

Building a rotary valve assembly (1002562)

Parts

- Main parts

Description	Item
Frame, encoder mount	Drawing 1002562-001
Motor mount	Drawing 1002562-003
40-tooth Timing belt pulley	Drawing 1002562-004, Modified pulley (with #4-40 setscrew holes)
12-tooth Timing belt pulley	Drawing 1002562-005, Modified pulley (with #4-40 setscrew hole)
Shaft extender	Drawing 1002562-006, Modified A7X 3-0808B
Belt	Brecoflex 6T2.5/120
Motor	Maxon 273271
Shaft coupler, 1/4"	Stock Products S51FX7-250250
Rotary Valve	4,6,8 & 14 position Cheminert valves
Encoder	ED-17, 512 count magnetic

- Small parts

Qty	Size	Item
1	1/8" x 1/2"	Dowel Pin
2	M2-5	Socket head cap screws
1	M6-1.0x16	Nylon-tipped Socket head set screw
1	M6	Nylon insert locknut
2	#2-56 , 3/8"	Socket head cap screw
3	#4-40, 1/4"	Socket head set screws
1	#6-32, 1/8"	Socket head set screw
1	#6-32 X 1/4"	Socket head set screw
2	#8-32, 5/8"	Socket head cap screws
2	#8	Split-ring lock-washer, hi-collar
1	#10-32, 1/2"	Socket head cap screw
1	#10	Split-ring lock-washer, hi-collar
1	#10	Flat washer

Tools

- Open-end wrench for M6 locknut (what size?)
- Hex keys—sizes:

5/32 "
9/64 "
5/64 "
1/16 "
0.050 "
1.5 mm

2.5 mm

Assembly

- 1) Press the 1/8" x 1/2" dowel pin into the frame. Pin should protrude, pointing toward encoder mount.

CAUTION: Make sure protrusion does not mushroom—check fit with motor mount.



- 2) Mount the Rotary valve on the frame using the two (2) #8-32 x 5/8" socket-head cap screws (SHCS) and the two (2) #8 split-ring lock-washers. Align valve step flat for access.



- 3) Attach the motor to the motor mount with the two (2) M2-5 SHCS's.



- 4) Mount the motor pulley temporarily using a #4-40 x 1/4" socket head set screw.
- 5) Connect the 40-tooth timing belt pulley to the modified 1/4-inch shaft-extender.



- 6) Slip the pulley/shaft-extender assembly onto the valve stem (assembly from Step 2).



- 7) Slip the 1/4" shaft-coupler onto the shaft extender, and start a #2-56x 3/8" SHCS into the coupler.



- 8) Put the belt (6T2.5/120) onto the 40-tooth timing belt pulley.

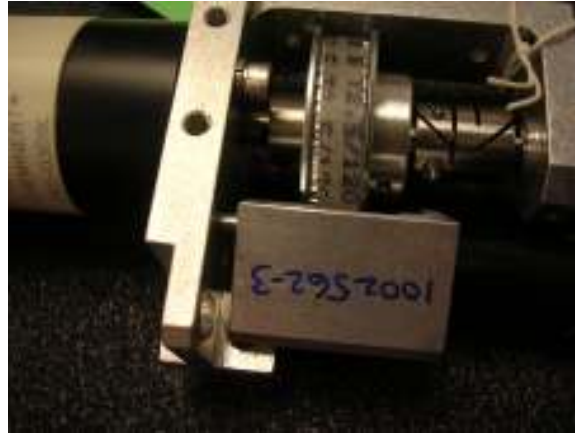


- 9) Thread the encoder into the frame until the last thread aligns the flat of the encoder with the frame set screw (6-32, 1/8") Install and tighten the set screw.

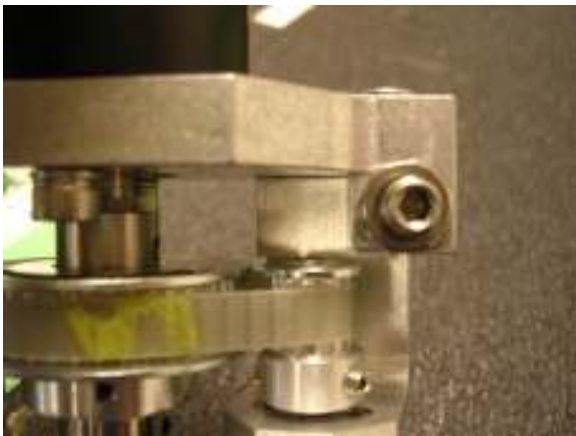


- 10) Shift the coupler so that the end of the encoder is just visible in the coupler slot, and tighten the coupler setscrew on the encoder side.
- 11) Shift the pulley/shaft extender assembly down until the shaft is just visible in the coupler slot. Tighten the coupler setscrew on the valve side.

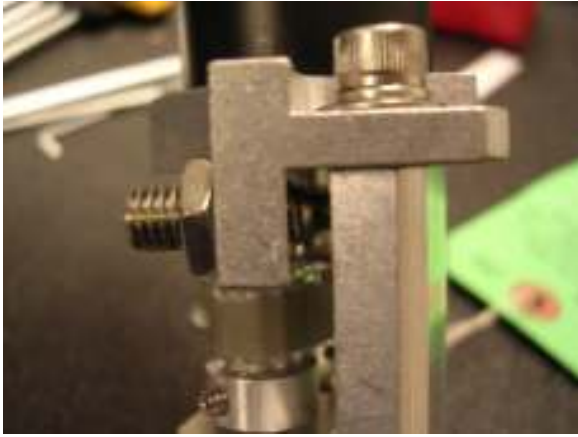
- 12) Tighten the shaft extender setscrew (#6-32, 1/4"). Ensure that the setscrew is aligned on the valve stem flat.
- 13) Calibrate valve here—See *Valve Calibration Procedure*, below
- 14) Guide the motor pulley into the belt and seat the motor mount onto the guide pin.



- 15) Align the pulleys. Shift pulleys or shafts to align the belt. The motor pulley should be as low as possible. Ensuring that the set screws align on the shaft, lock both pulleys with the set screws.



- 16) Lightly thread the lock screw (#10-32, 1/2" socket-head) with the two washers (#10 split and #10 flat) into the motor mount through the frame slot. Thread the M6 nylon-tipped setscrew into the frame hole and thread the M6 jam nut onto it. Tighten until the slack is removed from the belt. Lock with the jam nut. Secure the position with the lockscrew.



Valve Calibration Procedure

- 1) Remove motor mount/motor assembly.
- 2) Rotate to position one (use tube and blow air through to determine position).
- 3) Use laptop test setup and record encoder values for each valve position.