

# P290M

# Pneumatic-to-Current P/I Transducer

## Installation, Operation and Maintenance Instructions

The ControlAir P290M is a pneumatic-to-current P/I transducer. Due to its over-engineered design, 100% burn-in and demanding QC test protocols you can expect years of unerring performance. As with any quality instrument, proper attention to the installation, wiring and calibration procedures is critical to the performance and longevity of the unit.

**CAUTION**

*This unit is only to be used with dry instrument air filtered to 40 microns. Excessive moisture or chemical contaminants can damage internal components.*

**CAUTION**

*The P290M can withstand over-pressurization of three (3) times the rated full scale without recalibration and four (4) times the full scale without damage to the transducer. DO NOT apply more than four (4) times the full scale rated pressure.*

**CAUTION**

*This unit can tolerate a maximum of 100 VDC at the input terminals indefinitely, although operation within published specifications is only guaranteed with power supplies between 10 and 42 VDC.*

**CAUTION**

*FIELD REPAIR IS NOT ADVISED. Please contact ControlAir for any warranty requirements.*

**CAUTION**

*DO NOT subject this transducer to a temperature above 180°F or below -40°F.*

## SPECIFICATIONS

<b>Inputs</b>	Instrument Air: 3-15 psig (0.2-1.0 bar) 3-27 psig (0.2-1.8 bar) 6-30 psig (0.4-2.0 bar)
<b>Maximum Input</b>	3 times full scale without recalibration 4 times full scale without failure
<b>Outputs</b>	2 wire: 4-20 mA, with over-current limit
<b>Allowable Loads (24 VDC Power)</b>	2-wire: 700 $\Omega$ , standard
<b>Accuracy</b>	$\pm 0.15\%$ of span guaranteed; $\pm 0.10\%$ of span typical. Includes combined effects of linearity, hysteresis and repeatability errors.
<b>Hysteresis</b>	Negligible
<b>Repeatability</b>	$\pm 0.10\%$ of span max; $\pm 0.03\%$ of span typical
<b>Resolution</b>	Infinite
<b>Output Ripple</b>	None
<b>Protection</b>	Reverse polarity, transient, over-current
<b>Response Time</b>	10 m Sec to 99% of step change
<b>Temperature Stability</b>	Span and Zero: +0.007% of span per °F maximum deviation from 77°F calibration
<b>Power Supply Stability</b>	Less than 0.005% of span change in output per volt change at the input terminals
<b>Power Supply</b>	10 VDC min. to 42 VDC max. at input terminals
<b>RFI/EMI Effect</b>	Meets or exceeds SAMA PMC 33.1, 1978, 2-abc: 0.1% of span at 10 volts/meter
<b>Operating Temperature Range</b>	-40°F to 167°F (-40°C to 75°C)
<b>Storage Temperature Range</b>	-60°F to 185°F (-51°C to 85°C)
<b>Calibration Adjustments</b>	Non-interactive, multi-turn span and zero potentiometers with approximately $\pm 10\%$ of span adjustment range
<b>Loss-of-air-Indication</b>	LED illuminates when input pressure falls below 60% of the live-zero input or, on optional alarm units, LED illuminates during alarm condition
<b>Mounting Position Effect</b>	None
<b>In-process Output Monitoring</b>	Current: For accurate reading, amp meter must have less than 20 $\Omega$ input resistance on 4-20 mA output (0.40 VDC drop)
<b>Connections</b>	Signal Air: 1/8" NPT female Electrical Wiring: Miniature terminal block accepts solid or stranded wire up to 14 AWG

## WIRING

The P290M is a “floating” transducer and consequently may tolerate a single ground anywhere in the 2-wire loop, with the single load placed anywhere as well. In most instances the loads should be placed in the negative leg, although it isn’t necessary. An earth ground can be placed on either end of the load, but you may prefer to have the negative terminal of the supply earthed as well. Refer to **Figure 1**.

### NOTE

**Care must be taken to ensure that the polarity of the input connections is correct regardless of where the loads or ground is placed. An inadvertent reversing of polarity will not damage the P290M, but it will not function until the wiring is corrected. In all instances, current flow enters at the positive terminal and exits the negative terminal.**

## CALIBRATION

All P290M transducers are fully calibrated at the factory to the output as ordered. It may be advisable to confirm that calibration was maintained during shipment for maximum accuracy. Easily accessible Span and Zero screws are located on the front panel. They are multi-turn potentiometers with slip clutches at the ends of travel that can provide  $\pm 20\%$  of span adjustability.

### NOTE

**Clockwise movement increases output on both potentiometers.**

Calibrate after the wiring has been completed and air pressure is connected. Place an amp meter across the test terminals located on the front plate or a volt meter across the load and monitor the load current against changes in signal pressure.

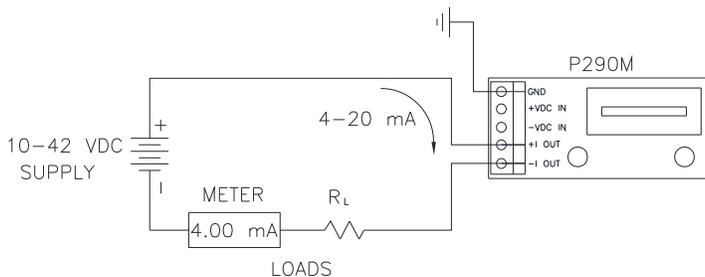
1. Apply minimum signal pressure and adjust the Zero screw until the output reads 4 mA.
2. Apply maximum signal pressure and adjust the Span screw until the output reads 20 mA.
3. Repeat steps 1 and 2 if necessary to stabilize output.

## TROUBLE SHOOTING

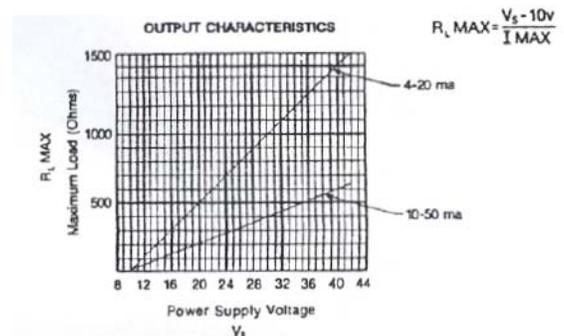
Should there be a problem with the P290M transducer, we recommend bench testing the unit away from the application. Connect a regulated air pressure and separate power supply to the unit and measure output with a meter to confirm that it is actually the transmitter at fault. If the problem can be duplicated, please contact the factory for repairs to be done under the terms of the warranty.

### NOTE

**There are no user serviceable parts inside and opening the P290M may void the warranty.**



**FIGURE 1**



## WARRANTY

ControlAir, Inc. products are warranted to be free from defects in materials and workmanship for a period of eighteen months from the date of sale, provided said products are used according to ControlAir, Inc. recommended usages. ControlAir, Inc.'s liability is limited to the repair, purchase price refund, or replacement in kind, at ControlAir, Inc.'s sole option, of any products proved defective. ControlAir, Inc. reserves the right to discontinue manufacture of any products or change products materials, designs or specifications without notice. Note: ControlAir does not assume responsibility for the selection, use, or maintenance of any product. Responsibility for the proper selection, use, and maintenance of any ControlAir product remains solely with the purchaser and end user.

### WARNING

**These products are intended for use in industrial compressed-air systems only. Do not use these products where pressures and temperatures can exceed those listed under Specifications.**

**Before using these products with fluids other than air, for non-industrial applications, life-support systems, or other applications not within published specifications, consult ControlAir, Inc.**

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