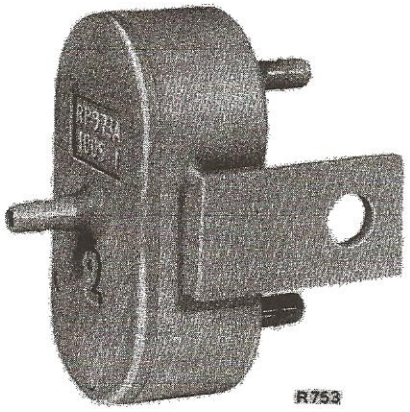
Honeywell

Pneumatic Averaging Relay

MODEL NUMBER RP973A

General

The RP973A is a direct acting, three-port pneumatic relay suitable for use in control systems where the average of two input pressures is required to operate a valve or damper motor, or as a controller input.



Features

- In-line mounting, but can be surface or panel mounted through mounting tab.
- Air connections (sharp barb) for 5/32 in. (4 mm) O.D. plastic tubing.
- Constructed of sonic welded plastic.
- High reliability, no moving parts.
- High efficiency filters on inputs.

Specifications

FILTERED RESTRICTION SIZE

.005 in. (.13 mm)

AIR CONSUMPTION

.007 SCFM max. (198 SCCM)

OPERATING AIR PRESSURE

3 to 15 psi (20 to 105 kPa) input and output. (Output accurate to ±15% of the difference of the two inputs.)

MAXIMUM SAFE AIR PRESSURE

30 psi (205 kPa)

AMBIENT OPERATING LIMITS

Temperature: 32 to 125F (0 to 52C)
Humidity: 5 to 95%

DIMENSIONS

Refer to Fig. 1

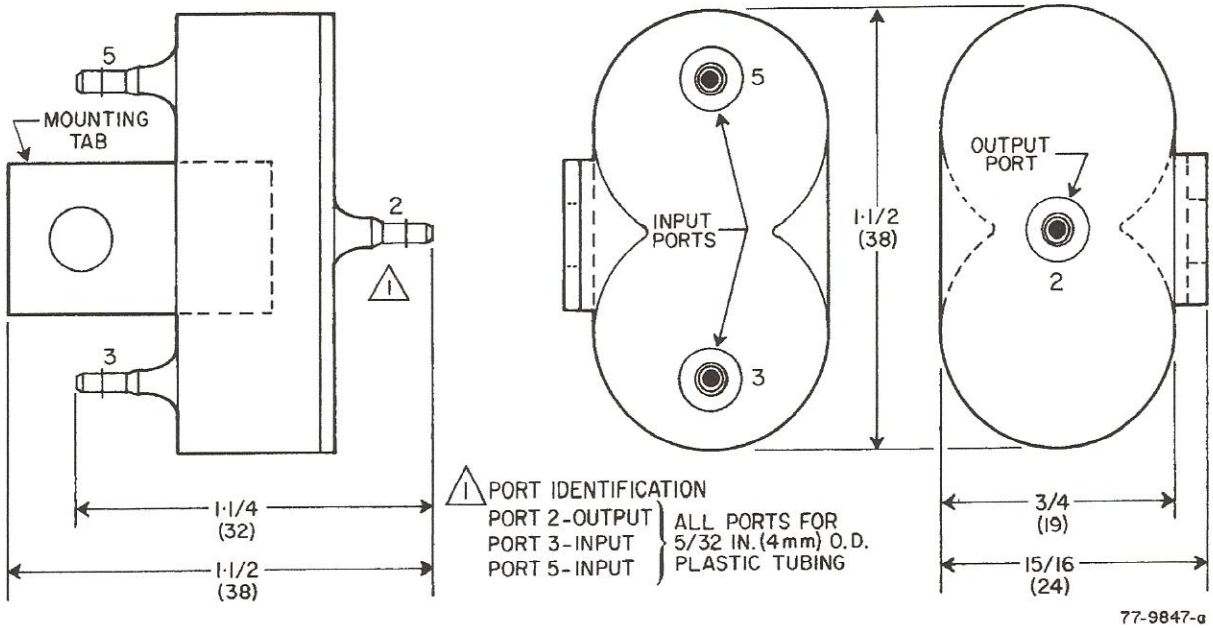


FIG. 1–APPROXIMATE DIMENSIONS OF RP973A IN INCHES (MILLIMETERS)

Form Number 77-9847
Commercial Div.
MLF TAB: II. C. 5.

Typical Operation
[Refer to Fig. 2]

In small ducts where a long averaging element is impractical or undesirable, averaging may be accomplished with two smaller rod type sensors such as LP914's. When temperature at the two sensors remains constant, the output of the RP973A Averaging Relay also remains steady, at the average of the two input signals.

On a change in temperature at one or both of the sensors the input pressure(s) to the RP973A changes. The relay output simultaneously shifts to the new average of the two inputs, thereby causing the controller to open or close a valve or damper to satisfy the averaged sensor requirements.

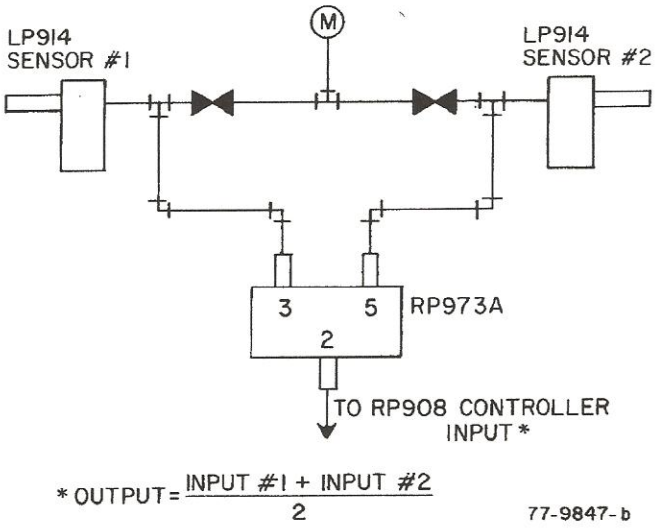


FIG. 2–TYPICAL OPERATION

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Matlack Industrial Center
207 Carter Dr Unit C
West Chester, PA 19382
800-356-3774

Honeywell

RP973A
Pneumatic Averaging Relay

INSTALLATION INSTRUCTIONS

DESCRIPTION

The RP973A is a three-port, direct-acting and averaging pneumatic relay that produces an output pressure equal to the average of the two input pressures. It is used in control systems where the average of two input pressures is required to operate a valve or damper motor.

Fig. 1 shows approximate dimensions.

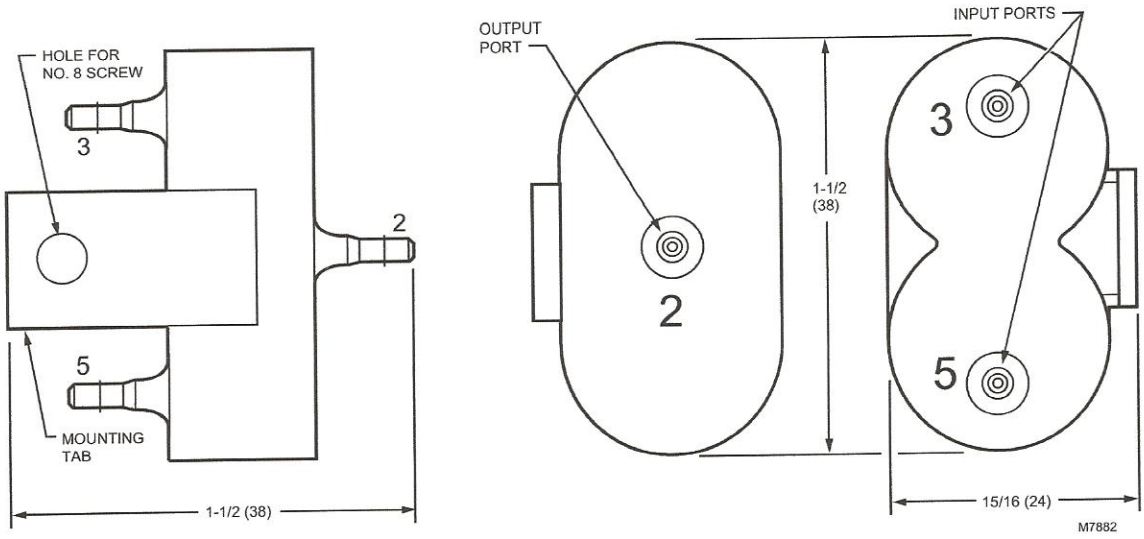

Fig. 1. RP973A dimensions in in. (mm).

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95-7253EF

INSTALLATION

Mounting

Suspend on tubing or mount on a surface. See Fig. 2.

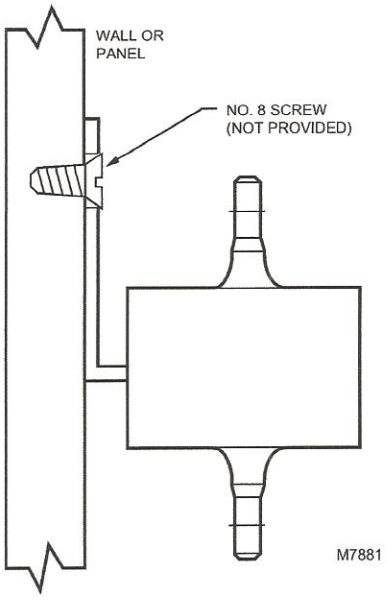

Fig. 2. Surface mounting.

Piping

Fig. 3.shows adaptation 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 tubing from the barb connections, cut tubing a few inches from the control device. Use a coupling to reconnect tubing.

NOTE: When the system is other than copper or polyethylene tubing, adapt as shown in Fig. 3. Some models provide parts for adapting.

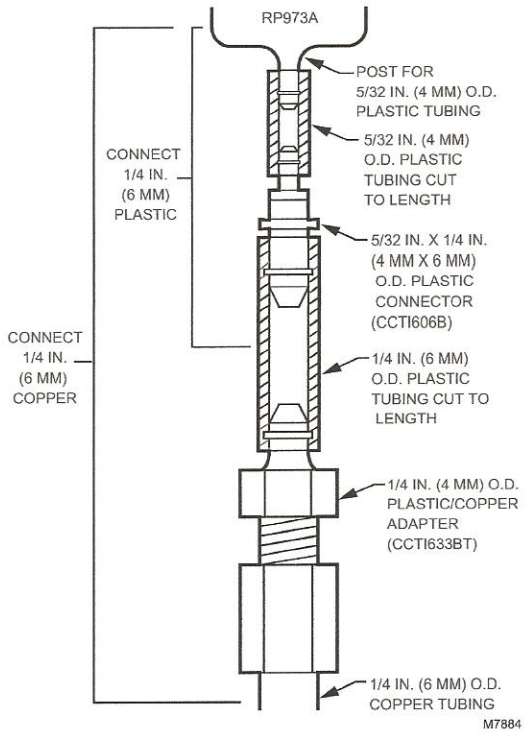

Fig. 3. Adaptation piping.

Port Identification Table

The two right column in Table 1 identify the ports of older Honeywell pneumatic relays when upgrading installation.

Table 1. Pneumatic Relay Ports.

	RP973A	RO904C	RO94C
Input A	5	P1	1A
Input B	3	P2	1B
Output	2	M	3
Main	—	—	2

Checkout and Test

The output should equal the average of the inputs within ±20 percent of the difference of the two inputs.

ENGINEERING DATA

Specifications

Model: RP973A Pneumatic Averaging Relay.

Operating Pressure Range:
Normal: 0 to 18 psi (0 to 124 kPa).
Maximum Safe: 30 psi (207 kPa).

Operating Air Pressure: 3 to 13 psi (21 to 90 kPa) input and output.

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

Air Consumption: .007 scfm max. (198 sccm).

Flow Capacity: .008 scfm (3.8 ml/s) at 18 psi (124 kPa) through either input with the other input and output (Port 2) at 0 psi (0 kPa).

Construction: Two filtered restrictions in a sonic welded plastic housing.

Operation

The RP973A consists of two 0.005 in. (0.127 mm) matched restrictors in a single housing. See Fig. 4.The two signals to be averaged are each fed through a restrictor to a common chamber. See Fig. 4A.

This construction ensures that the pressure at the output can never be more than the average of the two input pressures. This occurs often in valve-unit type averaging relays. The higher pressure flows through the restrictor and out the other input.

The output pressure is the average of the two input pressures within ±20 percent or ±0.7 psi (4.8 kPa) of the difference between the high and low. It always falls about half way between the two input pressures. The closer the input pressures are in psi (kPa), the more accurate the RP973A becomes. If the inputs are 3 and 13 psi (21 and 90 kPa), the output is 8 ±2 psi (55 ±14 kPa). See Fig. 4. If the inputs are closer, 12 and 13 psi (83 and 90 kPa), the output is closer to the average at 12.5 ±0.7 psi (86 ±5 kPa).

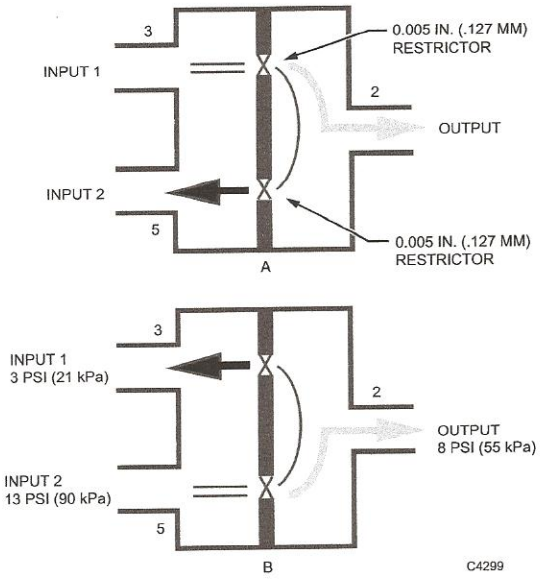

Fig. 4. RP973A operation.

Application

The RP973A averaging relay is a bleed-type device that requires its output line to be dead ended (0 scfm [0 ml/s] air consumption). See Fig. 5.

⚠ CAUTION

Equipment Damage Hazard.
Add an isolation relay (RP470B lockout relay) when an RP973 is feeding an air-consuming device such as another RP973A averaging relay or an SP970A,B pilot. See Fig. 5.

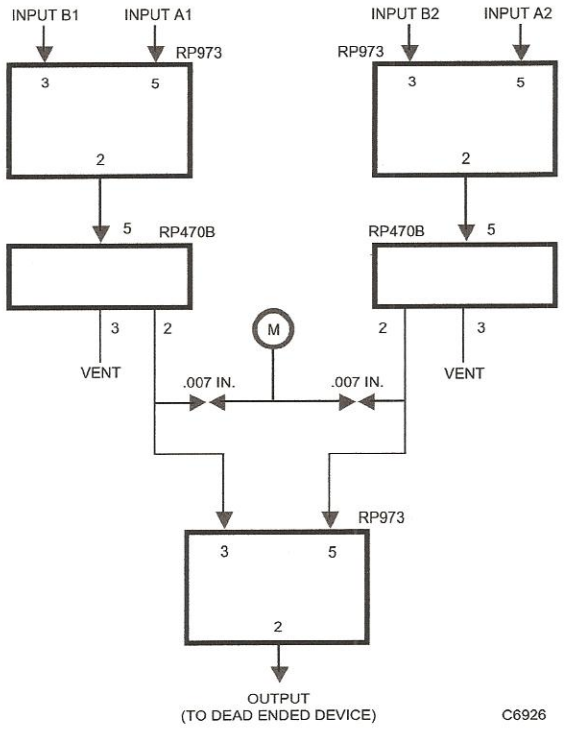

Fig. 5. Typical application using multiple RP973 relays.

⚠ CAUTION

Equipment Damage Hazard.
Not recommended for averaging sensor lines. For averaging sensor lines use the RP922A Pneumatic Potentiometer.

Because input signal air flows from higher to lower, do not use the RP973A on bleed-type thermostat lines. To average bleed-type devices, use an isolating (repeating) circuit. See Fig. 6. Refer to Fig. 7 for a typical application.

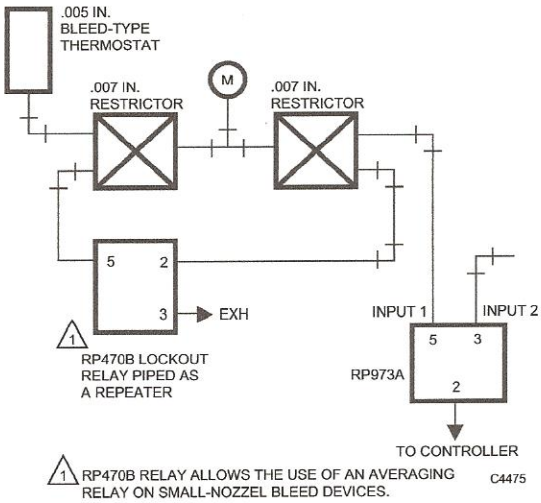

Fig. 6. RP973A in an isolating circuit.

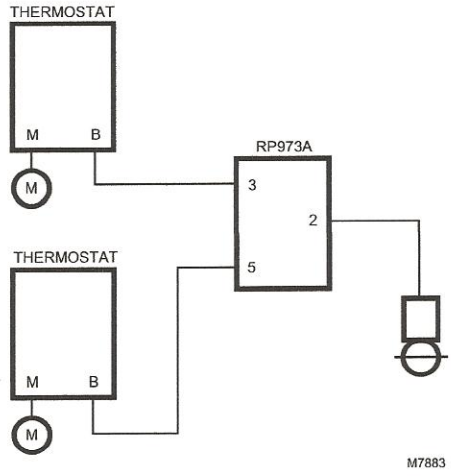

Fig. 7. Typical application.

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