

MODEL 40G CONTROL RELAY

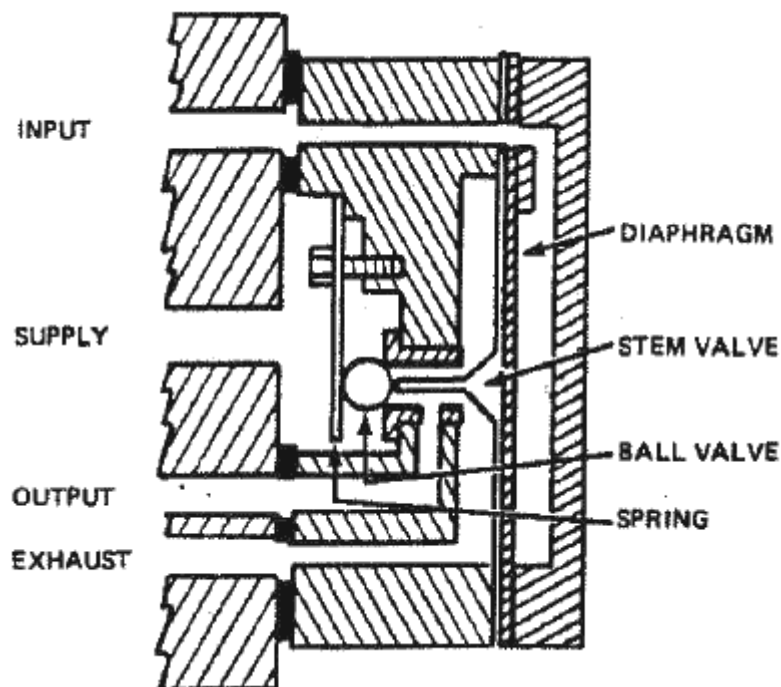
Part C0135YW

A relay is a pneumatic amplifier. Like its electronic counterpart, the function of the relay is to convert a small change in the input signal (an air pressure signal) to a large change in the output signal. Typically a 7 kPa or 1 psi change in the input will produce approximately an 80 kPa or 12 psi change in the output.

Principle of Operation

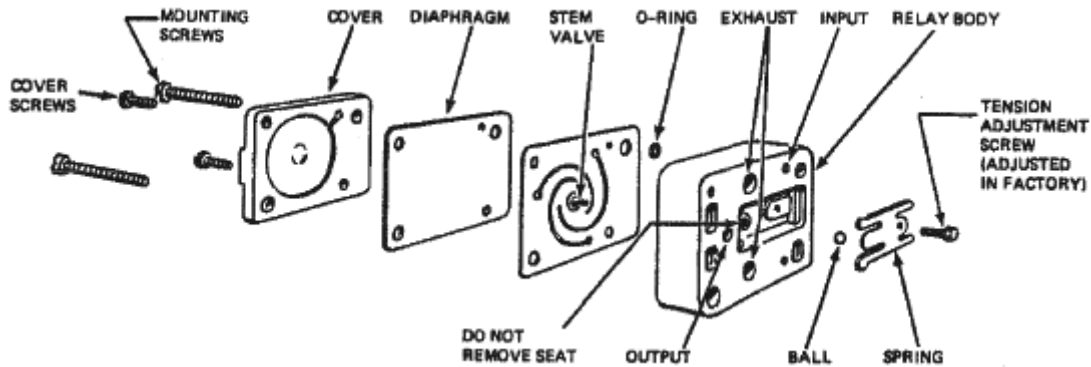
The air supply enters the relay through a port on the surface of the instrument on which the relay is mounted. The input signal (nozzle pressure) enters the relay through another port and acts on the diaphragm. Since the diaphragm is in contact with a stem valve, the two move in unison.

As the input signal increases, the stem pushes against a ball valve which in turn moves a flat spring, allowing the supply air to enter the relay body. Further motion of the stem valve causes it to close off the exhaust port. Thus, when the input pressure increases, the stem (exhaust) valve closes and the supply valve opens; when the input decreases, the stem valve opens and the supply valve closes. This varies the pressure to the output.



Servicing

Exploded View



NOTE

If adjustment of tension screw is changed, relay must be recalibrated. If calibrating fixture is not available, perform one of the procedures mentioned in the section “To Maintain Calibration After Reassembly”.

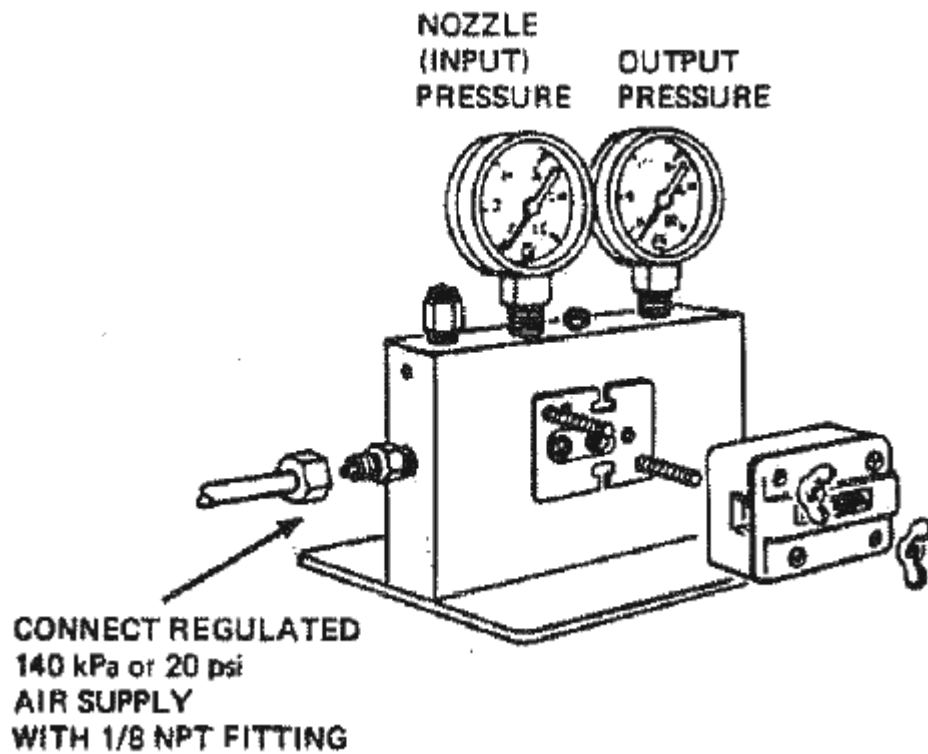
Cleaning the Relay

Should the relay require cleaning, remove the cover and adjacent loose parts, flush with a suitable solvent (such as trichlorethylene), and dry carefully with compressed air. In reassembling the relay, all corresponding holes must line up and all outside edges must coincide with those of the relay body casting.

Should further cleaning be required, remove the tension screw (refer to the note in the previous section) and clean the spring and ball. When installing the spring (by tightening the tension screw) make sure that the spring holds the ball in position in its seat. Then calibrate the relay.

Calibration

This procedure requires a calibrating fixture, Part C0130LB (psi) (kPa), obtainable from Invensys.



1. Position relay as shown and mount it on fixture. Turn on air supply.
2. Seal nozzle valve with finger until nozzle pressure (on left gauge) is about 100 kPa or 15 psi. Repeat several times.

— **! CAUTION** —

Do not exceed specified pressure or gauge may be damaged.

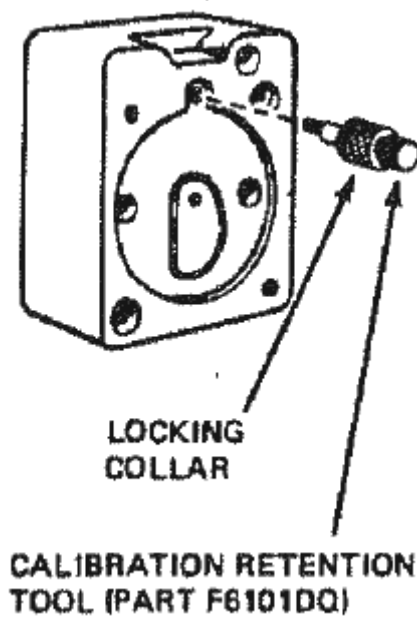
3. Adjust nozzle valve (use 1/4 inch open-end wrench) so that nozzle pressure is 20 kPa or 3 psi.
4. Position handle of hex-socket wrench (at rear of fixture) so that the wrench engages head of tension screw inside relay. Adjust tension screw so that output pressure is 60 kPa or 9 psi.

To Maintain Calibration After Reassembly

(Refer to Note on page 2.)

The procedures below enable the tension screw to be inserted back to its original position; thus putting approximately the same tension on the spring that it had before disassembly. With both procedures first remove the relay cover and adjacent loose parts.

Using Calibration Retention Tool



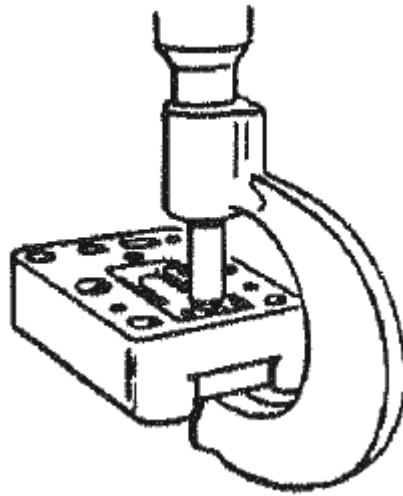
Screw locking collar against the head of calibration retention tool. Before removing tension screw, insert tool into opposite end of tension screw hole and tighten finger tight. Tighten locking collar against relay. Remove tension screw.

When reinserting tension screw, tighten it against calibration retention tool and then remove tool from relay.

NOTE

If calibration retention tool is not available, a .099-56 (3-56) screw can be used instead.

Without Using Calibration Retention Tool



Using a micrometer, measure distance from head of tension screw to surface on underside of body.
When reinstalling screw, tighten it so that measured distance above is maintained.

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