

North American 1177D-EP2 Control Valves for Air and Exhaust

Bulletin 1177D-EP2



The 1177D-EP2 Control Valve is an electro-pneumatically controlled butterfly valve capable of handling fluids up to 800 degF. For control input the valve uses a 4-20mA signal, and also features a feedback unit with 4-20mA output.

The 1177D-EP2 is capable of a full open-close-open cycle in less than 2 seconds for all sizes. This makes it ideal for applications which require a fast acting valve. The valve seats against machined seats in the body to prevent over-travel and provides a low leak rate. (See table 1).

INSTALLATION

All 1177D-XX-EP2 Valves must be installed with the shaft in a horizontal orientation. Maximum ambient temperature must not exceed 176 degF. See sheet "1177D Dimensions" for process and control connection information. See sheet "Supply Air Requirements 1177D-EP2/1008-EP2" for air quality information. Each valve is supplied with a 1/4" miniature .01 micron automatic pulse drain coalescing filter to be installed in the compressed air supply line. Required supply air pressure is 70-90 psig.

SPECIFICATIONS

- Valve Body Material: Heat Resistant Cast Iron
- Valve Disc Material: 316 SS
- Valve Shaft Material: 316 SS
- Disc Clamp Material: 316 SS
- Disc Clamp Hardware: 304 SS
- Compressed Air Supply Pressure: 70-90 psig
- Maximum Operating Pressure: 2 psig
- Wafer Style Design
 - -6 thru -14 ANSI class 150 flange
 - -16 RPM flange
- Maximum Fluid Temperature: 800 degF
- Maximum Ambient Temperature: 176 degF
- Minimum Ambient Temperature: -4 degF
- Actuator Cycle Rating (closed to open to closed): 1,000,000
- Max Travel Time (open-close-open): 2 seconds
- Position Indication: Visual Indication on positioner
- Input 4-20mA
- 4-20mA Position Transmitter
 - 10-30 VDC (24 VDC recommended)
 - LCD display with keypad
- HART protocol
- Nema 4X (IP65)

CAPACITY INFORMATION

Flow is rated in SCFH, 70% open with a 1"wc drop at 70 degF. and 14.7 PSIA. Leak rate is rated in SCFH with 1 PSI backpressure.

Table 1

Valve Designation	Size (inches)	Cv @ 70%	Flow @ 70%	Leak Rate
1177D-6-EP2	3	225	9,650	330
1177D-7-EP2	4	333	14,300	360
1177D-8-EP2	6	814	35,000	780
1177D-9-EP2	8	1,303	56,000	1350
1177D-10-EP2	10	2,059	88,500	2230
1177D-12-EP2	12	3,188	137,000	3200
1177D-14-EP2	14	4,538	195,000	3700
1177D-16-EP2	16	5,910	254,000	4200

Change in flow and pressure drop across the valve is negligible when changing from 70% open to wide open unless inlet pressure is increased substantially to maintain the 1" wc pressure drop, which is why the sizing table shows capacities at 70% open.

ORDERING INFORMATION

1177D - - EP2

- 3" -6
- 4" -7
- 6" -8
- 8" -9
- 10" -10
- 12" -12
- 14" -14
- 16" -16

SPARE PARTS

PART NUMBER	SPARE AND REPLACEMENT PARTS LIST FOR EP2 SERIES VALVES
R620-2013-EP2	Digital positioner, 4-20mA input/output, Namur mount, includes gauge block
R620-1998-F	1/4" liquid, aerosol, sub-micron coalescing filter, automatic pulse drain
R620-1998-FK	Filter element kit for Coalescing filter R620-1998-F
R620-1003	Actuator seal repair kit for R620-2562 for 2-8970-4
R620-1004	Actuator seal repair kit for R620-2561 for 2-8970-3
2-8970-3	Pneumatic spring return actuator for 1177D-5 through -9
2-8970-4	Pneumatic spring return actuator for 1177D-10 through -16
R400-6120	Grease cartridge

MOUNTING and COMMISSIONING INSTRUCTIONS

Mounting

The shaft on the bottom the positioner must operate within the specified area. Looking at figure 1 below, the arrow (1) on the positioner shaft (and the lever) must move through the area marked by the arrows (2).

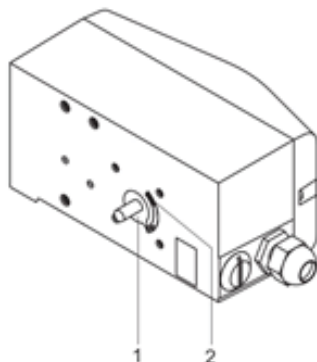


Figure 1

The positioner includes an adapter with spring, screws, washers, and shims, and mounting bracket shipped loose with replacement positioners. A gage block and pressure gages come pre-attached to the positioner. Figure 2 below shows the mounting hardware.

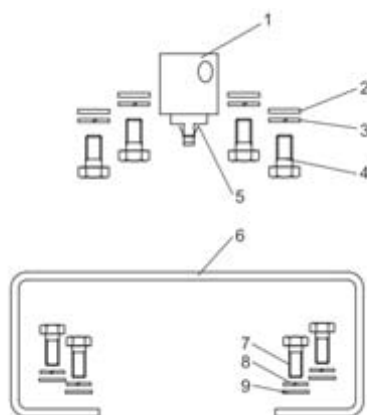


Figure 2

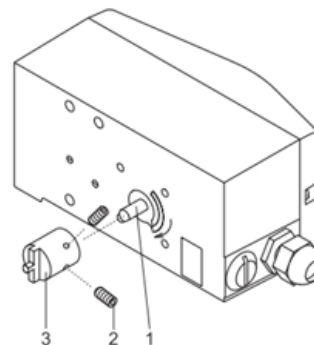
- Adapter (1) with spring (5)
- Four screws M6 (4), spring washers (3) and shim (2) to attach the mounting bracket (6) on the positioner
- Four screws M5 (7), spring washers (8) and shim (9) to attach the mounting bracket on the actuator

Required Tools:

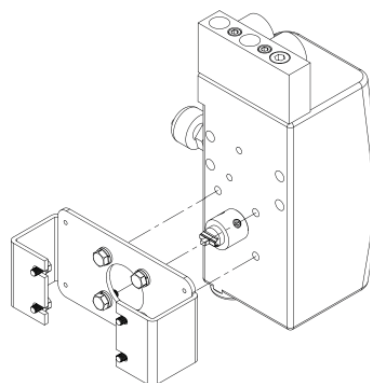
- Wrench 10mm and 13mm
- Allen Wrench 3mm

Step 1: Mounting the adapter on the positioner

- Determine the mounting position (parallel to actuator or at 90° angle, standard 1177D-EP2 mounting is at 90° angle).
- Calculate the rotational direction of the actuator (right or left, standard 1177D-EP2 rotation is left CCW).
- Move the rotary actuator into home position.
- Based on the mounting position as well as the home position and rotational direction of the actuator, determine in which position the feedback shaft (1) for the positioner must be preadjusted and in which position the adapter (2) must be placed to enable the positioner to travel with in the proper range (the arrow on the rear of the device must travel within the admissible range, see Fig. 1).
- Pre-adjust feedback shaft.
- Place the adapter in the proper position on the feedback shaft and fasten with set screws (3). One of the set screws must be locked in place on the flat side of the feedback shaft.

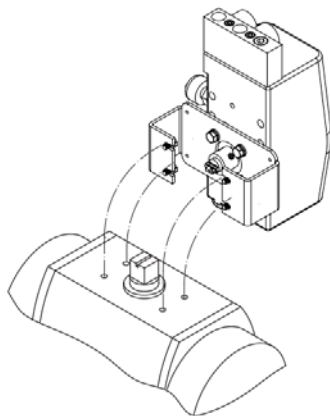


Step 2: Attach Mounting Bracket on the Positioner

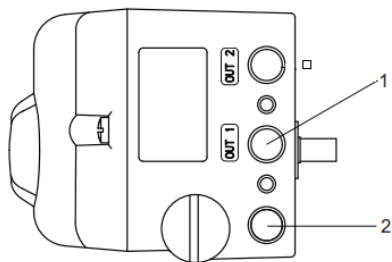


Mounting Bracket/Positioner orientation shown is the standard orientation for the 1177D-EP2

Step 3: Attach Positioner to Actuator

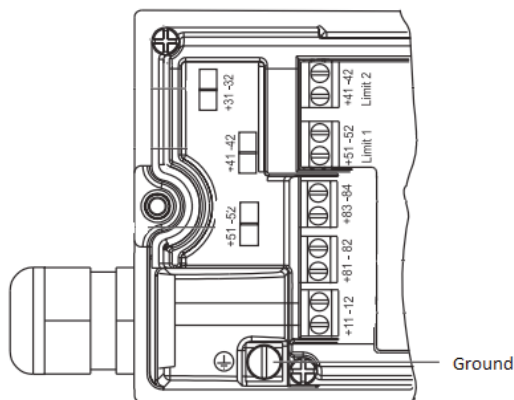


Step 4: Air Connections



1. Connect Out 1 Port on Gauge Block to Actuator Inlet
2. Connect Air Source to In Port on Gauge Block (Recommended Air Pressure 70-90 PSI, 90 PSI max. Coalescing filter must be used on supply air)
3. Gauges are pre-mounted on Gauge Block

Step 5: Electrical Connections



- Terminals +11 and -12 used for 4-20mA Analog Input
- Terminals +31 and -32 used for 4-20mA Feedback Loop 24VDC Powered Analog Output

Commissioning:

Option 1: Using the Pushbuttons and LCD Display on the Positioner

1. Feed in Air Pressure
2. Feed in electrical supply power
 - Feed in setpoint current 4 ... 20 mA (terminals +11/-12)
3. Check mount:
 - Press and hold **Mode**, plus ↑ or ↓ until operating mode 1.3 (manual adjustment within the sensor range) is displayed. Release **Mode**.
 - Press ↑ or ↓ to move the actuator/valve into the mechanical end position; check the end positions; rotation angle is displayed in degrees; for high-speed mode or if the actuator/valve does not move, press ↑ and then ↓ simultaneously to move in one direction and then ↓ and then ↑ simultaneously to move in the other direction.

Recommended range:

- Between -57 ... 57° for rotary actuators

4. Run Autoadjust
 - Press **Enter** and hold down until **ADJ_ROT** is displayed; release the **Enter** button
 - Press **Enter** again and hold down until the countdown ends
 - Release **Enter**; this starts Autoadjust

The Autoadjust process may take up to 5 minutes to finish, so please be patient. When Autoadjust is complete, the parameters will be stored automatically and the positioner will revert to operating mode 1.1 (Control Fix mode).

If an error occurs during Autoadjust, the process will be terminated with an error message. If this happens, press and hold down ↑ or ↓ for approximately three seconds. The unit will switch to the operating mode 1.3 (manual adjustment within the sensor range). The mount is checked and corrected if necessary. Autoadjust then runs again.

Option 2: Using a HART Communicator

1. Feed in Air Pressure
2. Feed in electrical supply power
 - Feed in setpoint current 4 ... 20 mA (terminals +11 / -12)
3. Connect HART communicator to terminals 11 and 12 coming from the positioner
4. Go online with the communicator.

Then go to Settings→ Valve Parameters→ Auto Configuration→ Start Auto Configuration

Performing a hard reset

In the event a hard reset needs to be made to the positioner, the following must be performed using the pushbuttons:

1. Press and hold down ↑ and ↓ keys and at the same time press and release **Enter button**, continue to hold ↑ and ↓ keys until countdown ends. This will take you into the configuration level.
2. Next, we will need to get into configuration level P11.0. Press and hold down the **Enter and Mode** buttons. Press the ↑ button until you get to P11.0 Release all buttons.

3. Press **Enter** and hold down until the countdown ends to activate the save position. Release the **Enter** button.
4. Press and hold down the **Mode** button. Now press the ↑ button until you get to P11.1 FACT_SET, FS_Load Release all buttons.
5. Press **Enter** and hold down until the countdown ends.
6. Press and hold down the **Mode** button. Now press the ↑ button until you get to P11.3 EXIT, NV_Save Release all buttons.
7. Press **Enter** and hold down until the countdown ends.
8. The positioner is now reset to the way it would have come from the factory.

*If the pushbuttons are not working, power to the positioner should be cycled.