Honeywell SP970A, B, C and D Manual and Minimum Position Pressure Regulators Installation Guide

Contents

Honeywell

Honeywell SP970A, B, C and D Manual and Minimum Position Pressure Regulators

DESCRIPTION

The SP970A, B, C and D Manual and Minimum Position Pressure Regulators provide regulated pressure to a controlled device DESCRIPTION such as a pneumatic damper operator. It provides either manually set pressure or manually set minimum pressure with variable maximum pressure. Figs. 1 and 2 show approximate dimensions.

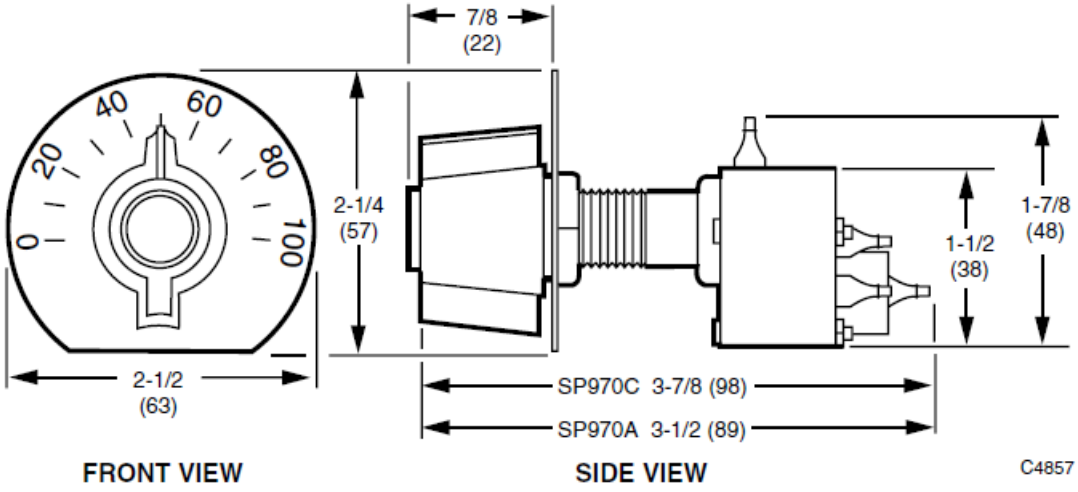

Fig. 1. SP970A and C dimensions in in. (mm).

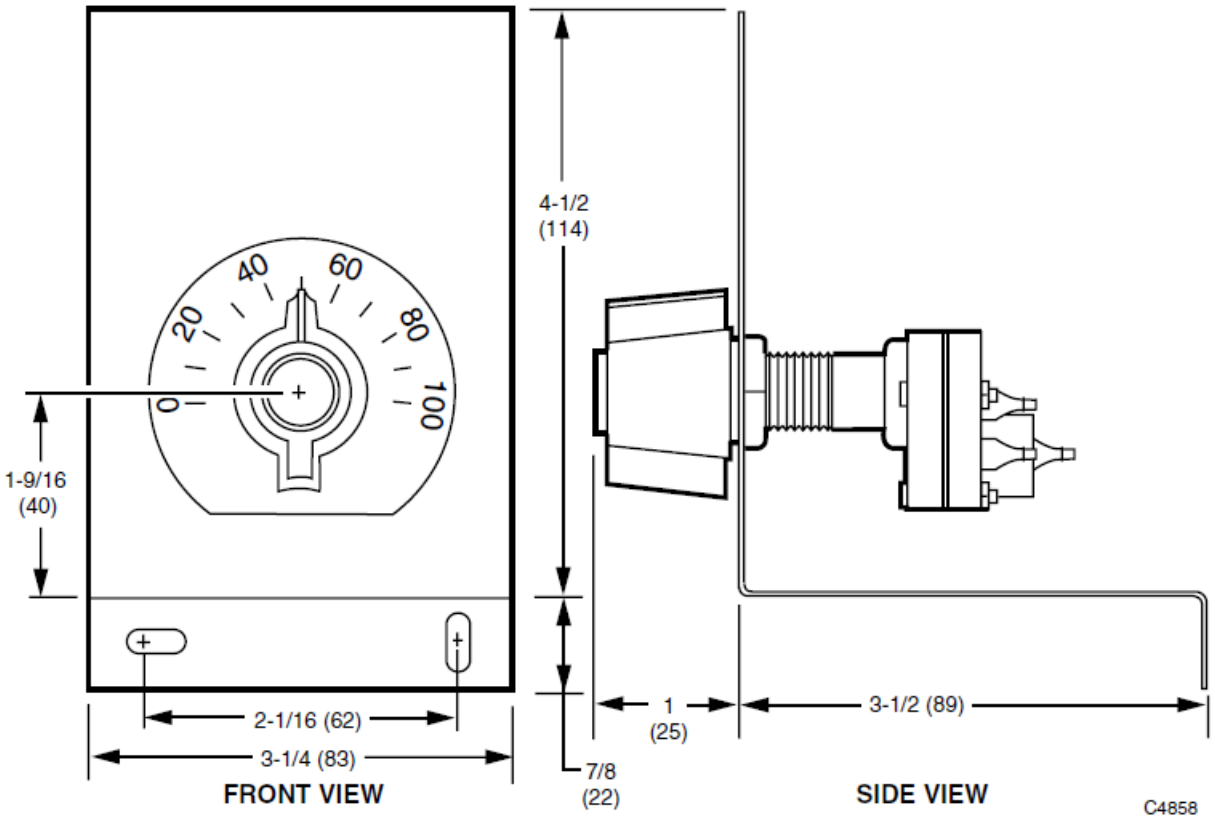

Fig. 2. SP970B and D dimensions in in. (mm).

BEFORE INSTALLATION

SP970A and C only

For panels having a thickness greater than 5/16 in. (8 mm) but less than one in. (25 mm), use 315677A Bus Assembly.

INSTALLATION

Mounting

The SP970A and C can be panel, surface or wall mounted. The SP970B and D are surface or wall mounted. See Fig. 3 and 4.

Panel Mounting SP970A and SP970C

1. Drill a 5/8 in. (16 mm) hole.
2. Lock the SP970 switch and scaleplate to the panel with a hex nut on the back of the panel. Use a second hex nut on the front panel. See Fig. 3.

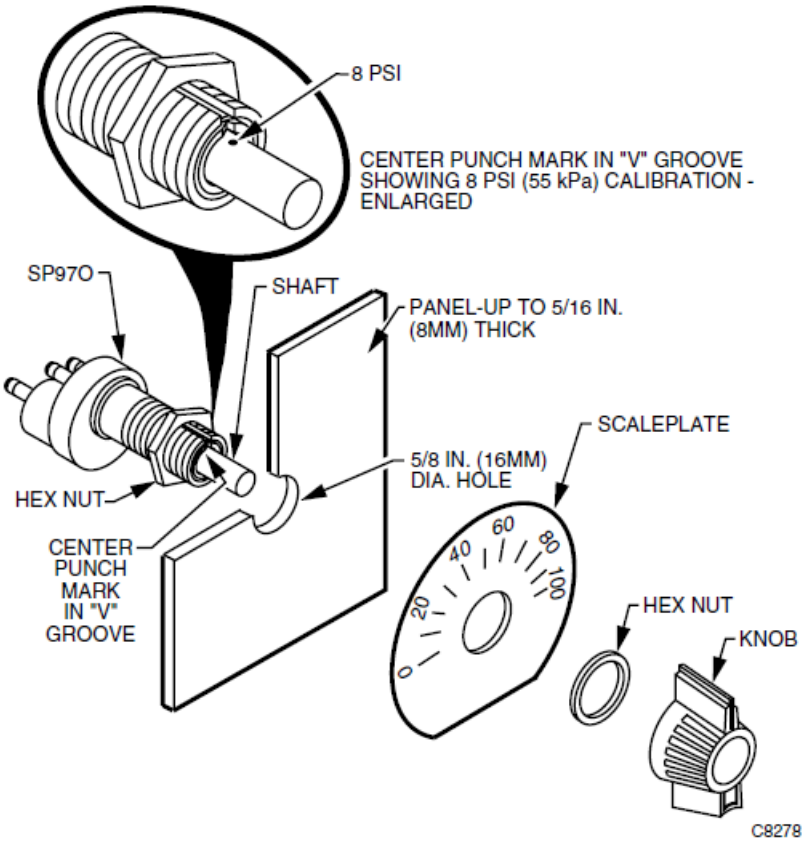

Fig. 3. SP970A and C panel mounting.

NOTES

- The scaleplate, knob and two mounting nuts are furnished with SP970A and C.
- Do not mount the knob during installation. Refer to the Calibration section of this document.

Surface Mounting
Use the mounting bracket as a template and secure mounting bracket to surface. See Fig. 4. Screws are not provided.

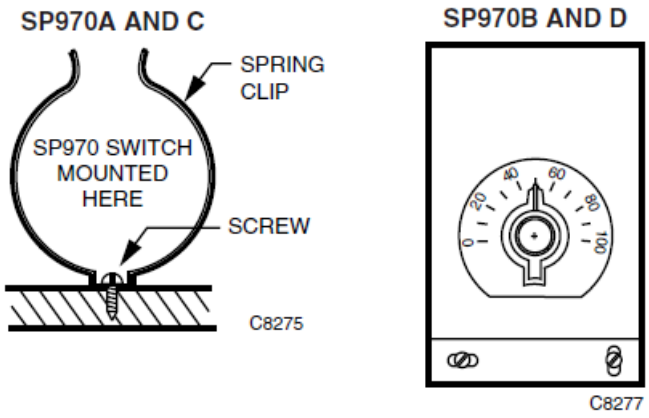

Fig. 4. SP970 surface or wall mounting.

Piping
All connections are sharp barb 5/32 in. (4 mm) O.D. polyethylene tubing.

CAUTION
Equipment Damage Hazard. To prevent damage to the sharp barb connections, do not attempt to cut or pull tubing. To remove the tubing from the barb connections, cut tubing a few inches from the control device. Use a coupling to reconnect tubing.

NOTES: When the system is not copper or polyethylene tubing, adapt as shown in Fig.5. Some models provide parts for adapting.

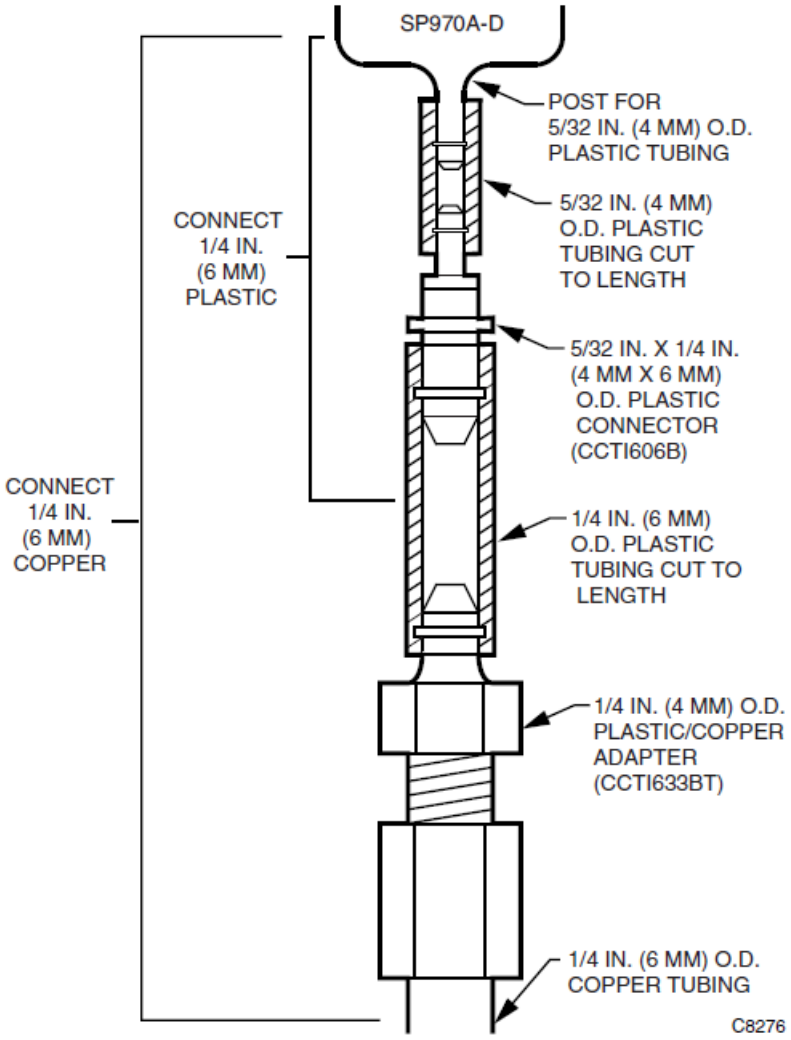

Fig. 5. Adaptation piping.

Port Identification Table
The two right columns in Table 1 identifies the ports of older Honeywell pneumatic relays when upgrading installation.

	SP970A Pressure Regulator	SP970A Minimum Position	SP970B	SP970C, D	SP92	SP93
Main	1	1	1	1	2	M
Pilot	—	4	—	3	4	P
Branch	2	2	2	2	3	B
Exhaust	4	—	4	4	—	—

Calibration

All SP970A and C models are calibrated at 8 psi (55 kPa) when the calibration mark (center punch) on the shaft is

centered at the bottom of the molded V. To calibrate, align the center punch mark on the shaft with the bottom of the molded V groove on the plastic surrounding shaft. See Fig. 3. This setting equals 8 psi (55 kPa). Secure the knob to the shaft at the proper scale setting. The knob should be pointing to 8 psi (55 kPa). See Fig. 4. All SP970B and D models are calibrated at 8 psi (55 kPa) when the knob is set at 50 percent. The large range device can be field recalibrated to other end points with the same span from 0 psi (0 kPa) lower limit to 26 psi (179 kPa) upper limit. The small range device can be field recalibrated to other end points with the same span from 0 psi (0 kPa) lower limit to 16 psi (110 kPa) upper limit.

Checkout and Test for All Models

1. With main air connected, insert a pressure gage into the branch line.
2. Check pressures equivalent to knob settings.
3. When minimum position is used, attach input and increase pilot pressure.
4. Verify correct operation.

ENGINEERING DATA

Specifications

Models

- **SP970A: A** bleed type pressure regulator.
- **SP970B: A** bleed type pressure regulator mounted on a sheet metal panel.
- **SP970C: A** bleed type pressure regulator with a dead ended pilot chamber for minimum pressure applications.
- **SP970D: A** bleed type pressure regulator with a dead ended pilot chamber for minimum pressure applications mounted on a sheet metal panel.

Selectable Spans for psi (kPa): See Table 2.

Model	Knob Rotation[a]		
	188	244	300
Small span	5 (34)	6.5 (45)	8 (55)
Large span	10 (69)	13 (90)	16 (110)

The setpoint knob normally rotates 188 degrees. Two breakaway stops on the knob allow rotation of 244 and 300 degrees.

Operating Pressure (Switch and Pilot) Range

- **Normal Main:** 18 psi (124 kPa)
- **Branch:** 3 to 15 psi (21 to 103 kPa)
- **Pilot:** 3 to 15 psi (21 to 103 kPa)

Maximum Safe Air Pressure: 30 psi (207 kPa)

- Ambient Operating Limits:
- Temperature: 0 to 140°F (-18 to 60°C)
- Relative Humidity : 5 to 95%

Air Handling Capacity

- SP970A, B: above minimum position, device feeding
- pilot determines capacity. Below minimum position, air capacity is 0.022 scfm (10 ml/s)
- SP970C, D: 0.022 scfm (10 ml/s)
- Air Consumption: 0.022 scfm (10 ml/s)
- Scaleplate: All models ship with a 0 to 100 scaleplate (including knob and locknuts).
- Construction: Molded plastic with neoprene diaphragm, steel spring and shaft.

Operation

SP970A and B: Three Port Switches

PRESSURE REGULATOR OPERATION Main line air flows through the restriction into the branchline chamber and out the nozzle. Branchline pressure increases until it is strong enough to compress the spring and lift the diaphragm off the nozzle. Airflow out the nozzle is controlled by the balance between the branchline pressure and spring force.

MINIMUM POSITION OPERATION
An external signal is connected to port 4 (exhaust port). When the external signal is greater than the spring load, the nozzle opens and branchline pressure is the same as the external signal. When the external signal is less than the spring load, branchline pressure is controlled as described in the previous paragraph. See Fig. 6.

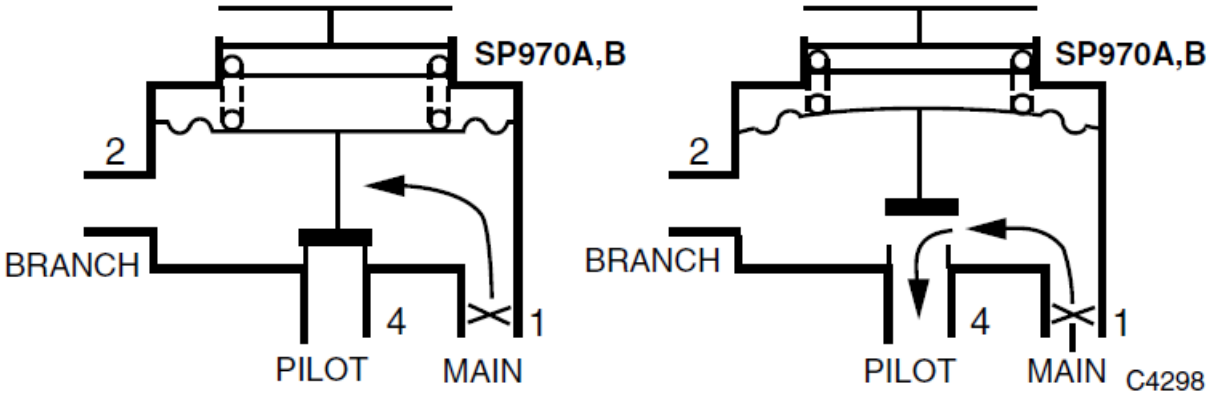

Fig. 6. SP970A/B operation.

SP970C and D: Four Port Switches
These minimum position devices have a separate dead ended chamber connected to port 3 to receive an external signal. When the external signal is less than the spring load, the signal has no effect and functions similar to the SP970A, B as a pressure regulator. When the external signal is greater than the spring load, the spring load is isolated and the device duplicates the inputsignal. See Fig. 7.

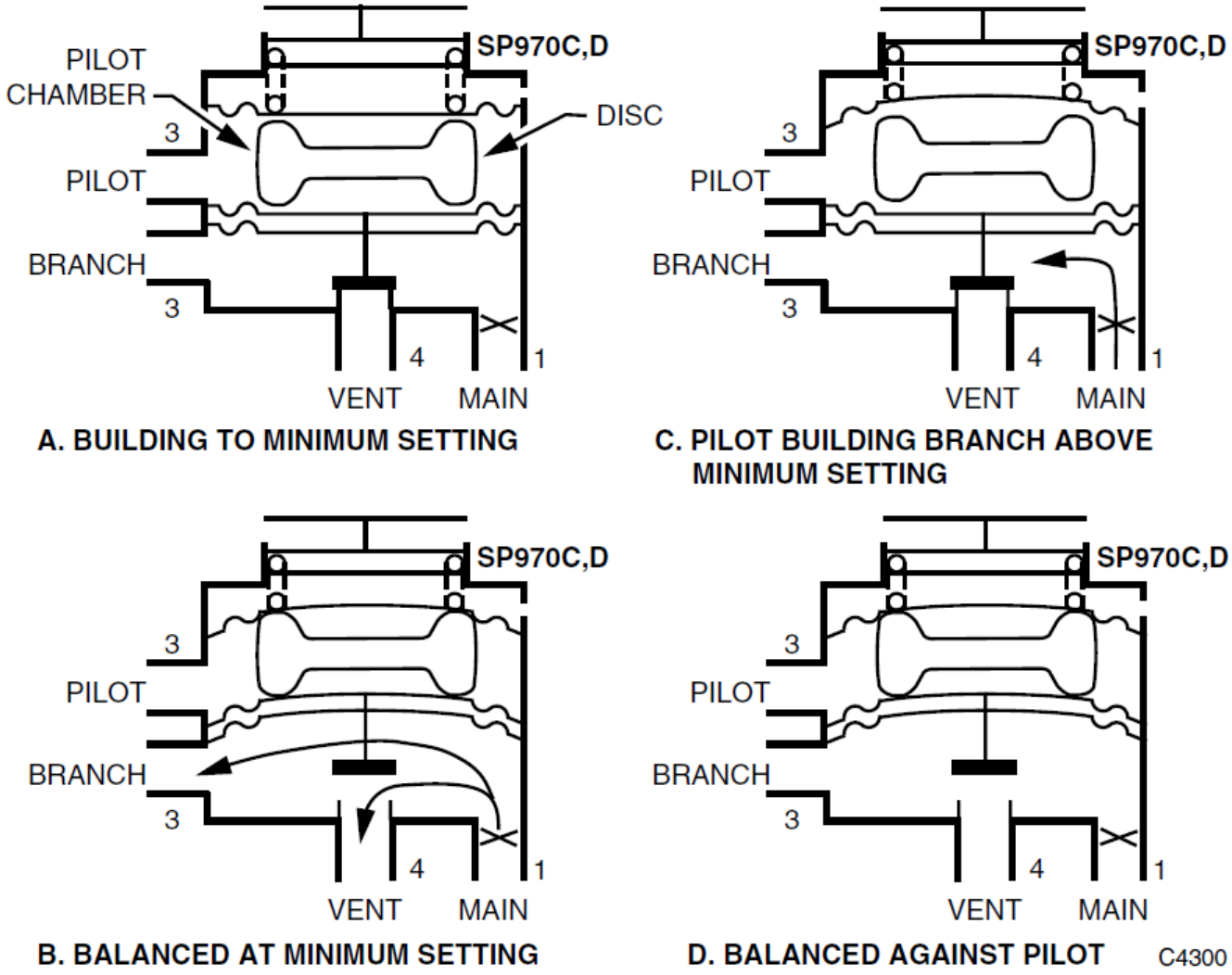

Fig. 7. SP970C and D operation.

Application

Fig. 8A shows a typical manual position application using the three port SP970A, B. This control system manually positions a damper between OPEN and CLOSED. Turning the setpoint knob clockwise increases the branchline pressure to the damper actuator and opens the damper. Turning the position knob counterclockwise decreases the branchline pressure and closes the damper. The three port SP970A, B is also used with a controller for automatic damper positioning with minimum position. See Fig. 8B. When the external signal is less than the knob setting, the spring maintains the branchline pressure as previously described. When the external signal rises above the knob setting, air from the signal flows directly to the branch. During steady state conditions, the external automatic controller must be capable of exhausting the air flowing through the exhaust (pilot) port 4. Fig. 8C shows a typical four port SP970C, D application. The minimum position switch keeps the pneumatic actuator at a minimum position until the thermostat pressure is greater than the minimum position valve. The thermostat then controls the actuator.

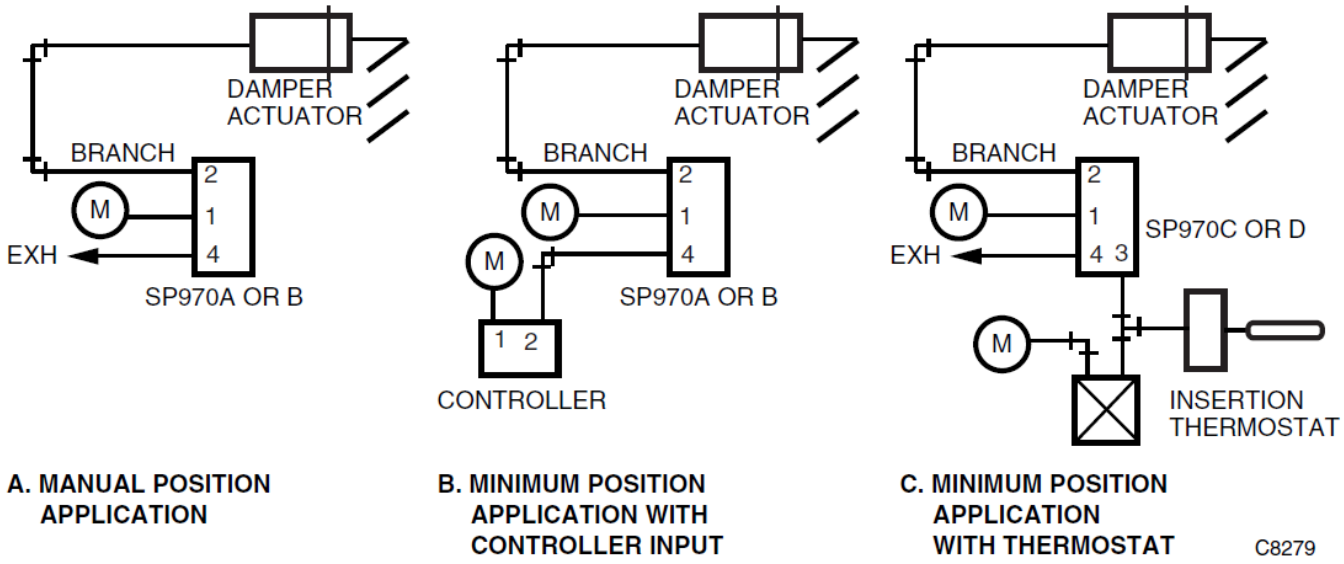

Fig. 8. Typical SP970 application.

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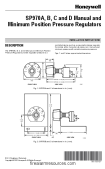	Honeywell SP970A, B, C and D Manual and Minimum Position Pressure Regulators [pdf] Installation Guide SP970A B C and D Manual and Minimum Position Pressure Regulators, SP970A, B C and D Manual and Minimum Position Pressure Regulators, Minimum Position Pressure Regulators, Pressure Regulators

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