

Engineered for life

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WARNING
Conoflow's products are designed and manufactured using materials and workmanship required to meet all applicable standards. The use of these products should be confined to services specified and/or recommended in the Conoflow catalogs, instructions, or by Conoflow application engineers.
To avoid personal injury or equipment damage resulting from misuse or misapplication of a product, it is necessary to select the proper materials of construction and pressure-temperature ratings which are consistent with performance requirements.

INSTRUCTION AND MAINTENANCE MANUAL
GT\_8 Series Milliamp I/P Transducer

CAUTION: These instructions should be read and understood prior to installation, use or maintenance.

GENERAL PRODUCT OVERVIEW

This I/P transducer is a force-balanced unit which uses a fixed filtered air inlet pressure, accepts a DC milliamp input signal and converts it to a proportional air output pressure. Models are available with an integral relay booster (GT28, GT48, and GT68) or without the booster (GT18, GT38, and GT58).

SPECIFICATIONS

- Input Range: 4-20 or 10-50 mA DC
Nominal Impedance: 4-20 mA model: 145 ohms, 10-50 mA model: 60 ohms
Output Signal: 3-15, 3-27 or 6-30 PSIG (21-103, 21-186 or 41-207 kPa)
Required Air Supply: GT18, GT28: 25 PSIG (172 kPa), GT38, GT48, GT58 or GT68: 35 PSIG (241 kPa)
Air Consumption: GT18, GT28: 0.20 scfm (6 slpm) max, GT38, GT48, GT58 and GT68: 0.30 scfm (8.5 slpm) max
Air Delivery Rate: GT18: 0.15 scfm (4.3 slpm) max, GT28: 5 scfm (142 slpm) max, GT38: 0.15 scfm (4.3 slpm) max, GT48: 5 scfm (142 slpm) max, GT58: 0.15 scfm (4.3 slpm) max, GT68: 5 scfm (142 slpm) max
Exhaust Rate: GT18: 0.17 scfm (5 slpm) max, GT28: 1.7 scfm (50 slpm) max, GT38: 0.2 scfm (6 slpm) max, GT48: 2.3 scfm (65 slpm) max, GT58: 0.2 scfm (6 slpm) max, GT68: 2.3 scfm (65 slpm) max

Linearity: +/- 1.5% of output span

- Temperature Effect: 0.2% of output span / 10 °F change, For a 2 °F / minute rate of change^2
Temperature Range: 0 °F to 150 °F (-18 °C to 66 °C)
Approximate Weight: Approx. 7 lb (3.2 kg) – Std. Units
Piping Requirements: 3/8" Tubing or 1/4" Pipe (minimum)

NOTES:

- 1. A Conoflow FR95 Airpak filter regulator or equivalent is recommended for the filtered air supply.
2. Models without a booster relay have a temperature effect rating of approximately 0.1% of output span / 10 °F for a 2 °F / minute rate of change.
3. Low volume models (GT18, GT38, GT58) do not have a booster relay and should only be used in low volume flowrate applications.

Prior to installation, inspect the package and product for damage. Do not use if damaged. Verify operation, and calibrate the transducer using the procedure on page 4.

INSTALLATION

See figure 1 (page 2) for location of connection interfaces

ELECTRICAL CONNECTION: The electrical connection for the input signal is made through a 1/2" NPSM or 1/2" NPT conduit connection on the side of the transducer housing body. Unscrew the cover and connect the positive lead to terminal 2 and negative to terminal 1.

For reverse acting models, connect the positive lead to terminal 1 and the negative lead to terminal 2.

PNEUMATIC CONNECTION: Connect the supply pressure line to the 1/4" NPT inlet port (stamped "IN"). A clean, filtered air supply (25 psi for the GT18 or GT28; 35 psi for the GT38, GT48, GT58 or GT68 model) is required.

The 1/4" NPT output signal port delivers a pneumatic signal in proportion to the mA DC input signal. Minimum (output) piping requirements are 3/8" tubing or 1/4" pipe to deliver specified air flow.

**CAUTION:** Teflon tape is the preferred thread sealant for the 1/4" NPT connections. Liquid thread sealant can migrate to the fixed orifice of the transducer and create unreliable operation.

**CAUTION:** If the air supply line is connected to the output signal port, transducer damage could occur.

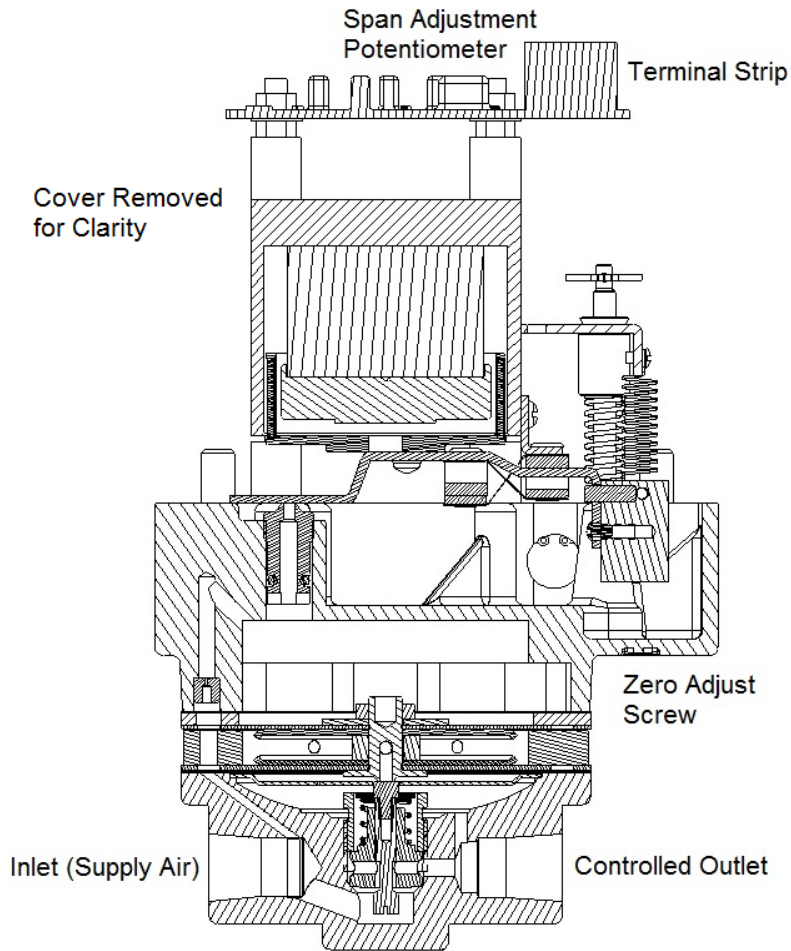


Figure 1 – Interfaces and calibration / adjustment locations

## PRINCIPLE OF OPERATION

An increase in coil signal current drives the coil downward, out of the magnet assembly, pushing the balance beam toward the pilot nozzle. This action reduces the flow through the pilot nozzle, increasing the backpressure.

For low volume models (GT18, GT38, or GT58), this is the controlled output pressure.

For relay equipped models (GT28, GT48 or GT68), this pressure above the diaphragm assembly drives the diaphragm downward, opening the relay nozzle and increasing the output pressure. The output pressure will continue to increase until it is equal to the pilot nozzle backpressure on top of the diaphragm, and the forces are balanced.

A decrease in the input signal allows the coil to move into the magnet assembly, which moves the beam away from the pilot nozzle. This allows the flow through the nozzle to increase, which reduces the pressure above the diaphragm assembly.

Since the output pressure is greater than the pilot nozzle pressure, the diaphragm will move upward, allowing the relay valve to close and the exhaust flow path to open. Air will flow from the output side of the transducer and flow through the relief port in the diaphragm assembly, venting to atmosphere through exhaust holes in the diaphragm spacer. This relieving / exhausting action reduces the output pressure of the transducer until equilibrium is established.

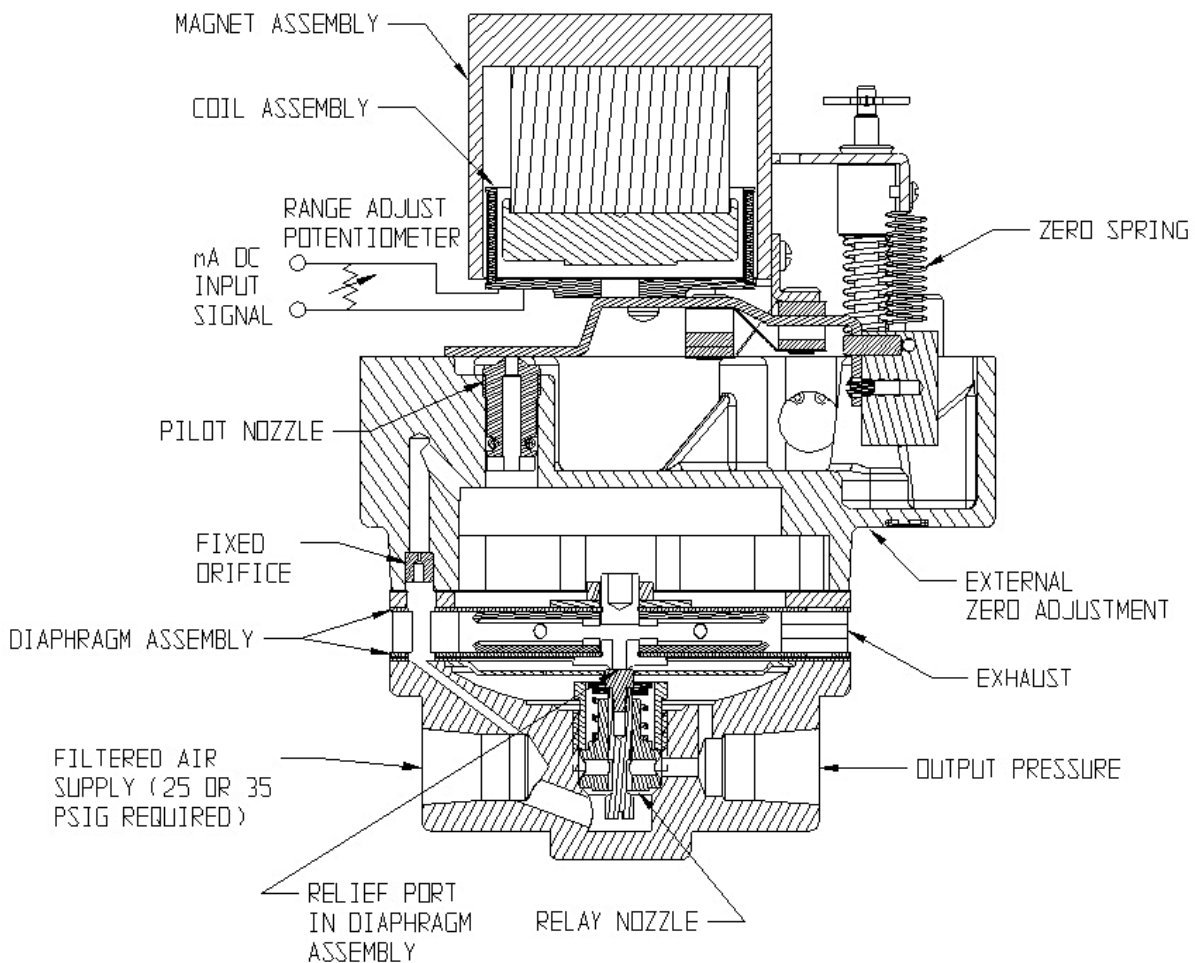


Figure 2 – Partial sectional view of transducer

## CALIBRATION AND ADJUSTMENTS

For adjustment and/or calibration verification, use the following calibration procedure:

1. Connect the required air supply pressure (25 psig for the GT18 and GT28, 35 psig for all others) to the inlet of the transducer, and a pressure gauge to the outlet.
2. Connect the electrical input and set the input signal to the 0% value (e.g. 4 mA for a direct acting 4-20 mA unit).
3. Observe the output pressure. Adjust if necessary by turning the external zero adjust screw located under the cap near the output pressure connection.
4. Increase the electrical input signal to the 100% value (e.g. 20 mA for a direct acting 4-20 mA unit).
5. Observe the output pressure. If adjustment is necessary, remove the cover cap and adjust the range potentiometer on the circuit board to obtain the required output.
6. The zero and range adjustments are interactive. After adjusting the range potentiometer it will be necessary to recheck the zero. Repeat steps 2 through 5 until both endpoints are at the required values.

## MAINTENANCE

Under normal conditions, no maintenance should be required. If disassembly is necessary, refer to PNEUMATIC TROUBLESHOOTING section of this document. It is important that clean, dry air be supplied to the unit at all times. An ITT Conoflow FR95 series Airpak (filter regulator) or equivalent filtered air supply can be used to supply this I/P transducer

For pressure relay equipped models (GT28, GT48, or GT68) periodically inspect the diaphragm assembly to see if the diaphragm assembly shows signs of wear. To inspect, remove the six (6) machine screws from the relay. While the relay is disassembled from the I/P transducer, check freedom of movement of the relay valve, and remove any foreign matter which may have accumulated. When reassembling the relay, be sure to properly orient the relay body to align the feed hole from the inlet port to the fixed orifice in the housing cap. Tighten the six (6) machine screws to 24 in-lb.

For replacement components, contact the factory with the full model number and serial number of the product that parts are required for.

## TROUBLESHOOTING

### *PNEUMATIC*

1. Check supply pressure. It should be constant 25 psig (172 kPa) for the GT18 or GT 28 models, or a constant 35 psig (241 kPa) for all other models.
2. Make sure that tubing connections are tight.
3. Check zero and span calibration as previously outlined.
4. Check to see if housing body screen or flame arrestor (XP version) is obstructed.
5. If disassembly is necessary, it must be done in a clean work area. Should foreign debris become lodged between the coil assembly and the magnet assembly, a malfunction may occur. Removal of the magnet assembly will destroy the calibration of the nozzle and balance beam relationship.
6. If resonance (humming) is experienced, check outlet piping to be sure it meets the minimum requirements specified under INSTALLATION.

### *ELECTRICAL*

1. Check to see that the input signal leads are connected to proper terminals (see ELECTRICAL CONNECTION section).
2. Make sure there are no loose wires at terminal or solder connections.
3. Some field calibrators may not be able to supply sufficient current to this transducer. Verify the input DC mA signal using a digital ammeter.
4. Check input impedance by connecting an ohm meter to terminals 1 and 2. In making any resistance tests, the input signal wires from the controller (mA source) must be disconnected. Nominal total input impedance of the 4-20 mA unit is 145 ohms. Nominal total input impedance of the 10-50 mA unit is 60 ohms. Do not change the setting of the range adjust potentiometer on the printed circuit board when performing input impedance test.
5. A measure of resistance between any terminal of the transducer and the external case should indicate an "open" circuit. If resistance is indicated, coil windings or the leads to the voice coil may be touching the case. Further checks must then be made.
6. Remove housing from the transducer and disconnect the coil lead plug from the circuit board. Check the impedance of the coil. Nominal impedance is approximately 150 ohms.