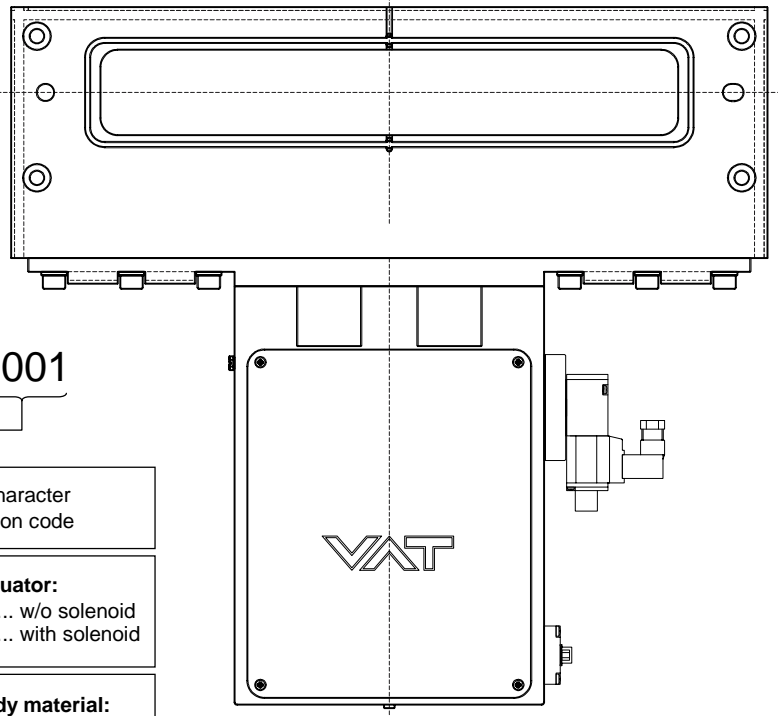


Rectangular Gate Valve MONOVAT classic

- with pneumatic actuator
 double acting

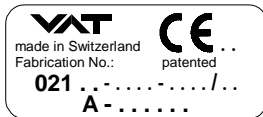


0 2 1 1 0 - B A 2 4 - 0001

Size	4 character option code
09 ... 32 x 222	Actuator: 24 ... w/o solenoid 44 ... with solenoid
10 ... 46 x 236	
12 ... 50 x 336	Body material: A ... aluminum E ... stainless steel
01 ... 25 x 160	
02 ... 25 x 210	
03 ... 25 x 265	
04 ... 25 x 420	
05 ... 51 x 160	
06 ... 51 x 210	
07 ... 51 x 265	
08 ... 51 x 420	

Flange type
A ... Same size of opening on seat side and rear side. With bonnet flange, gate service via bonnet flange.
B ... Opening on rear side larger than on seat side. With bonnet flange, gate service via bonnet flange.

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



STOP

Read these «**Installation, Operating and 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.

Description

Flange	see dimensional drawing
Actuator	pneumatic, double acting, with position indicator, mechanically locked in closed position
Feedthrough	welded metal bellows *)

Technical Data

Leak rate (FKM seals)	
- valve body	$< 1 \cdot 10^{-9} \text{ mbar l s}^{-1}$
- seat	$< 1 \cdot 10^{-9} \text{ mbar l s}^{-1}$
Leak rate (FFKM seals)	
- valve body	$< 1 \cdot 10^{-8} \text{ mbar l s}^{-1}$
- seat	$< 1 \cdot 10^{-7} \text{ mbar l s}^{-1}$
Pressure range	$1 \cdot 10^{-9} \text{ mbar to } 1.2 \text{ bar (abs)}$
Differential pressure on the gate	
- in either direction	1.2 bar *)
Differential pressure at opening	$\leq 30 \text{ mbar *)}$
Cycle life between maintenance	
- actuator	2 million *)
- bellows (under clean vacuum conditions)	2 million *)
- gate seal FKM (under clean vacuum conditions)	2 million
- gate seal FFKM (under clean vacuum conditions)	1 million
Operating temperatures	
- valve body aluminum	$< 150^{\circ}\text{C}$
- valve body stainless steel	$< 200^{\circ}\text{C}$
- pneumatic actuator	$< 150^{\circ}\text{C}$
- position indicator	$< 80^{\circ}\text{C}$
- solenoid	$< 50^{\circ}\text{C}$
Temperature difference between seat and gate	$\leq 40^{\circ}\text{C}$
Heating and cooling rate	$\leq 40^{\circ}\text{C h}^{-1}$
Material	



Installation, Operating, and Maintenance Instructions Series 021

- valve body, gate aluminum	3.2315, AA6081, AlMgSi1
- valve body, gate stainless steel	1.4435, AISI 316L
- bellows end pieces	1.4435, AISI 316L
- bellows	AISI 633 (AM 350)
- bonnet seal	FKM (VITON®) *
- gate seal	FKM (VITON®) *
Mounting position	any
Position indicator	
- Contact rating	3 A / 50 V DC
Compressed air pressure	4 - 7 bar / 55 - 95 psig (overpressure)
Compressed air connections	internal threads M5 *)
- without solenoid :	connections „open“ and „closed“
- with solenoid :	connection „P“ for air supply connection „R“ for exhaust
Action at power failure	
- valve closed	depends on type of solenoid
- valve open	depends on type of solenoid
Action at compressed air failure	
- valve closed	valve remains closed
- valve open	undefined
Closing time	< 1 s *)
Opening time	< 1 s *)

***) Standard specification. Specifications for optional features are provided on the dimensional drawing of the product.**

Installation

Leave the blue foil on the valve body openings as long as possible in order to protect the valve interior from dust and particles. The valve and seals must not be cleaned before installation. The valve is assembled at VAT in a clean environment and sealed in a plastic bag.

Attach the valve to a clean system only. The screws on the flanges have to be tightened uniformly in crosswise order.



Connect compressed air and electrical power only if

- valve is installed into the vacuum system
- moving parts cannot be touched

Do not touch electrical parts under voltage.

Admissible forces

The dimensions and tolerances specified on the dimensional drawing must be met under all operating conditions.

Compressed air connection

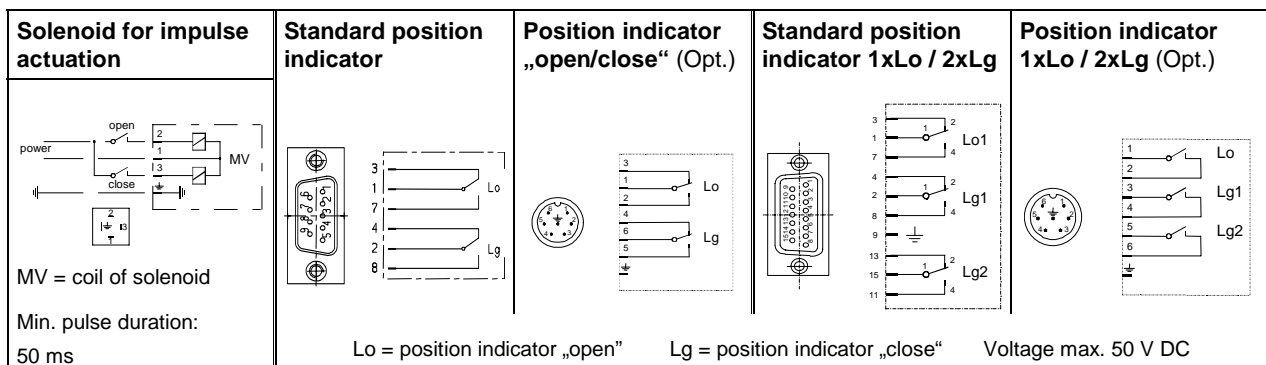
Compressed air pressure (min. - max. overpressure) 4 - 7 bar / 55 - 95 psi
Use only clean, dry or slightly oiled air.

Connections: Internal threads M 5
with solenoid : connection „P“ for air supply
connection „R“ for exhaust
without solenoid : connections „open“ and „closed“, quick connect fitting for 4 mm tube

Electrical connection

Sockets for position indicator and solenoid are supplied with the valve. Verify that control voltage matches voltage indicated on the solenoid.

Wiring diagrams :*)



*) Standard specification. Specifications for optional features are provided on the dimensional drawing of the product.

Operation



“Products without differential pressure tabs are specifically designed for operation under equal pressure on either side. Application of differential pressure through such products may cause damage to the product and serious injury of people!”
Please refer to the dimensional drawing of the product to ensure it is properly specified for the application.

Normal operation

Valve with pneumatic actuator : Valve is opened and closed pneumatically.

Admissible temperature

See chapter «Technical data».

Compressed air failure

Valve closed: Valve remains closed (mechanically locked).
Valve open: Valve position is undefined.

Power failure

Valve supplied with pneumatic connection (ordering code 021 . . . 24) :

Valve position depends on applied solenoid valve. VAT recommends to operate all transfer valves with impulse actuated solenoids.

Valve supplied with impulse solenoid (ordering code 021 . . . 44) :

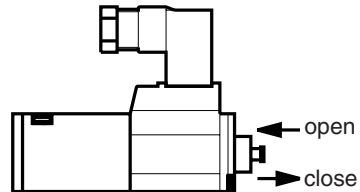
Valve closed: Valve remains closed (mechanically locked).
Valve open: Valve remains open.
A started movement will be completed.

Emergency operation at power failure

In case of power failure, valve can be actuated if compressed air is available.

To actuate valve in case of power failure :

- Press push-button : Valve opens
- Pull push-button : Valve closes



Preventive Maintenance

The italicized numbers refer to the detail drawings in this chapter and to the drawings in chapter «Spare parts».

Under clean operating conditions, the valve does not require any maintenance during the specified cycle life (see chapter «Technical data»).

Preventive maintenance actions include replacing gate, bellows, and piston seals. Also, the pneumatic parts are relubricated, and the valve body is cleaned. Other parts are checked and replaced if necessary. For repair or case of emergency, VAT recommends to keep at least the following spare parts on site :

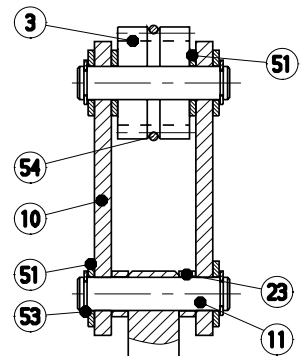
- 1 MONOVAT gate
- 2 bellows assembly
- 1 complete gate/actuator assembly (minimizes MTTR)

Cleaning or Replacing Gate

1. Vent chambers and open valve
2. Disconnect valve from compressed air and electrical supply
3. Unfasten bonnet screws 65 and remove gate/actuator assembly carefully
4. Loosen screws 44 by 1 turn to withdraw gate from shafts
5. Clean or replace gate, reassemble in reverse direction. Tighten gate screws 44 with 5 Nm.

Replacing Bellows

1. Remove gate as described above
2. Remove cover sheets 15 (2x) with screws 47 (4x per sheet)
3. Remove circlip 53, distance rings 23 (2x), and bolt 11 (see detail)
4. Unfasten screws 40 (8x) and remove bonnet 64
5. Pull out bellows assembly 2 carefully
Note : Do not contaminate O-rings 30 and tube 17 with any dirt or lubricant.
6. Mount new bellows assembly 2, O-rings 30 (2x per bellows) and tube 17 (1x per bellows)
Note : Handle new bellows assembly with gloves.
7. Reassemble in reverse direction



Please note :

- Do not contaminate the vacuum side of the bellows with any lubricant.
- The shaft of replacement bellows assembly is lubricated at the factory for the shaft bushing.
- Actuator has a leak detection port (marked on drawing) for the bellows assembly.

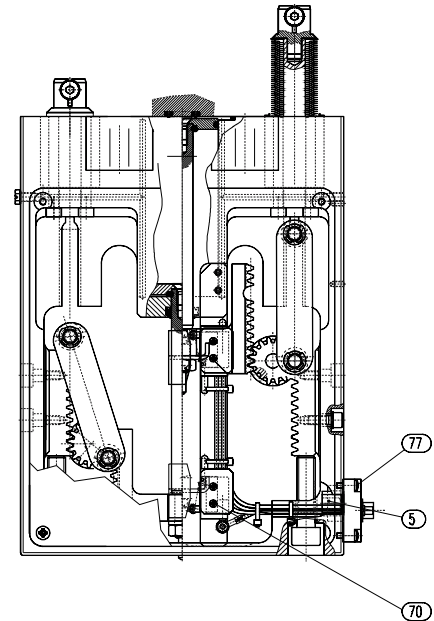
Replacing Piston seals:

1. Remove gate and cover sheets as described above
2. Unfasten screws 40 (8x) and remove bonnet 64
3. Remove nut 55 and lug 22, and pull out piston 14 and shaft 13
4. Replace piston O-ring 32 and shaft seal 33, replace static O-rings 31, 35, 36 if damaged
5. Lubricate cylinder and piston with VAT high temperature pneumatic grease
6. Reassemble in reverse direction

Replacing Position indicator

1. Disconnect valve from compressed air and electrical supply
2. Remove cover sheets 15 (2x) with screws 47 (4x per sheet)
3. Unfasten screws 77 (4x), wire wrap and screws 70 (2x per assembly)
4. Pull mounting bar downwards out of it's slot in the actuator house.
5. Pull out insert 5 (to the left) and remove position indicator.
6. Reassemble in reverse direction

The switch point can be readjusted by loosening the screws of the switch and moving the switch in the slotted holes of the mounting bar. The switch point should be set 1 to 1.5 mm prior to the end positions.

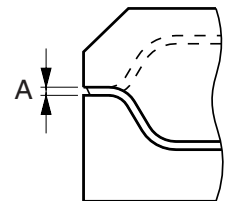


Adjustment of Actuator

The compression of the gate seal is adjusted and tested at our factory and must normally not be readjusted.

Verification of Adjustment

- Gap «A» between gate and seat (see sketch beside) should be $3.0 \text{ mm} \pm 0.15 \text{ mm}$
- Gate and seat should be parallel within 0.2 mm
- During closing the mechanical locking should occur between 1.0 and 1.2 bar air pressure
- To check this :
 1. Reduce air pressure below 0.5 bar
 2. Command valve in closed position
 3. Increase air pressure until a clicking sound indicates the mechanical locking



Adjustment of Compression and / or Parallelism

1. Open valve
2. Loosen screws 43 (2x per rack) of racks 12 (2x)
3. Adjust compression of gate seal by turning both screws 42 by the same angle
Note : Turning screws 42 by 30° results in 0.125 mm change of compression.
4. Adjust parallelism by turning one screw 42
Note : Turning one screw 42 by 30° results in 0.125 mm change of compression on the respective side
5. Fasten screws 43 (4x)
6. Open and close valve, verify again compression and parallelism, repeat adjustment if necessary

Lubrication of Valve

- Gaskets in the vacuum area are not lubricated. Small amounts of a suitable high vacuum grease (VAT high performance vacuum grease) may be used to lubricate O-rings or gate seal.
- Lubricate pneumatic cylinder and piston seals with VAT high temperature pneumatic grease. Other lubricants may not meet our cycle life specification.
- Lubricate gears, racks, and lashes in the actuator with Rocol or equivalent.
- Lubricate screws outside the vacuum with Molykote 321 R or equivalent. Screws supplied by VAT are lubricated.
- Pneumatic cylinder and actuator parts must be relubricated after the specified cycle life (see chapter «Technical data»). The shaft of new bellows assembly is lubricated at the factory.



Spare Parts

Seal kit, Actuator service kit, Lubricants

Description	Ordering no.
Seal kit, consisting of 1 gate with vulcanized VITON® seal and 1 bonnet seal	On request
Spare bellows assembly, 25 x .. / 32 x ..	94196-R1
Spare bellows assembly, 46 x .. / 51 x ..	76610-R1
VAT high temperature pneumatic grease (for piston), 12g	N-6951-403
VAT high performance vacuum grease, 10g	N-6951-011

Gate with vulcanized VITON® seal, Bonnet seal, Body O-ring at SEMI interface

DN	Gate aluminium, VITON® seal	Gate stainless steel, VITON® seal	Bonnet O-ring VITON®	O-ring VITON® at SEMI interface	Bonnet VATSEAL (optional, SS body only)
32 x 222	76168-R1	78175-R1	N-5100-266	N-5100-263	82180-01
46 x 236	77006-R1	78201-R1	N-5100-266	N-5100-263	82180-01
50 x 336	94027-R1	96031-R1	N-5100-275	N-5100-273	81697-01
25 x 160	91088-R1	81483-R1	N-5100-262		82588-01
25 x 210	-	81786-R1	N-5100-266		82180-01
25 x 265	-	77008-R1	N-5100-271		77951-01
25 x 420	85113-R1	80664-R1	N-5100-279		92075-01
51 x 160	78819-R1	78493-R1	N-5100-262		82588-01
51 x 210	77939-R1	78213-R1	N-5100-266		82180-01
51 x 265	79364-R1	78485-R1	N-5100-271		77951-01
51 x 420	76752-R1	77682-R1	N-5100-279		92075-01
25 x 254	-	77008-R1	N-5100-271		77951-01
32 x 336	92020-R1	-	N-5100-275	N-5100-273	81697-01

Gate/actuator assembly, Valve body, Bonnet flange

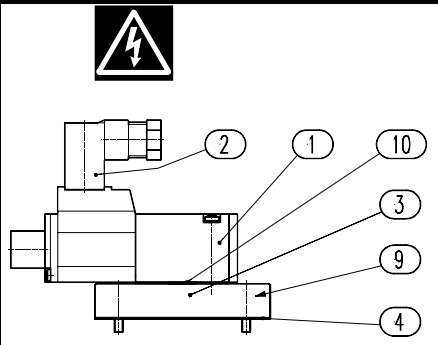
Ordering numbers of gate/actuator assembly, valve body (Pos. 60), bonnet flange (Pos. 64), and flange O-ring of custom made valve body (O-ring size indicated on dimensional drawing) are supplied on request. Please indicate fabrication number or ordering number and drawing number of the product in question to help identify the required part.

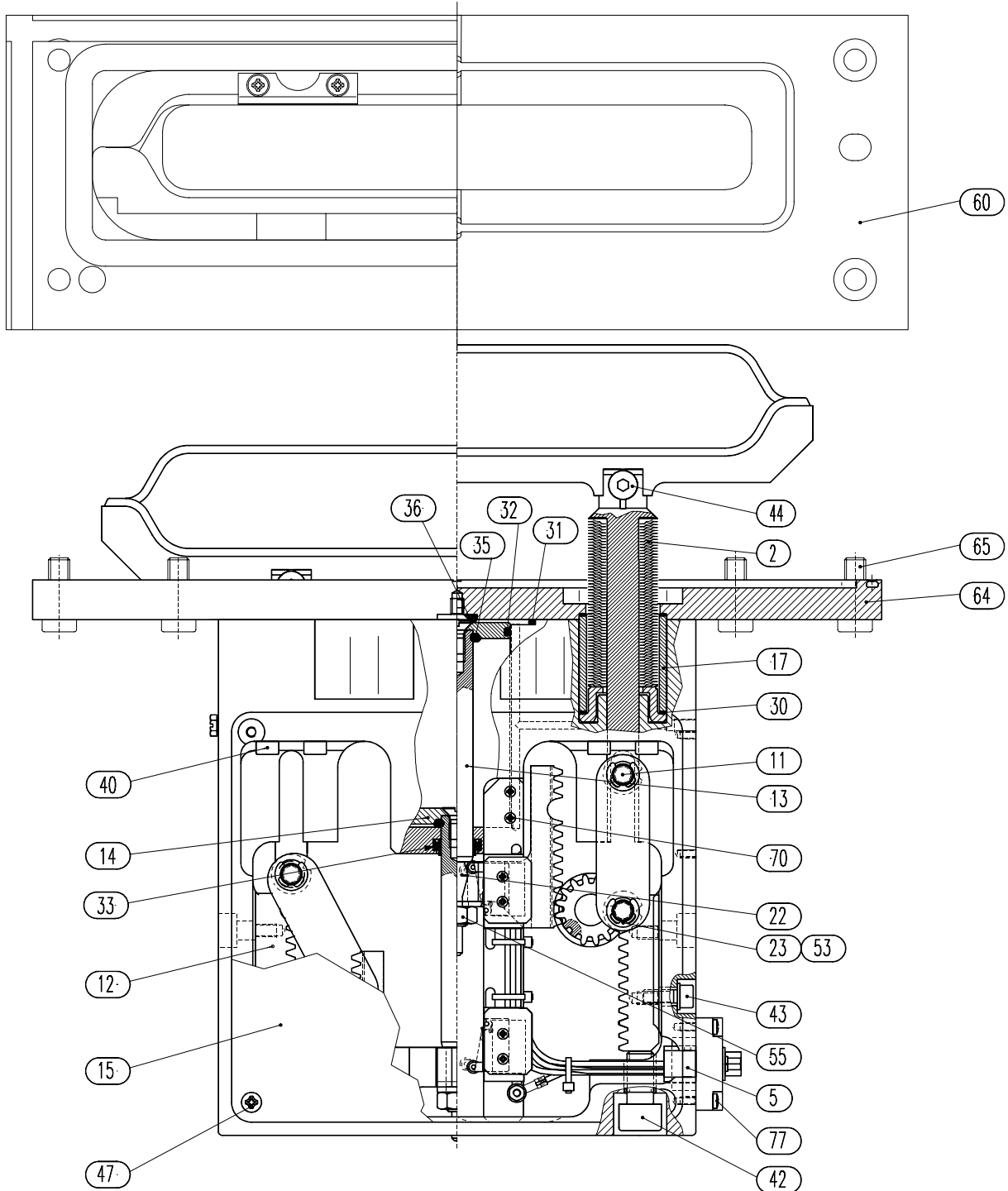
Gate with special vulcanized sealing material and/or special surface treatment, SEMI sizes

Gate material	Sealing material	32 x 222	46 x 236	50x336
Aluminium	Chemraz® 630	96072-R1	96073-R1	96074-R1
	Chemraz® 513	92032-R1	85104-R1	205413
	Chemraz® E38	100432-R1	100430-R1	100431
	Parofluor® V8514-65	93098-R1	91154-R1	204662
	Perfluoro black	81063-R1	78510-R1	-
	Silicone red	79416-R1	82625-R1	-
	Silicone transparent	-	85630-R1	-
	SC 1107	205580	205581	204585
Aluminium hard anodized	VITON®	80499-01	82510-01	95842-R1
	Chemraz® 630	-	99424-R1	101367-R1
	Chemraz® 513	93096-R1	88100-R1	-
	Parofluor® V8514-65	96045-R1	-	-
Aluminium nickel plated	VITON®	96062-R1	92796-R1	97154-R1
	Chemraz® 630	-	97147-R1	-
	Chemraz® 513	-	89375-R1	-
Stainless steel	Chemraz® 630	-	94106-R1	97077-R1
	Chemraz® 513	90151-R1	92057-R1	-

Not indicated sizes, materials, and surface treatments on request.

Solenoid

Item	Description	Qty	Ordering No.	
-	Solenoid kit (consisting of all parts according to drawing)	1	206572	
1	Solenoid - specify voltage!	1	N-7542-000	
2	Plug	1	N-8501-402	
3	Connection plate	1	206575	
4	Seal	1	206576	
9	Screw M3 x 12	4	N-6024-526	
10	Seal flat	1	N-7501-012	



Trouble Shooting

Valve does not close / open :	Power available? Compressed air available? Solenoid defective?	Check voltage. Check air pressure. Check solenoid (manual emergency operation).
Leak at gate :	Dirty? Gate seal damaged? Seal compression weak?	Clean valve seat and gate. Replace gate if damaged. Check air pressure and actuator adjustment.
Leak at body :	Flanges leak tight? Leak at bellows?	Clean or replace flange O-ring. Replace bellows.

Repairs

Contact VAT for repairs or maintenance. Please advise the serial No. (F021 /) marked on the actuator. It is individually decided whether the repair can be performed by the customer or has to be carried out by VAT.

Disconnect all supplies (e. g. compressed air, electrical power) for removal/installation of the valve from/into the system before doing any repair.



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



Keep fingers and objects away from the valve openings!

Products returned to VAT for repair have to be free of harmful substances such as e.g. toxic, caustic or micro-biological ones. For radioactive contaminated products fill in the VAT form «Contamination and Radiation Report» and 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.