ITT Conoflow

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Engineered for life

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
IEEE QUALIFIED TRANSDUCER

MODELS

GT25_*_A1826 3-15 PSI (21-103 kPa) OUTPUT
GT45_*_A1826 3-27 PSI (21-186 kPa) OUTPUT
GT65_*_A1826 6-30 PSI (41-207 kPa) OUTPUT

_*_ C = 4-20 mA DC Input
D =10-50 mA DC Input

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

GENERAL PRODUCT OVERVIEW

This transducer is a force-balanced unit which accepts a DC milliamp input signal and converts it to a proportional output pressure.

Conoflow's IEEE qualified transducers have been qualified in accordance with requirements of IEEE 323-1974 and the recommended practices of IEEE 344-1975. The test program included Thermal Aging, Radiation Aging, Wear Aging, Seismic Qualification and Steam Line Break testing. For details of test conditions consult the factory.

SPECIFICATIONS

Input Range:	4-20 or 10-50 mA DC
Output Signal:	3-15, 3-27 or 6-30 PSIG (21-103, 21-186 or 41-207 kPa)
Required Air Supply:	**GT25:** 25 PSIG (172 kPa) **GT45/65:** 35 PSIG (241 kPa)
Air Consumption:	**GT25:** 0.20 scfm (5.7 slpm) max **GT45/65:** 0.30 scfm (8.5 slpm) max
Air Delivery Rate:	5 SCFM (142 slpm) max
Exhaust Rate:	3 SCFM (85 slpm) max
Linearity:	+/- 1.50% of output span
Temperature Effect:	0.25% of output span / ° F
Temperature Range:	0 °F to 150 °F (-18 °C to 66 °C)
Approximate Weight:	12 1/2 lbs (5.7 kg)
Piping Requirements:	3/8" Tubing or 1/4" Pipe (minimum)

Note: IEEE Qualification validates ability to operate at higher temperatures. Temperature Range is for conformance to published specifications.

INSTALLATION

See figure 1 (page 2) for connection interfaces

ELECTRICAL CONNECTION: The electrical connection for the input signal is made through a 1/2" NPSM 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.

PNEUMATIC CONNECTION: Connect the supply pressure line to the ¼" NPT inlet port (stamped "IN"). A clean, filtered air supply (25 psi for the GT25; 35 psi for the GT45 or GT65 model) is required. An optional GFH25XT1767 series IEEE Qualified filter regulator is available for this purpose.

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.

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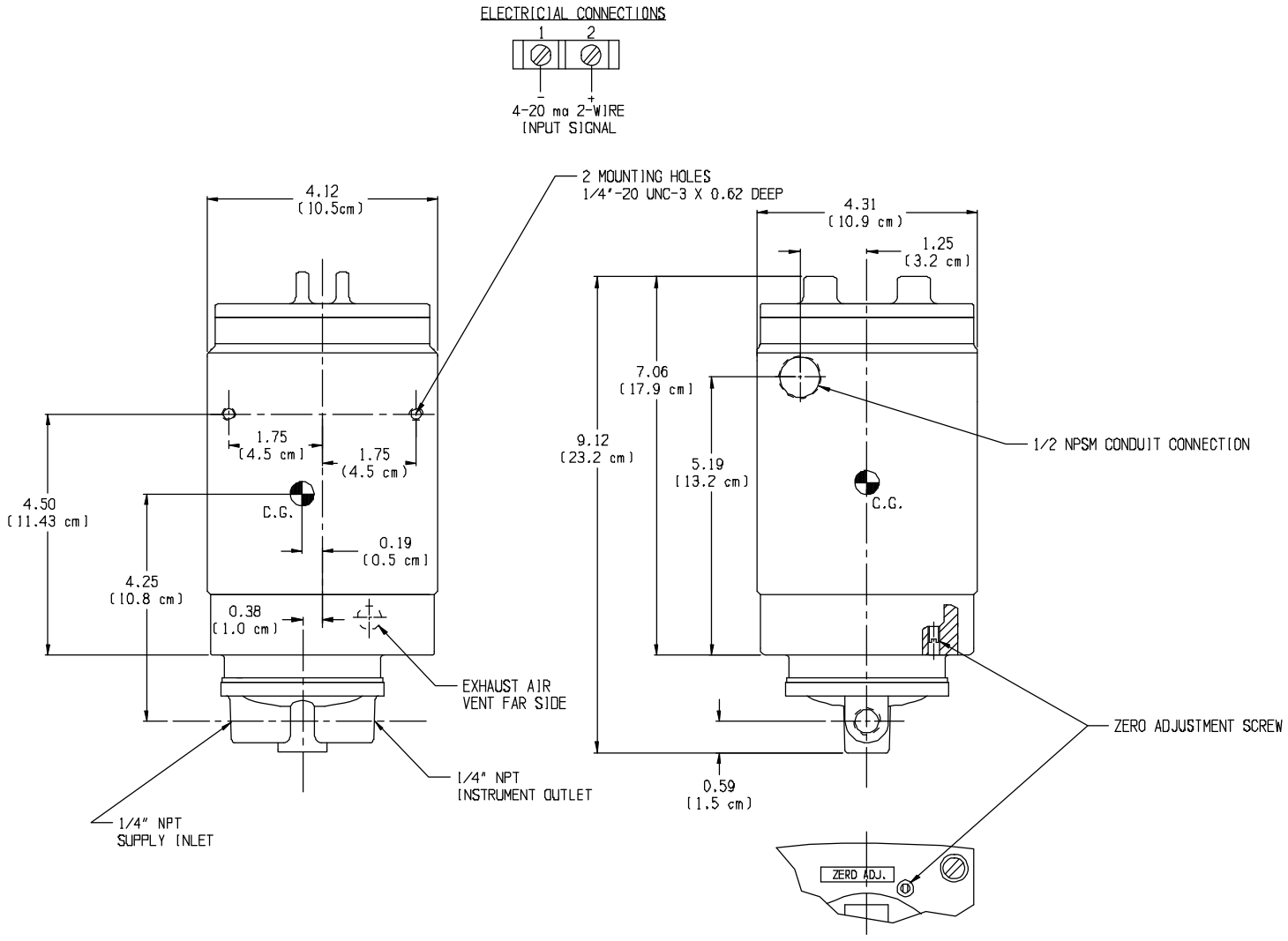

Figure 1 – Transducer dimensions with interface / connections.
For Certified Dimensional Drawing, Refer to A28-16

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PRINCIPLE OF OPERATION

An increase in input signal 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 above the diaphragm assembly.

The increased 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 back pressure above the diaphragm assembly. Since the output pressure is greater than the pilot nozzle backpressure, the diaphragm will move upward allowing the relay valve to close and the exhaust valve 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.

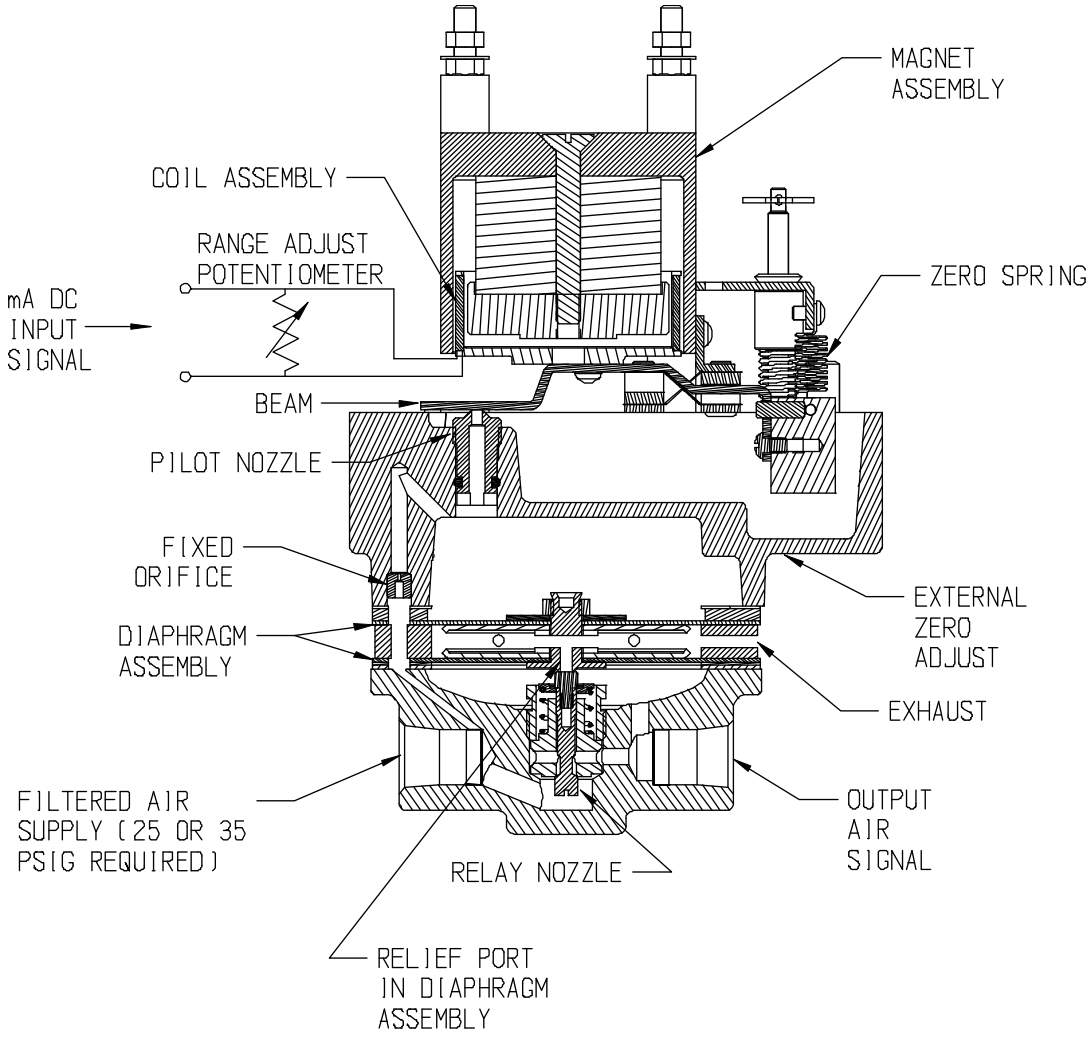

Figure 2 – Partial sectional view of transducer

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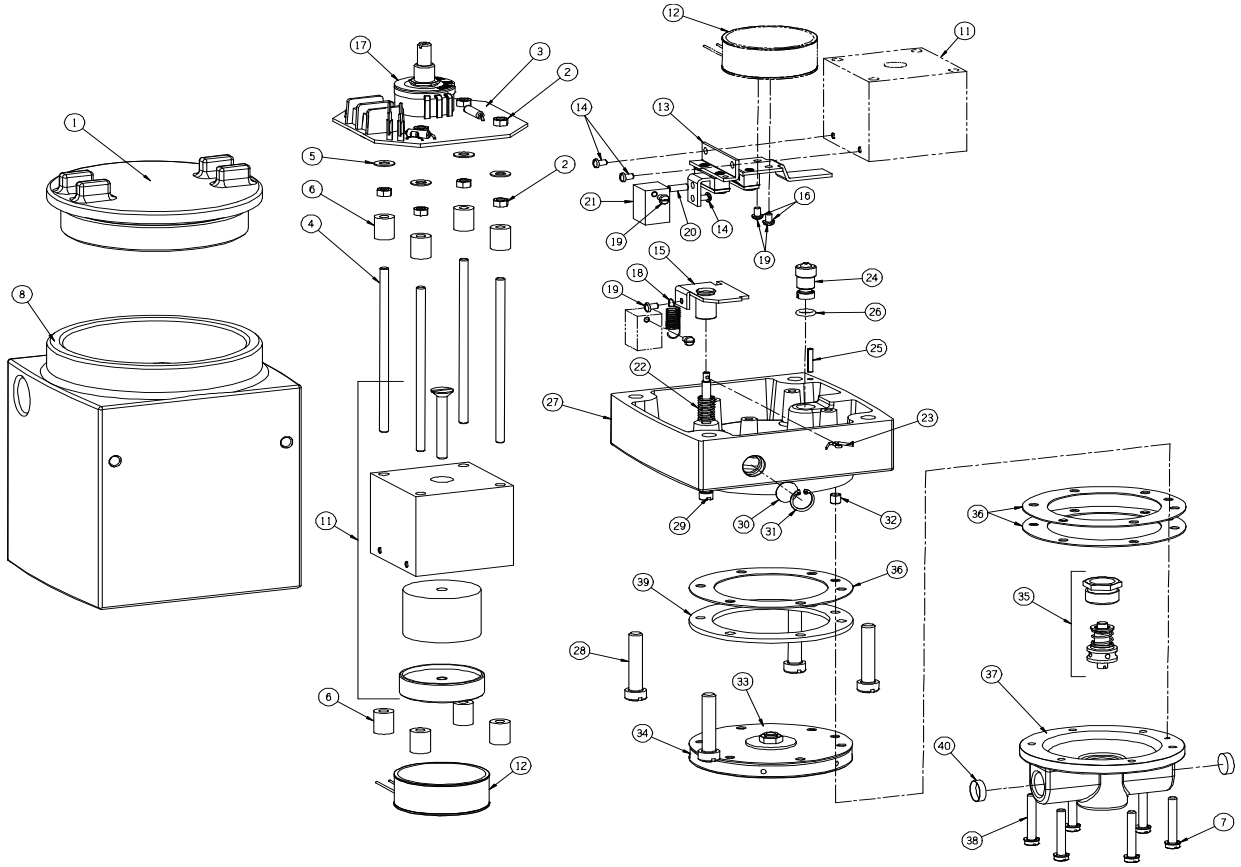

Item No.	Description	Qty. Req'd	Part No.
1	Housing Cover	1	G6374805
2	Hex Nut, 8-32	8	G6900203
3	PCB Assembly (4-20 mA) (10-50 mA)	1	G6379184 G6389493
4	Stud, 4-40	4	G6073365
5	Washer, Flat Fiber	4	G6076384
6	Spacer	8	G6072839
7	Lockwasher, Split #8	6	G6900307
8	Housing Body	1	G6374847
9	Bracket, Mounting	-	G6072482
10	Screw, ¼-20 FHMS	2	G6900091
11	Magnet Assembly	1	G6385207
12	Coil / Lead Assembly	1	G6384589
13	Flexure Assembly	1	G6384593
14	Screw, 4-40 RHMS (Steel)	2	G6900005
15	Zero Adjust Sub-Assy	1	G6072672
16	Lockwasher, Split #4	2	G6900301
17	Nameplate, Range Adjust	1	G6332142
18	Spring, Extension	1	G6073316
19	Screw, 4-40 RHMS (Brass)	4	G6900008
20	Dowel Pin, 1/8	1	G6076541

Item No.	Description	Qty. Req'd	Part No.
21	Counterweight	1	G6073373
22	Spring, Compression	1	G6073332
23	Cotter Pin, 3/64 Brass	1	G6900403
24	Pilot Nozzle (3-15 PSI) (3-27 / 6-30 PSI)	1	G6072656 G6073613
25	Roll Pin, 1/8	1	G6076202
26	O-ring, size -008, Viton	1	G6379192
27	Cap, Housing	1	G6386858
28	Screw, FIHMS ¼-20	4	G6900090
29	Zero Adjust Screw	1	G6072714
30	Screen	1	G6016018
31	Retaining Ring	1	G6076012
32	Orifice, Fixed Brass	1	G6072474
33(1)	Diaphragm Assembly	1	G6384464
34	Spacer, Diaphragm	1	G6073514
35	Nozzle Assembly	1	G6020986
36	Gasket, Viton	3	G6379218
37	Body, Relay	1	G6072490
38	Screw, FIHMS 8-32	6	G6900048
39	Spacer	1	G6351191
40	Screen, Relay Body Port	2	G6072649

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NOTES REGARDING SPARES AND AVAILABLE ASSEMBLIES:

1. Recommended spare part – Diaphragm Assembly (Item 33)
2. When ordering spare parts, specify catalog no., item no., and item part no. This will permit positive identification and rapid handling of order.
3. Assemblies are available which consist of the following:

   G6384592 Magnet Housing Sub-Assembly (for 3-15 psig output range):
   Items 2 (4 pcs), 4, 6, 11 - 14, 16, 19, 24 - 27, and 30-32
   G6385124 Magnet Housing Sub-Assembly (for 3-27 or 6-30 psig output range):
   Items 2 (4 pcs), 4, 6, 11 - 14, 16, 19, 24 - 27, and 30-32
   G6384595 Cap Assembly: Items 25, 27, and 32
   G6384411 Relay Body Assembly: Items 35, 37 and 40

CALIBRATION AND ADJUSTMENTS

Should field adjustment be required, use the following calibration procedure:

1. Connect the recommended air supply 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 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 pressure inlet connection.
4. Increase the electrical input signal to the 100% value (e.g. 20 mA for a 4-20 mA unit).
5. Observe the output pressure. If adjustment is necessary, remove the cover 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 model GFH25XT1767F Airpak (filter regulator) is provided or available for this purpose. Occasional replacement of the filter in the Airpak is required (see Instruction and Maintenance Manual GFH25-IOM).

Periodically inspect the diaphragm assembly to see if the diaphragms show signs of wear. To inspect the diaphragms, remove the fillister head machine screws (38) and lockwashers (7) and the diaphragm spacer (34). While the relay is disassembled, 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. This is illustrated in the exploded view with a center line.

TROUBLESHOOTING

PNEUMATIC

1. Check supply pressure. It should be constant 25 psig (172 kPa) for the GT25 or a constant 35 psig (241 kPa) for the GT45 or GT65 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 (30) 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 580 ohms. Nominal total input impedance of the 10-50 mA unit is 235 ohms.

   NOTES:

   Do not change setting of range adjust potentiometer on printed circuit board while performing this test.

   A measure of resistance between any terminal of the transducer and the external case should indicate an “open” circuit. If resistance is indicated, voice coil windings or the leads to the voice coil may be touching the case. Further checks must then be made.

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