1. GENERAL

1.1 Application

Gate valves series 64 are shut-off devices designed for use in high vacuum techniques. They are specifically intended for industrial applications where long operating life is important and where utmoste reliability is required.

1.2 Design

These gate valves are equipped with bodies made of stainless steel. Welded and soldered joints are made to ensure that the valve interior is free from trapped volumes thus guaranteeing small degassing rates.

Sealing of the actuator is ensured by a rotary feed-through keeping the leak rate to the minimum also during operation. The design of the valve mechanism ensures that the valve remains mechanically locked and leak tight in case of compressed air failure.

2. TECHNICAL DATA

2.1 General technical data

- Pressure range	
DN 63 - 200 (2 1/2" - 8")	1×10^{-8} to 2000 mbar
DN 250 - 320 (10" - 12")	1×10^{-8} to 1000 mbar
- Max. differential pressure on valve plate	
DN 63 - 200 (2 1/2" - 8")	2000 mbar
DN 250 - 320 (10" - 12")	1000 mbar
- Max. differential pressure during opening	
in closing direction	30 mbar
in opening direction	1000 mbar*
- Leak rate on valve seat and body	$\leq 1 \times 10^{-9}$ mbar ls^{-1}
- Bakeout temperature	valve: 150° C (302° F) actuator: 50° C (122° F)
- Mounting position	any
- Cycle life until first servicing	100'000 closures
- Cycle life	500'000 closures
- Materials	
Body	1.4301, AISI 304
Valve plate	1.4301, AISI 304
Mechanism	1.4301, AISI 304 Bronze 1.4310, AISI 301 1.4034, AISI 420
- Seals	Viton

* Note: With this differential pressure the life time will considerably reduced depending on the operating conditions.

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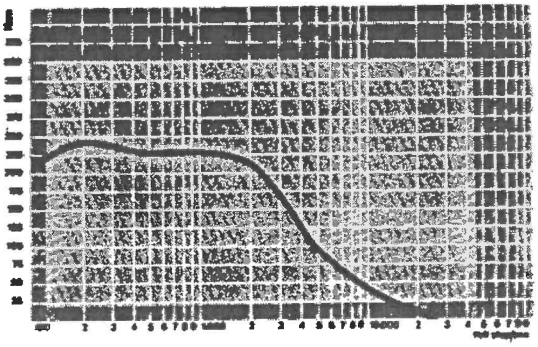
2.2 Data of actuator

Motor	Permanent magnet stepping motor MAE, 26010 Offanengo, Italy Type HY-200-3437-400-A8
- Holding torque	2.2 Nm (bipolar, 4A)
- Detent torque	0.15 Nm
- Current per phase max.	4.0 A (min 3A)
- Resistance per phase	0.75 Ohm (20° C)
- Inductance per phase	1.9 mH
- Steps per turn	200

HY 200 - 3437 - 400 A8



Driver bipolar chopper - 65 V - 5,6 Amps
Pull in rate = 985 Step/sec

Position indicator switches

One potential change-over switch per final valve position.

Breaking capacity	A.C. 250V/50Hz D.C. 50V/3A

Valve position potentiometer

Rotary potentiometer	10 kOhm
Rating capacity	1 W
Linearity	±1%
Tolerance on resistance	10%

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2.3 Technical Data depending of the nominal diameter

DN		Conductance in high vacuum	Manual operation						Electropneumatic operation							Electric motor operation			
			Lever			Spindle													
			Rotating angle of the lever for complete valve stroke	Weight		Spindle turns per stroke	Weight		Compressed air pressure		Cylinder capacity		Closing and opening time	Weight		Power consumption of electric motor	Closing and opening time	Weight	
mm	inch	ls^{-1}	°	kg	lbs		kg	lbs	bar[1]	psig	cm^3	in^3	s	kg	lbs	Watt	s	kg	lbs
63	2½	380	130	8	17.6	41	10	22	4-7	55-95	128	7.8	2.5	10.5	23	21	3	12.2	26.9
100	4	1300		13	28.6	41	15	33					2.5	15.5	34.2	21	3	17.2	37.9
150	6	3500		24	52.9	37	26	57.3			280	17.0	3.5	26.7	58.8	80	4	29	63.9
200	8	8000		30	66	37	32	70.5					3.5	32.7	72.1	80	4	35	77.2
250	10	13000		58	127.8	48	60	132			750	45.8	6	62.5	137.8	250	7	68	149.9
320	12	17000		108	238	48	110	242.5					6	112	246.8	250	7	118	260

1) Overpressure

3. UNPACKING

Remove plastic packing and protective cover of connection flanges only immediately before mounting the valve into your system.

4. GUARANTEE

VAT gate valves are assembled at our factory under extremely clean conditions. Each valve is carefully tested for conformity with specifications including a Helium leak test. Installation must also be made under clean conditions, and the mounting and operating instructions followed. Failure to observe the mounting and operating instructions, improper operation or modification of the valve will invalidate our warranty.

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5. MOUNTING MATERIAL

Depending on the flange type either ISO or UHV (CF) components are required for mounting the valve into the system, which can be supplied by VAT.

6. MOUNTING

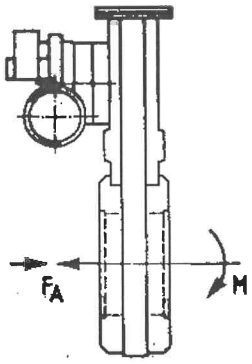
6.1 Cleanliness

When handling the valves the following precautions must be observed:

- mounting of the valve must take place under clean conditions normally observed in good vacuum practice
- touch the valve only with clean gloves
- install the valve only into clean systems

6.2 Stress relief

The valve must not be used to support other components of the installation. A bellows section is required to protect the valve from deformation where stress could result from baking or from the weight of other components of the tubing. The below table specifies the maximum allowable forces.



F_A = axial tensile or pressure force

M = bending moment

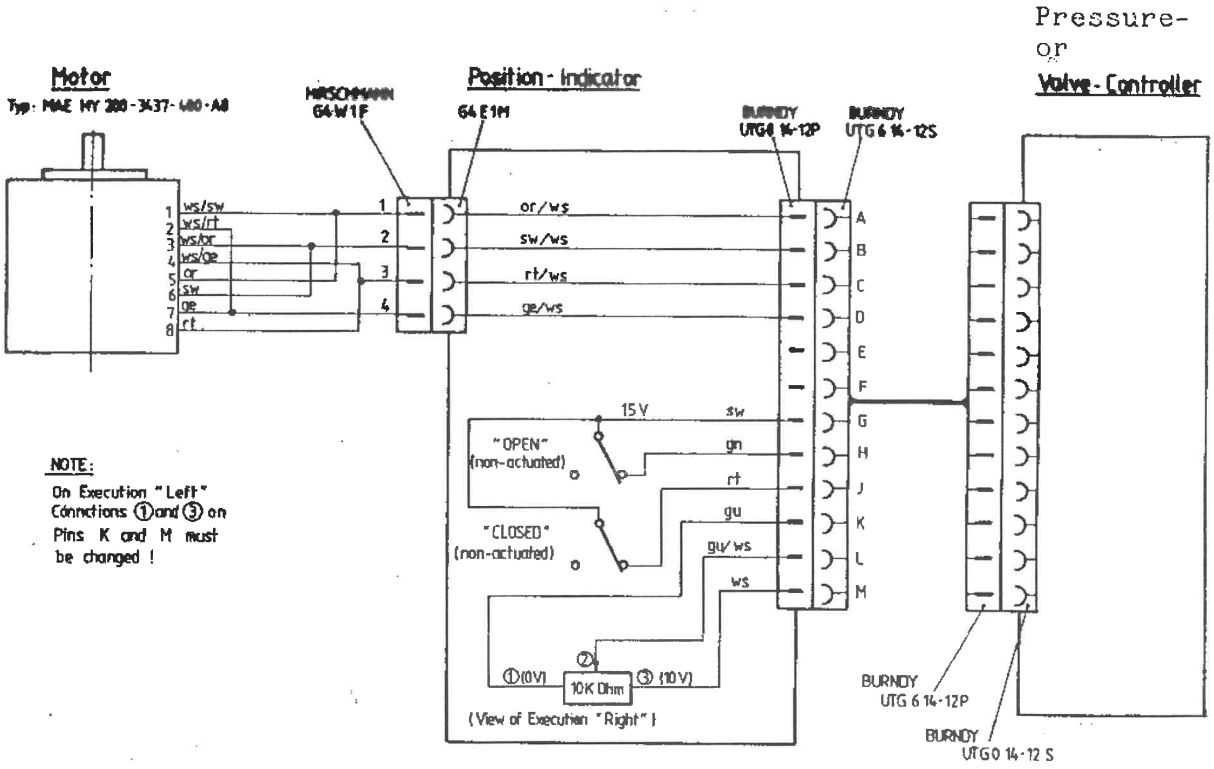
The 2 stresses toghether (F_A+M) are not permissible

Valve Diameter		F_A		M	
mm	inch	N	kp	Nm	kpm
63	2 1/2	1960	200	78	8
100	4	2450	250	98	10
150	6	2940	300	147	15
200	8	2940	300	147	15
250	10	3430	350	196	20
320	12	3920	400	294	30

In case of heavier loads than indicated on above table, or if a combination of axial forces and bending moments occur, please contact the manufacturer.

6.3 Electrical Connection

All connections required for driving the valve with a VAT VALVE CONTROLLER are continued on a 12 pin connector type Burndy.



Gate valve, series 64 with stepper motor

Connection cable
code no.640VC-C100 (3 meters)
code no.640VC-C200 (10 meters)

VALVE CONTROLLER or PRESSURE CONTROLLER
code no. 640VC-G*** or 640PC-G*** *) depends on options

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7. MAINTENANCE

These gate valves will operate without maintenance for the number of cycles stated in the specifications provided that they are under clean operating conditions.

8. REPAIR AND SERVICING

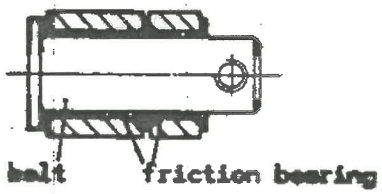
Simple repair and servicing (like replacement of the plate seal) may be carried out by the buyer if experienced personnel is available.

Please contact the manufacturer or their representatives for all other repair or service works. According to individual conditions, it will then be decided whether repair or servicing can be effected by the buyer's personnel or by VAT.
The fabrication number of the gate valve should always be specified. Our special repair and servicing instructions and/or manuals must be strictly followed.

8.1 Replacement of the plate seal

Proceed as follows:

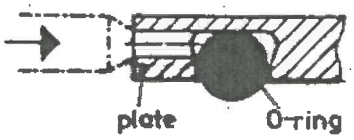
- Valve in closed position
- Remove body bonnet
- Valve in open position
- Remove hexagon socket screw from the pendulum lever
- Withdraw the bolt with the bearing from the bore, and by turning it, remove it through the slot of the plate



Caution:

Do not change by mistake the friction bearings (see drawing)

- Withdraw the complete valve mechanism from the body
- Replacement of the plate seal:
  On the side of the valve plate a bore is provided through which compressed air is to be admitted until the O-ring comes out of its groove.



- Cleaning:
  Before mounting the new O-ring, the plate, the valve mechanism and the valve body must be cleaned. For cleaning, use a lint free cloth soaked with alcohol or an equivalent cleaning material.

- Reassembly should follow in reverse order. It must be ensured that the plate O-ring is mounted on the side where the actuator is situated.

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