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Installation and Operating Instructions for

2", 2.5" & 3" VITON AND METAL SEALED GATE VALVES

INSTALLATION AND OPERATING INSTRUCTIONS FOR

2.5" AND 3" VITON SEALED GATE VALVES

GENERAL:

The 2.5" and 3" gate valve is available with either hand or pneumatic actuation. The actuators may be interchanged without removing the valve from the system.

MATERIALS:

Case and Flanges:	304 Stainless Steel, Vacuum Brazed
Bellows:	Formed Bellows Type 304 Stainless Steel
Main (Gate) Seal:	Viton A
Bonnet Seal:	Viton A or Copper

BAKE-OUT TEMPERATURE

Closed:	Up to 125 ° C
Open:	Up to 200 ° C

VACUUM RANGE:

Depends on a number of factors; previous degassing, time exposed to air, pumping speed, and pumping time.

Unbaked:	10-7 with 100 L/S Pump Speed
Baked:	10-9 with 100 L/S Pump Speed

PNEUMATIC ACTUATOR:

Air pressure: 50-90 psig
Max. Design Pressure is 125 psig.
Electrical: 115 VAC, 6.2 W, 60 Hz.,
The valve is wired for normally closed. Valve closes on electrical power failure.

POSITIONING:

The valve is designed to seal against air pressure in either direction.

AIR CONNECTION:

Connect air line to solenoid port marked "inlet." The exhaust port is equipped with a speed control. For maximum speed completely removed speed control from port. A quick opening and slow closing (or the reverse) is possible by adjusting one screw clockwise and the other counter clockwise. For slow operation in both directions turn both screws clockwise. Speed control is accomplished by restricting exhaust ports.

The valve is plumbed for normally closed operation. Valve will close on power failure.

To convert to normally open operation, interchange the two air tubes leading from the solenoid valve to the cylinder. The electrical connections are not changed.

ELECTRICAL CONNECTION:

Either wire may be connected to either 115 volt line.

OPERATION:

With air inlet connection to solenoid and electrical power off, the valve will close. An audible "click" sound will be heard when the valve closes and linkage goes past the overcenter position.

The valve will remain closed until electrical power is supplied to the solenoid which in turn directs the air pressure to the underside of the actuator piston forcing the valve open.

MANUAL ACTUATION:

The valve will be fully closed or fully opened in approximately seven revolutions of the knob.

To close:

Turn knob clockwise until linkage goes over center. A "click" can be heard and the operator will feel the closing mechanism build up resistance and then release as it goes over center.

CAUTION:

DO NOT apply extra torque to tighten the gate valve further. This overstresses the internal mechanism and will result in component failure,

If valve is not vacuum tight, further tightening of handle will not effect a seal. A minor adjustment to the internal linkage or cleaning of the sealing surface is necessary.

BAKE OUT:

The valve may be baked out at 200 ° C in the open position. Limit bakeout temperature to 125° C if the valve is in closed position to avoid sticking of the Viton gate seal.

When baking out a pneumatic actuated valve, keep the air cylinder away from heated zone as far as possible so that the conducted heat is minimized and the air cylinder remains below 100 ° C.

DISASSEMBLY

To remove the internal mechanism and actuator:

1. Open the valve.
2. Remove the six Allen head screws holding the bonnet plate to the valve body.
3. Position a table or other flat surface under the valve so the assembly can be lowered onto it easily. The wheels slip off the axles easily. Withdraw the complete assembly.
4. Detach the internal mechanism from the bonnet plate by removing the two pins (items 13 and 18).
5. The internal mechanism may be further disassembled in any sequence.
6. To disassemble the pneumatic actuator:
 - a. Disconnect the air lines from the solenoid valve.
 - b. Remove four screws holding cylinder (item 20) to end plate.
 - c. Remove piston from end of piston shaft, then slide end plate (item 22) from piston shaft.
 - d. Remove standpipe (item 29) from bonnet plate to leave bellows and piston shaft exposed.

To assemble pneumatic actuator, reverse the above steps.

7. To disassemble the manual actuator:
 - a. Remove knob.
 - b. Remove four 6-32 screws from screw plate (item 7).
 - c. Unscrew screw plate from acme shaft.
 - d. Remove stand pipe to expose bellows and acme shaft.

To assemble manual actuator, reverse the above steps.

ADJUSTMENT OF THE INTERNAL MECHANISM

All gate valves have three adjustments that are necessary for proper operations: 1) leveling of the gate; 2) over center locking; and 3) compression of the gate o-ring.

1. The first adjustment is to the gate. The internal mechanism less the bonnet plate (part no. 1) is placed on a level surface, so that it rests on the four wheels with the gate o-ring facing down. Turn the adjusting screw on the front wheel carriage (item 28), until the gate is parallel to the supporting surface.

Attach the bonnet plate to the internal mechanism with the two pins (No. 23 and 24). Insert the mechanism into the valve body. Align the bonnet plate and the body flange so that they are even on all sides. Insert the bolts next to the stand pipe assembly item 2, and one at each end of the bonnet plate. Be sure that all the bolts are tight before attempting to actuate the valve.

Actuate the valve. First counter clockwise to be sure that it will fully open. Next, close the valve slowly, checking for binding or misalignment. As the gate seals and the mechanism goes over center, and audible "click" will be heard. The valve is properly adjusted when the mechanism has a minimum amount of travel over center, and will stay locked when the air is removed from the pneumatic actuator or the ball crack handle is allowed to have back lash without having the valve unlock.

2. The overcenter locking adjustment is made at the bolt located on the upper lining No. 16. Turning the bolt clockwise will increase the amount of overcenter travel. Too much overcenter travel will decrease the amount of compression on the gate o-ring. The approximate dimension is 0.350" from the top of the bolt to the surface of the upper linkage.

3. The amount of compression on the gate o-ring is controlled by screwing the lower linkage bolt assembly No. 6 in or out on the eye bolt No. 7 as required. A starting point is to have center to dent dimension from point 21 to point 22 set at 2.380".

Increasing the compression on the o-ring will increase the strain on the internal mechanism and also increase the noise level of operation.

Any o-ring that has taken a set and or become embrittled, through age or high temperature bake out cycling, should be changed. Any attempt to make an origin seal in this condition by increasing the compression may result in an internal component failure of the valve.

4. It may be necessary to open the valve several times to proper adjust the linkage.

After installation or disassembly, the complete valve and flange connections should be checked with a mass spectrometer type helium leak detector.

INSTRUCTIONS FOR INSTALLING THE PNEUMATIC CONVERSION KIT

Preparing the valves:

1. Remove the actuator knob.
2. Remove plate by removing four socket head screws and unscrewing plate from the acme threaded shaft.
3. Remove four socket head screws securing the stand pipe to the bonnet plate, (the bonnet plate should not be removed), and lift stand pipe cover off valve.
4. Using the tool supplied, remove the acme threaded shaft from top of bellows. Hold top of bellows (4) with channel locks, or pliers to prevent twisting the bellows. DO NOT HOLD BELLOWS BY CONVOLUTIONS.

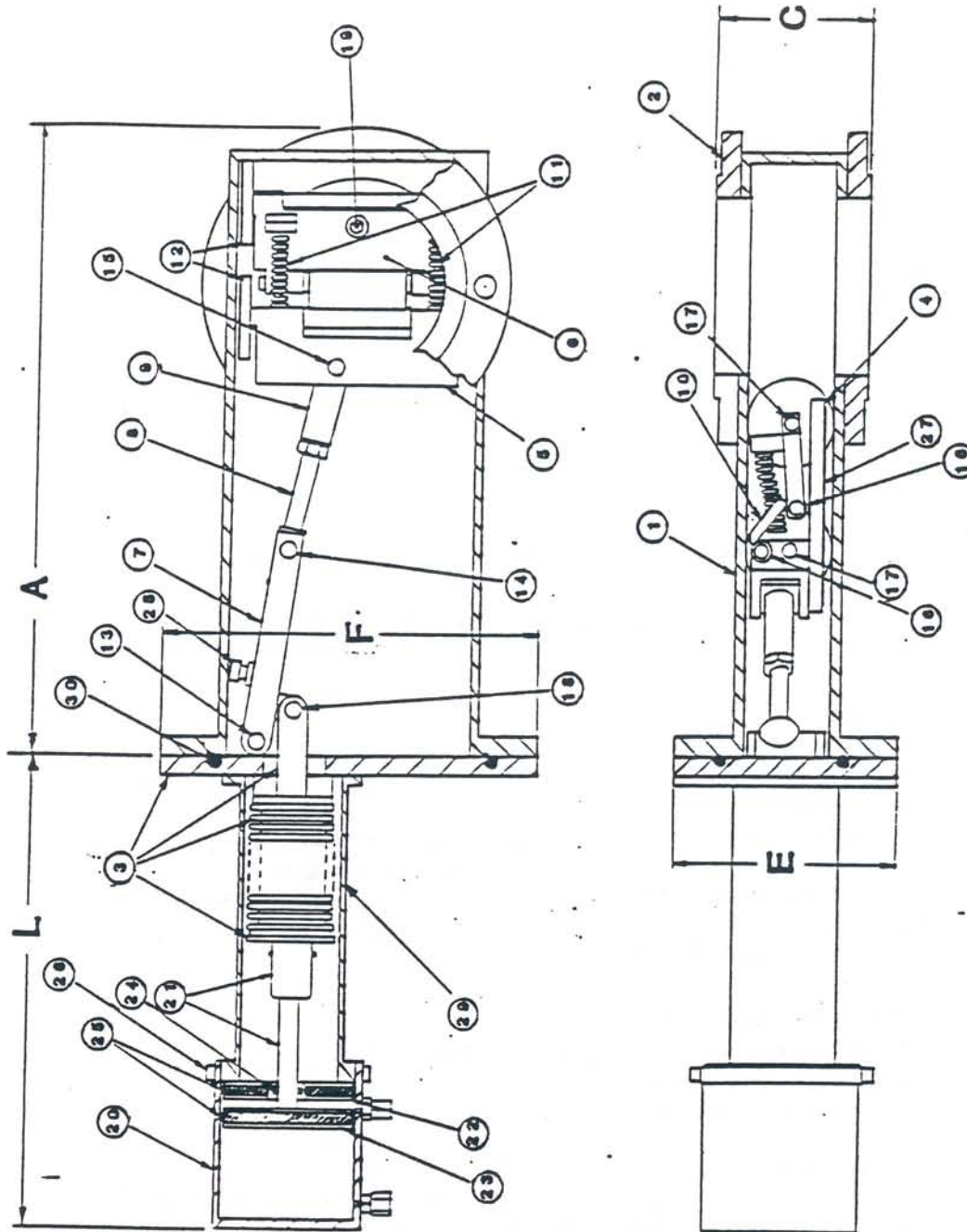
Disassembling Pneumatic actuator:

1. Remove aluminum cylinder from piston and piston shaft.
2. Remove piston from shaft.
3. Slide intermediate plate off piston shaft.

Assembling pneumatic actuator on valve:

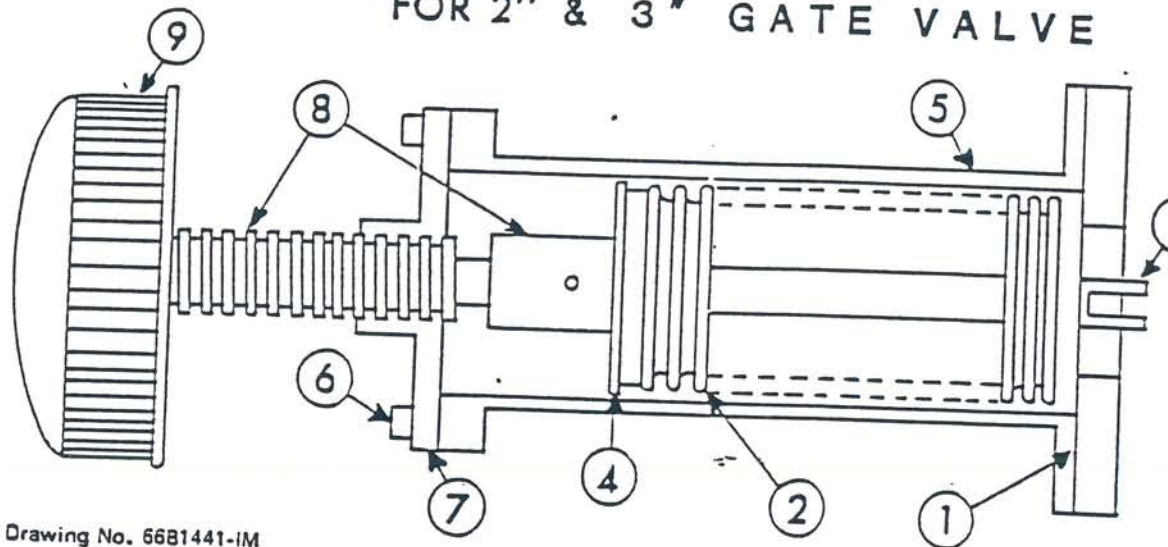
1. Attach solenoid valve to plate of stand pipe assembly with the two 10-32 flat head screws. The air inlet opening should be on the same side of the valve as the gate sealing surface.
2. with tool supplied screw the piston shaft assembly to the bellows assembly. Hold bellows assembly by top plate to prevent bellows from twisting.
3. Place stand pipe assembly/ solenoid assembly over bellows and secure to bonnet plate.
4. Slip intermediate plate over piston shaft.
5. Attach piston to end of piston shaft.
6. Place aluminum air cylinder over piston and intermediate plate and secure to top stand pipe ring with four 6-32 socket head screws supplied. Air line connection should be pointing to solenoid valve.
7. Side end of tubing into #1 air fitting on solenoid valve and tighten $\frac{1}{2}$ turn past finger tight. Cut to proper length attach other end to top air fitting on cylinder.

2" S-S GATE VALVE — PARTS ASS'Y



ITEM	DESCRIPTION
1	CASE
2	FLANGE, PORT
3	BONNET/BELLOWS ASSY.
4	GATE
5	STRONG BACK
6	FRONT WHEEL CARRIAGE
7	UPPER LINKAGE
8	LOWER LINKAGE
9	EYE BOLT
10	LINK
11	SPRING
12	WHEEL
13	PIVOT PIN
14	ELBOW PIVOT PIN
15	EYE BOLT PIN
16	UPPER/LOWER LINK PIN
17	AXLE
18	BELLOWS STEM PIN
19	GATE LEVELLING BOLT
20	AIR CYLINDER
21	PISTON ROD
22	END PLATE
23	PISTON
24	O/RING, BUNA SHAFT
25	O/RING, BUNA PISTON
26	SCREW, AIR CYL. MTG.
27	O/RING, VITON GATE
28	OVER CENTER ADJ. BOLT
29	STAND PIPE ASSY.
30	BONNET SEAL

OUTLINE DRAWING — HAND ACTUATOR ASSEMBLY FOR 2" & 3" GATE VALVE



Drawing No. 66B1441-IM

BILL OF MATERIALS			
1	Bonnet Plate	65A143	1
2	Bellows	A-01094-A08	1
3	Bellows Stem	66A1506	1
4	Bellows End Cap	66A1434	1
5	Stand Pipe Assy.	66A1435	1
6	6-32 x 1/4 SHCS		4
7	Screw Plate	66A1436	1
8	Screw Assy.	68A1634	1
9	Knob	N-100	1

REPLACEMENT PARTS FOR 2" & 3" GATE VALVES

G-2	Item No.	Description	G-3
RC-G2	1	Case with metal seal port flanges	RC-G3
RB-G2	3	Bonnet Bellows Assembly	RB-G3
HA-G2	12, 13, 14	Hand Actuator (Drawing 66B1441)	HA-G3
PA-G2	20, 21, 22, 23	Pneumatic Actuator	PA-G3
OR-G2	24, 25, 26, 27, 30	O-Ring Set, Manual	OR-G3
ORP-G2	24, 25, 26, 27, 30	O-Ring Set, Pneumatic	ORP-G3
PS-G2	13, 14, 15, 16, 18	Pin Set	PS-G3
WS-G2	12	Wheel Set	WS-G3
L-G2	10	Link	L-G3
G-G2	4	Gate	G-G3
SB-G2	5	Strong Back	SB-G3
FW-G2	6	Front Wheel Carriage	FW-G3
SP-G2	29	Stand Pipe	SP-G3
LL-G2	8	Lower Linkage	LL-G3
UL-G2	7	Upper Linkage	UL-G3
E-G2	9	Eye Bolt	E-G3
S-G2	11	Springs	S-G3
NB-G2		Nuts & Bolts Set	NB-G3
Sol-G2		Solenoid	Sol-G3
MSB-RBG2		Bonnet Bellows Assembly	MSB-RBG3