Pendulum Control & Isolation Valve

with stepper drive actuator

This manual is valid for the valve ordering numbers:
650 . . - . . 52- . . . .

The respective product identification is given on each valve in the following or in a similar way:

made in Switzerland
Fabrication No.:
patented
F65 – . . . . . / . .
650 . . – . A52 – . . . .

Explanation of symbols:

Read declaration carefully before you start any other action!

Attention!

Product is in conformity with EC guidelines,

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!

Intended use of product

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

Corrosive process gases may impact the performance of the product. Please contact VAT to assure that the product is compatible with the process gases used in your application.

Technical data

Pressure range		1 x 10^{-8} mbar to 1.2 bar (abs)
Differential pressure on the gate		1.2 bar in either direction
Max. differential pressure during opening (higher pressure on seat side)		DN 100: 30 mbar DN 320: 10 mbar
Admissible temperature:	Valve	20°C to 120°C
	Actuator	20°C to 60°C
Operation		only with VAT PM-7 or PM-6 Adaptive Pressure Control and VAT connection cable

Please refer to the product data sheet D65001EA for additional technical information.

Installation into the vacuum system

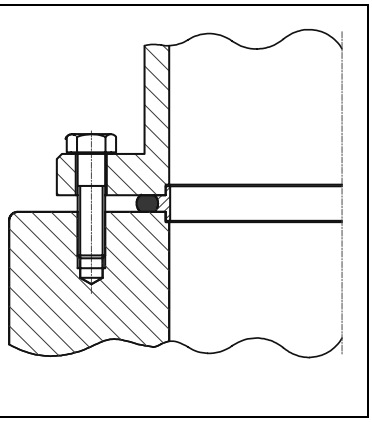
The valve seat side is indicated by the symbol "∇" on the connection flange.

Tightening torque for mounting screws on flanges

1. Mounting with centering ring

Tighten mounting screws of the flanges uniformly in crosswise order. Observe the maximum torque levels in the following table. Higher tightening torques deform the valve body and can lead to an improper function of the valve.

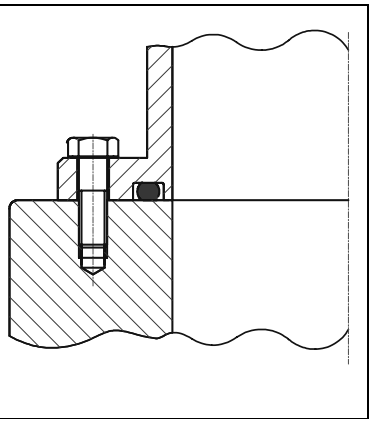
DN		max. tightening torque (Nm)			max. tightening torque (lbs . ft)		
mm	inch	ISO-F	JIS	ASA-LP	ISO-F	JIS	ASA-LP
63/100	4	8 – 10	8 – 10	8 – 10	6 – 8	6 – 8	6 – 8
160	6	13 – 15	13 – 15	20 - 30	9 - 11	9 - 11	15 – 22
200	8	13 – 15	13 – 15	20 - 30	9 - 11	9 - 11	15 – 22
250	10	17 – 20	17 – 20	40 – 60	13 – 15	13–15	30 – 44
320	12	17 - 20	17 – 20	40 - 60	13 – 15	13–15	30 - 44



2. Mounting with O-ring in groove

Tighten mounting screws of the flanges uniformly in crosswise order. Observe the maximum torque levels in the following table. Higher tightening torques may damage the threads in the valve body and can lead to an improper function of the valve.

DN		max. tightening torque (Nm)			max. tightening torque (lbs . ft)		
mm	inch	ISO-F	JIS	ASA-LP	ISO-F	JIS	ASA-LP
63/100	4	20-23	35-40	35-40	15 - 17	26 - 30	26 - 30
160	6	35-40	35-40	35-40	26 - 30	26 - 30	26 - 30
200	8	35-40	35-40	80-90	26 - 30	26 - 30	59 - 67
250	10	35-40	65-70	80-90	26 - 30	48 - 52	59 - 67
320	12	65-70	65-70	80-90	48 - 52	48 - 52	59 - 67

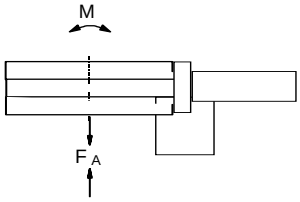


Admissible forces

Forces from evacuating the system, from the weight of other components, and from baking can lead to deformation and malfunctioning of the valve. Stress has to be relieved by suitable means, e.g. bellows sections.

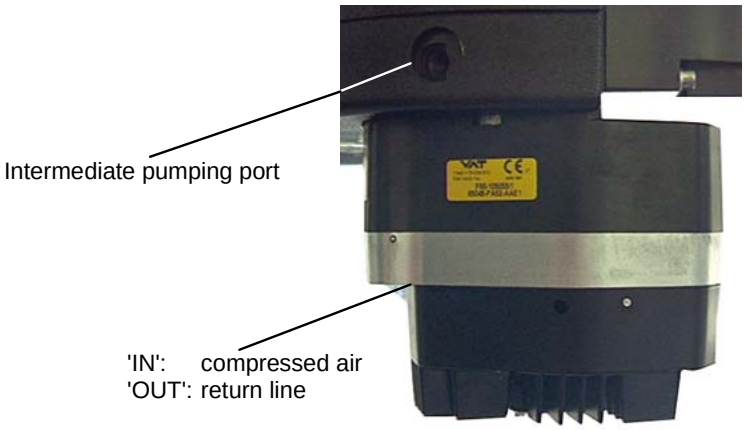
DN (nom. I.D.)		Axial tensile or compressive force «F_A»		Bending moment «M»	
mm	inch	N	lb	Nm	lbf
100	4	1000	220	40	30
320	12	3000	660	120	90

For a combination of both forces (F_A and M) the values are invalid.
Verify that the depth of the mounting screws is max. 1 x thread diameter.
Please contact VAT for more information.



Installation procedure

1. Install control valve on vacuum chamber (the symbol "∇" on the flange indicates the side of the valve seat)
2. Connect compressed air: - Connections are internal threads R 1/8“ (NPT for USA)
   - Use only clean, dry or slightly oiled air
   - Compressed air pressure (above atm): 4-7 bar / 56 - 98 psi
   - Connect compressed air supply to actuator connection labelled ‘IN’
   - Connect compressed air return line to actuator connection labelled ‘OUT’
3. Attach connection cable to PM-6 or PM-7 Adaptive Pressure Controller
4. Install PM-6 or PM-7 contoller according to the manual for the PM-6 or PM-7 controller
5. Connect heating device and temperature controller according to appendix 1
6. Option: Connect vacuum line to intermediate pumping port ($R^1/_8$") of rotary feedthrough



Operation

Operation is allowed only after the installing procedure.

The PM-6 or PM-7 control unit has to be turned off for at least 10 seconds before connecting or disconnecting the cable to the valve. Please refer to the IOMI of the PM-6 or PM-7 Adaptive Pressure Controller for details.

Admissible temperature

See «Technical data»!

Differential pressure

Do not operate the valve, if the pressure on the seat side of the gate is equal or higher than the value given in the following table:

	Max. differential pressure during operation (higher pressure on seat side)
DN 100	30 mbar
DN 320	10 mbar

Compressed air failure

Valve closed:	no change
Valve open or control position:	undefined

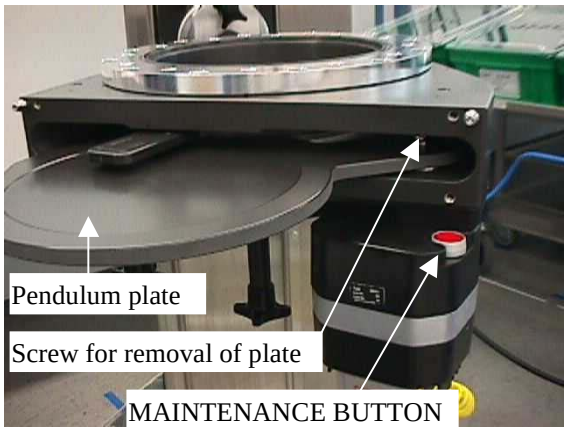
Power failure

	with power-fail option	without power-fail option
Valve closed:	no change	no change
Valve open or control position:	will close	undefined

Preventive maintenance

Disassembly of plate and locking ring

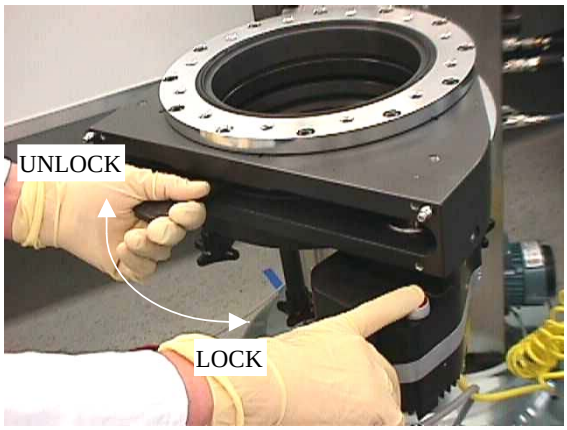
1. Vent both valve chambersGive 'OPEN' command on PM control unit to bring pendulum plate to OPEN position
2. Open bonnet screws and remove bonnet cover
3. Unfasten mounting screw for pendulum plate, use 13 mm wrench
4. Remove pendulum plate
5. With one hand press MAINTENANCE BUTTON and lower the locking ring assembly, with your second hand unlatch locking ring by pressing the handle to the RIGHT.
6. Release MAINTENANCE BUTTON
7. Remove locking ring



Cleaning and Lubricating

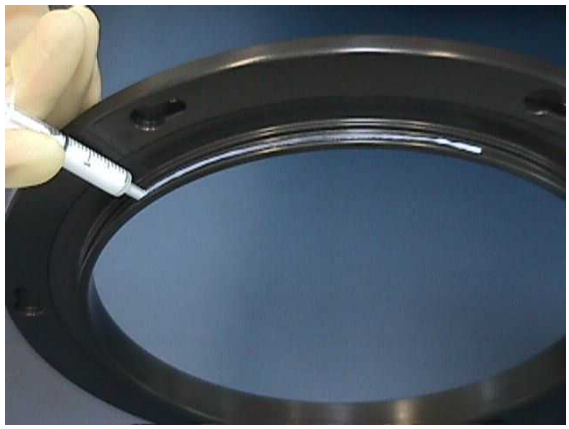
1. Clean the valve parts
2. Install the gate o-ring without grease
3. Lubricate the groove of the body o-ring. Pay attention that the following quantity of grease is distributed constant on the hole circumference.

DN	Quantity of grease [ml]
63/100	0.2
320	0.5



4. Lubricate the body o-ring with the following quantity of grease

DN	Quantity of grease [ml]
63/100	0.1
320	0.3



5. Install body o-ring

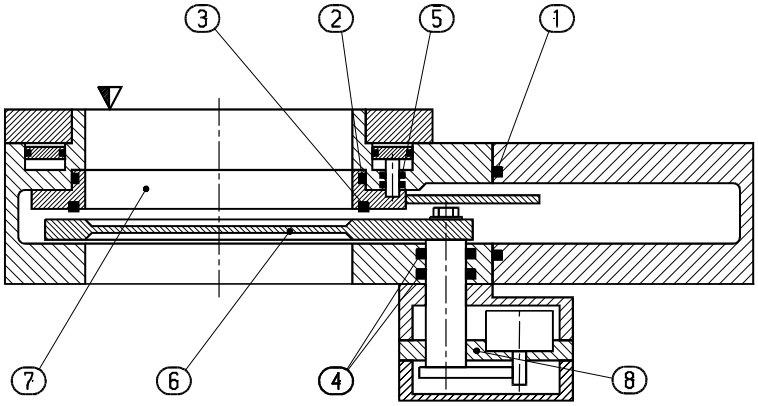
Reassembly

Works the reverse way as disassembly.
Tightening torque for bonnet screws:

DN	max. torque [Nm]
63/100	6
320	16

Frequency of cleaning and replacement of seals depends on the process conditions. Please refer to the spare parts list for ordering information.

Spare parts



Pos.	Description			
	Valve size **Valve part number**		**DN63-100** **65036(40)- . . 52-**	**DN320** **65050- . . 52-**
1	Bonnet seal		N-5100-259	N-5100-279
2	Body seal (+syringe of grease 2ml) VITON ULTIC Armor		 204884 234458	 206529 -
3	Gate seal VITON ULTIC Armor Kalrez 4079 Chemraz 513		 N-5100-155 234061 216646 N-5106-155	 N-5100-279 - - -
4	Seals actuator feedthrough		N-5111-329 (2x)	N-5100-336 (2x)
5	Seals for locking ring feedthrough		N-5111-112 (12x)	N-5111-112 (24x)
6	Pendulum plate blank hardanodized 	 B1 B2 B1 B2	 91048-01 - 100741-01 -	 211275 211276 96603-01 98378-01
7	Locking ring blank hardanodized		 216490 217050	 230236 229310
8	Actuator	B1 B2	98800-R1 227048	240532 240533
	seal kit vacuum; syringe of grease, item 2 and 3 Viton		204883	206528
	seal kit vacuum; syringe of grease, item 2 Viton, item 3 Kalrez 4079		235115	-
	seal kit vacuum; syringe of grease, item 2 Viton, item 3 Chemraz 513		235113	-

Pos.	Description			
	Valve size **Valve part number**		**DN63-100** **65036(40)- . . 52-**	**DN320** **65050- . . 52-**
	syringe of grease	2ml	206792	
		5ml	206793	

Note: Use only spare parts manufactured by VAT to assure safe and reliable operation!

Trouble shooting

Valve does not close/open/control	- Is valve cable connected correctly? - Check power to PM control - Check compressed air pressure
Pressure control does not work	- Please refer to the IOMI for PM contol unit
Leak at gate	- Clean pendulum plate and locking ring - Check seal surface on valve, pendulum plate and O-ring seals on locking ring - Change O-rings, if necessary
Leak at body	- Flanges leaktight? - Bonnet seal leaktight? - Screws at bonnet tightened properly? - He leak check at access ports for rotary seal or shaft seals Please contact your VAT service center for repairs of leaks at rotary seals or shaft seals.

Repairs

Contact VAT for repairs or maintenance. The fabrication No. (650 . . - . . . . - . . . . / . . . .) marked on the valve body has always to be specified. It is individually decided whether the repair can be performed by the customer or has to be carried out by VAT.

1. Turn off power to the control unit and wait for 10 seconds.
2. Disconnect the cable to the valve.
3. Disconnect compressed air.
4. Remove valve from the system.

Products returned to VAT for repair have to be free of harmful substances such as e.g. toxical, caustic or microbiological ones. For radioactively contaminated products the customer has to fill in the VAT form «Contamination and Radiation Report» and to send it with the product. The form is available at VAT. The maximum permissible values indicated in the form must not be exceeded.

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 one-year period 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.