

**Installation Guide**  
**Alpha Instruments Model 164**  
**Differential Pressure Transducers**

Every Model 164 has been tested and calibrated before shipment.

Alpha Instruments M164 pressure transducers sense differential or gauge (static) pressure and convert this pressure difference to a proportional high level analog output for both unidirectional and bidirectional pressure ranges. Three standard output versions are offered: Voltage output of 0 to 5 VDC, 0 to 10VDC and current output of 4 to 20mA.

**Media Compatibility:**

Model 164 transducers are designed to be used with air or nonconducting gases. Use with liquids or corrosive gases will damage the unit.

**Environmental Requirement:**

Operating Temperature	0 ~ 170°F (-18 ~ 77°C)
Compensated Temperature Range	40 ~ 170°F (4 ~ 77°C)
Temperature Drift	<0.025%FS/°F (<0.045%FS/°C)

**Pressure Fittings:**

The Model 164 is designed to be used with 3/16" I.D. push-on tubing. 8mm barbed brass pressure fittings and other possible pressure fittings are optional. The positive (high) pressure port and the reference (low) pressure port are labeled "+" and "-" respectively. For best results (shortest response times), 3/16" I.D. tubing is suggested for tubing lengths up to 80 feet (25 meters), 1/4" I.D. for tubing lengths up to 250 feet (75 meters), and 3/8" I.D. for tubing lengths up to 720 feet (220 meters).

**Electrical Installation (Voltage Output):**

The Model 164 voltage output is a 3-wire circuit, with three terminals available for wiring. These terminals have the designation "+", "O" and "-" (See Diagram 1). The power supply and signal references are commond on the circuit (See Diagram 2).

The model 164 voltage has a 0-5 or 0-10 VDC output. (See Diagram2).

The 164 voltage output can operate from 12-32VDC excitation. The unit is calibrated at the factory with a 24 VDC power, 50KΩ load resistor.

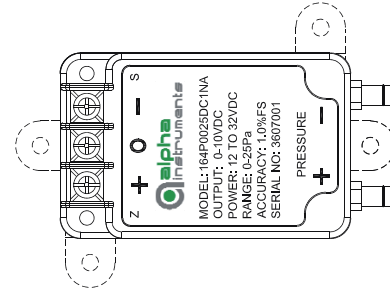


Diagram 1

**Voltage Circuit Diagram**

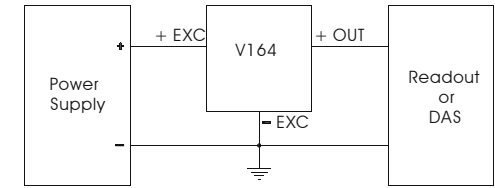


Diagram 2

- "+": Connect to positive terminal of DC power supply.
- "O": Connect to positive terminal of control or pressure monitor.
- "-": Connect as the reference for power supply and output signal.

**Electrical Installation(Current Output):**

The Model 164 is a two-wire loop-powered 4 to 20mA current output unit and delivers rated current into any external load of 0 to 1000 ohms. These terminals have the designation of "+" and "-" (See Diagram 3). The current flows into the + terminal and returns back to the power supply through the - terminal (See Diagram 4).

The 164 current output can operate from 12-32VDC excitation. The unit is calibrated at the factory with a 24 VDC loop supply voltage and a 250ohm load.

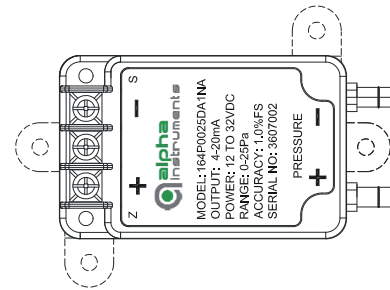


Diagram 3

**Current Circuit Diagram**

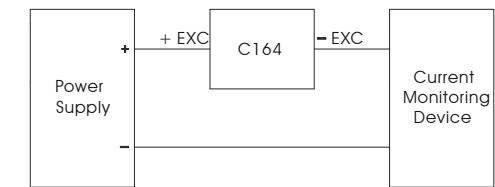


Diagram 4

The below table shows the maximum wire and receiver resistances as a function of supply voltage.

V <sub>min</sub>	V <sub>max</sub>	R <sub>min</sub>	R <sub>max</sub>	RL at Supply Voltage (Vs)
12	32	0	1000	RL ≤ 50(Vs-12)

For Example: Voltage is 24VDC, RL ≤ 50(24-12)=600Ω, the load resistance should not exceed 600Ω.

**Calibration:**

The 164 transducer is calibrated in vertical mounting position at the factory, there might be a zero shift when using in other positions, zero adjustment is accessible under the small cap of the unit.

**Zero Adjustment:**

While monitoring the output of the unit and with both pressure ports open to atmosphere, the zero may be adjusted by turning the zero adjustment screw to:

Voltage Output:

Unidirectional Pressure Ranges: 0VDC

Bidirectional Pressure Ranges: 2.5VDC or 5.0VDC

Current Output:

Unidirectional Pressure Ranges: 4mA

Bidirectional Pressure Ranges: 12mA

**RETURNING PRODUCTS FOR REPAIR:**

Please contact Alpha Instruments before returning unit for repair to review information relative to your application.

The material should be carefully packaged and shipped prepaid to:

Alpha Instruments Inc.

131 Nonset Path

Acton, MA01720, USA

Attn: Repair Department

To assure prompt handling, please supply the following information and include it inside the package or returned material:

1. Name and phone number of person to contact
2. Full description of the malfunction
3. Identify any hazardous material used with product.

Notes: Please remove any pressure fittings and plumbing that you have installed and enclose any required mating electrical connectors and wiring diagrams. Alpha Instruments will repair and return of the unit as soon as possible. Non-warranty repairs will not be made without customer approval and a purchase order to cover repair charges.

**LIMITED WARRANTY AND LIMITATION OF LIABILITY:**

Alpha Instruments its products to be free from defects in materials and workmanship, subject to the following terms and conditions: Without charge, Alpha Instruments will repair or replace products found to be defective in materials or workmanship within the warranty period. Including:

- a) the product has not been subjected to abuse, neglect, accident, incorrect excitation, improper installation or servicing.
- b) the product has not been repaired or altered by anyone except Alpha Instruments.
- c) the serial number or date code has not been removed, defaced or otherwise changed.
- d) Alpha Instruments is notified in advance of and the product is returned to Alpha Instruments transportation prepaid.

Unless otherwise specified in a manual or warranty card, or agreed to in Writing and signed by an Alpha Instruments officer, Alpha Instruments pressure products shall be warranted for three years from date of sale.

Alpha Instruments' liability for breach of warranty is limited to repair or replacement, or if the goods cannot be repaired or replaced, to a refund of the purchase price. Alpha Instruments' liability for all other breaches is limited to a refund of the purchased price. In no instance shall Alpha be liable for incidental or consequential damages arising from a breach of warranty, or from the use or installation of its products.

No representative or person is authorized to give any warranty other than as set out above or to assume for Alpha Instruments any other liability in connection with the sale of its products.

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