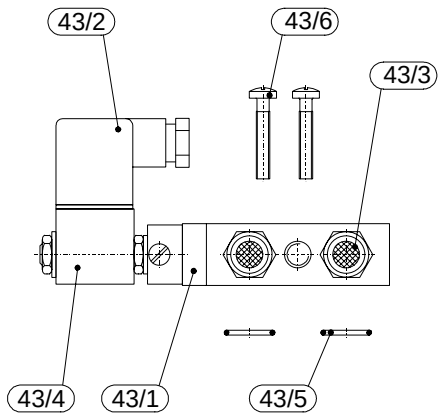
7 Spare parts

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 page 11.

Item	Description	Qty	Part / Ordering number	Part / Ordering number
			DN 100	DN 160
36/1	VATRING	1	39986-01	35774-01
36/2	Bonnet seal	1	51914-08	213816
36	Vacuum seal kit, consisting of VATRING and bonnet seal	1	83921-R1	215875
37	Pneumatic seal kit, consisting of all elastomer seals inside the pneumatic actuator: Standard 200°C actuator for 10^6 Gy (option)		 231928 514379	 215866 -
60	Holding ring	1	99914-01	213794
64	Screw with venting hole	1	214314	214314
66	Treated hexagon socket head cap screw	12 16	N-5019-839	 N-5019-839

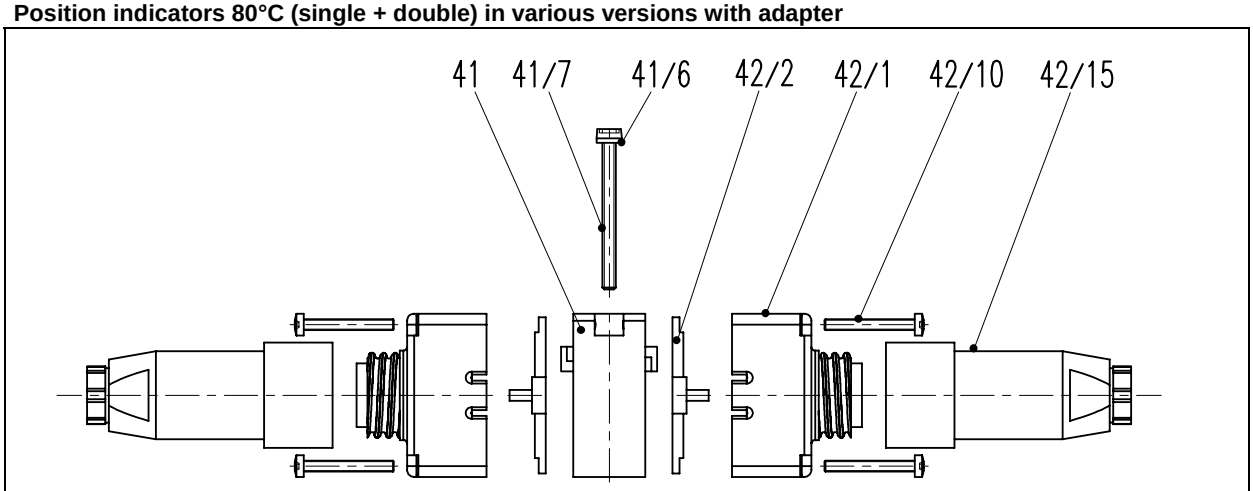
Solenoid kit (5/2-way standard)



Item	Description	Qty.	Part No.
43	Solenoid kit	1	80993-R1
43/1	Solenoid	1	N-7501-502
43/2	Socket	1	N-8501-300
43/3	Sound absorber	2	N-7705-001
43/4	Coil**	1	N-7510-2**
43/5	O-ring	2	N-7100-016
43/6	Screw	2	N-6024-562

) **Specify voltage! (e.g. N-7510-2-**220V 50Hz**)

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



Item	Description	Version	Qty.		Part No.
			single	double	
41	Adapter complete		1		72228-R1
				1	83923-R1
41/6	Spring ring		2	2	N-6162-404
41/7	Screw		2	2	N-6016-503
42	BS Mini position indicator	make contact switches	1	2	76664-R1
		double throw switches	1	2	85399-R1
		make contact radiation resistant	1	2	80074-R1
		double throw radiation resistant	1	2	83953-R1
		make contact switch with common plug for pos. indicator and solenoid	1	-	87997-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
		make contact switch with common plug for pos. indicator and solenoid	1	-	82560-R1
42/2	Slider		1	2	69846-01
42/10	Screw		4	8	N-6024-531
42/15	Socket		1	2	N-8504-002
	Cable socket, snaked		1	2	N-8504-005

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.