

# Pneumatic Pressure Transducer

## Model PR-242



The PR-242 converts pneumatic control signal into a precise analog output (0-1, 0-5, or 0-10 VDC or 4-20 mA). Unlike other units which have the sensing element directly mounted to the PC board, our PR-242 incorporates a unique manifold to isolate and float the sensor assembly from the hose connection to ensure that during installation the sensor is not exposed to unnecessary stress and distortion which may cause a calibration shift. In this way the output of any receiver-controller or EP transducer may be measured to provide feedback for controlling dampers and valve actuators. PR-242 can also be used to detect leaks in the branch line or to monitor the main air pressure.

- **100% solid state • Piezoresistive silicon sensing element •**
- **Rugged manifold assembly • Two year warranty •**
- **Available in more than seven pressure ranges •**
- **More than four supply voltage and five output options •**
- **Direct or reverse output option • Guaranteed compatible to all systems •**
- **Precision output clipping option • Electronic averaging/snubbing option •**
- **Two unique enclosure and port options for ease of installation •**



**MAMAC SYSTEMS**<sup>®</sup>  
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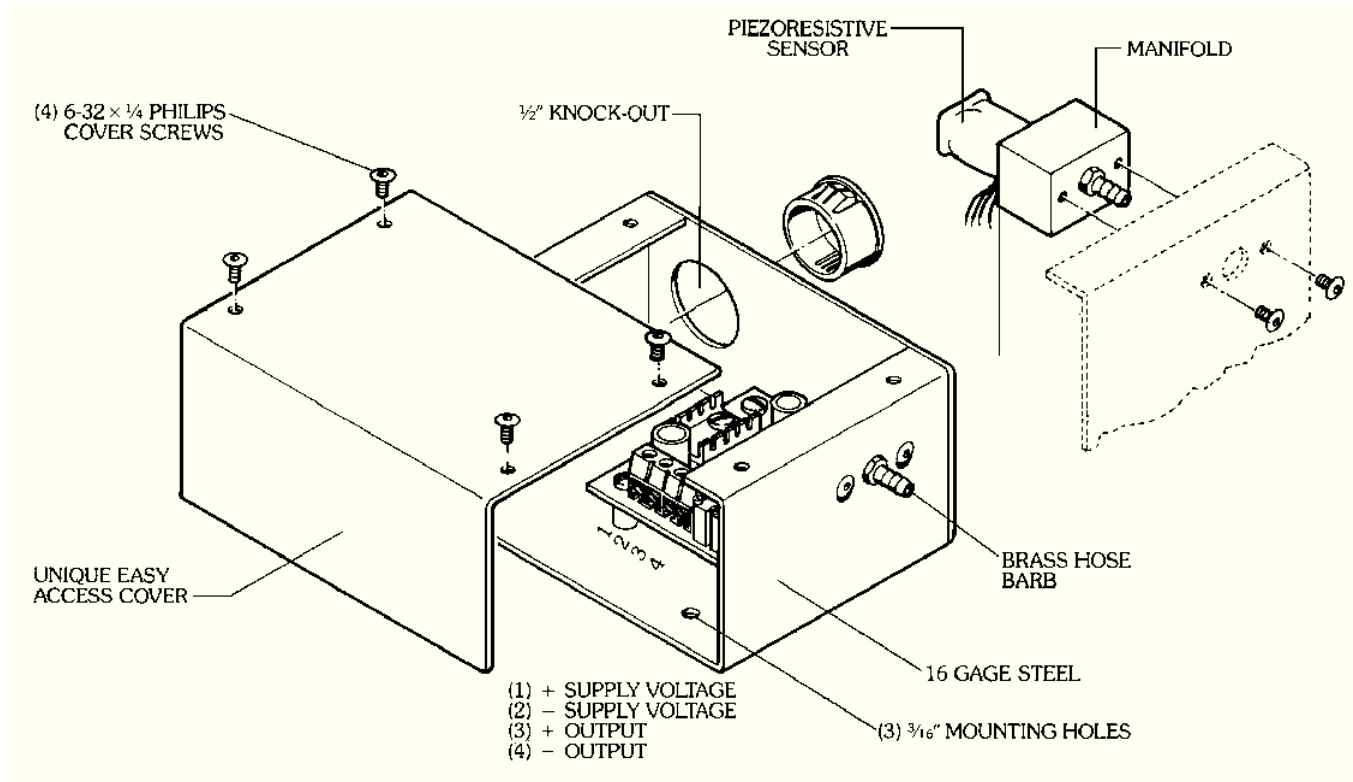
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The PR-242 sensing element is a 100% solid state piezoresistive silicon chip featuring low hysteresis, excellent repeatability, and long term stability. The chip is connected as a four-active-element bridge circuit for optimum linearity and sensitivity. Signal conditioning and temperature compensation are performed by industrial quality, state-of-the-art integrated circuits to provide an accurate, linear, and high level output that requires no additional signal conditioning.

MAMAC PR-242 also has "on card" regulation which enables it to accept nonregulated DC or AC power. MAMAC Systems has available a reliable PS-200 power supply and TR-201 power transformer at competitive pricing. We highly recommend using our power sources to eliminate any start up problem and to retain single source accountability for all peripherals. PR-242 is also available with a built-in isolation transformer. By specifying the 24 VAC with isolation supply voltage option, the unit may be powered with any existing 24-35 VAC transformer and the built-in transformer will isolate any ground loop faults, grounded secondary problems and will lower high AC secondary voltage to acceptable levels. If an existing 24 VAC power source is being used, we highly recommend specifying the 24 VAC with isolation supply voltage option.

The PR-242 is available with more than 7 pressure ranges including suction (vacuum), and compound ( $\pm 5$

or  $\pm 15$  psig). Our PR-242 is also available with any custom pressure range from - 15 to + 30 psig at no additional charge. Another feature available with the PR-242 is reverse output. With this option the output of the PR-242 decreases as the sensed pressure increases. This option is ideal to control pressure by interfacing with variable frequency drives or inlet vane damper actuators.

The PR-242 incorporates a rugged manifold assembly to isolate and "float" the pressure sensing element. By isolating the element from the hose connection we can ensure that during installation the sensor is not exposed to unnecessary stress, distortion or "twisting action." As a result, we can ensure that the calibration accuracy is not affected during the installation process.

In some applications, the pressure being measured may have rapid fluctuations which will cause the output of the measuring device to fluctuate rapidly. This fluctuation may make it difficult to obtain an accurate pressure measurement. In order to address this problem, our PR-242 is available with optional electronic snubbing. With this option, the highs and lows of the output are stabilized over time and an average measurement is provided. The rate of snubbing can be adjusted by a trimmer from 0-10 seconds. In this way, after installation any fluctuations in the output can be removed by merely increasing the averaging time until the output is stable.

## PR-242

The majority of the control systems do not have input limiting capability. If the transducer's output exceeds the specified controller input range due to the transducer being over-ranged or a malfunction, some systems lock up. In other cases, the excess voltage/current may bleed over other inputs. This results in erroneous decisions, false alarms or total loss of control. To address this shortcoming, our PR-242 is available with a precision output clipping feature. With this option, the transducer's output is precisely clipped at 20.3 mA, 5.1 VDC or 10.2 VDC. This output limiting feature does not in any way interfere with the linearity, repeatability, sensitivity or accuracy of the transducer. It is merely a secondary watchdog circuit which initiates limiting the moment the transducer's output exceeds the specified range.

PR-242 is shipped fully calibrated and tested with minimum 24 hours burn-in to provide trouble free start

up. Easily accessible zero and span trimmers are provided if field calibration is needed. PR-242 is available in two unique steel packaging options: 1) 14 gage enclosure ideally suited for panel mounting; 2) fully enclosed, stand alone NEMA-1 enclosure. Both options are designed to facilitate installation and provide easily accessible wiring terminations. Industry standard 1/4 inch hose barb or 1/8 inch NPT female swivel brass fitting is available for PVC/copper tubing connection.

With more than 5 output and supply voltage options, 7 plus pressure ranges, 2 output types, electronic snubbing and precision output clipping options, 2 enclosure options and 2 port configurations, our PR-242 not only guarantees compatibility to all control systems but also is the most versatile, stable, accurate and reliable pneumatic pressure transducer available for HVAC control systems.

### SPECIFICATIONS:

<b>Accuracy:</b> ±1% <sup>⊠</sup>	<b>Maximum Pressure:</b> 40 psig	<b>Precision Output Clipping:</b> 20.3 mA/5.1 VDC/10.2 VDC
<b>Linearity:</b> ±0.1%	<b>Media:</b> Dry Air or inert gases	<b>Compensated Temperature Range:</b> 32°F-125°F
<b>Repeatability:</b> ±0.1%	<b>Enclosure:</b> 14/16 gage steel	<b>Port(s):</b> 1/4" Brass Hose Barb or 1/8" NPT
<b>Hysteresis:</b> ±0.1%	<b>Finish:</b> Painted Gray PMS2GR88B	<b>Max. Supply Voltage:</b> 24 VAC/28 VDC nonregulated
	<b>Output Averaging:</b> 0-10 seconds	<b>Mounting Orientation Error:</b> None (100% solid state)

⊠Includes Linearity, Repeatability, Hysteresis, Stability and Temp Compensation

### ORDERING INFORMATION: PR-242

OUTPUT	PRESSURE RANGE	SUPPLY VOLTAGE	OUTPUT TYPE	OUTPUT AVERAGING	OUTPUT CLIPPING	ENCLOSURE
1) 0-1VDC	4) 0-20 psig	A) 24VDC	1) Direct	1) With	A) With	P) Panel**
2) 0-5VDC	5) 0-30 psig	B) 24 VAC	2) Reverse	2) Without	B) Without	1/4" Barb
3) 0-10VDC†	6) 3-15 psig	C) 115VAC				E) Enclosure
4) 4-20mA	7) -5-+5psig	D) 12VDC				1/4" Barb
5) 4-20mA	8) -15-+15psig	E) Custom				K) Panel**
(2-wire loop)*	9) 0-15 in Hg§	F) 24 VAC				1/8"NPT
6) Custom	10) 0-30 in Hg§	w/isolation				L) Enclosure
	11) Custom					1/8" NPT

†Not available with 12VDC supply voltage.

\*Available with 24VDC supply only (operates from 12-28 VDC).

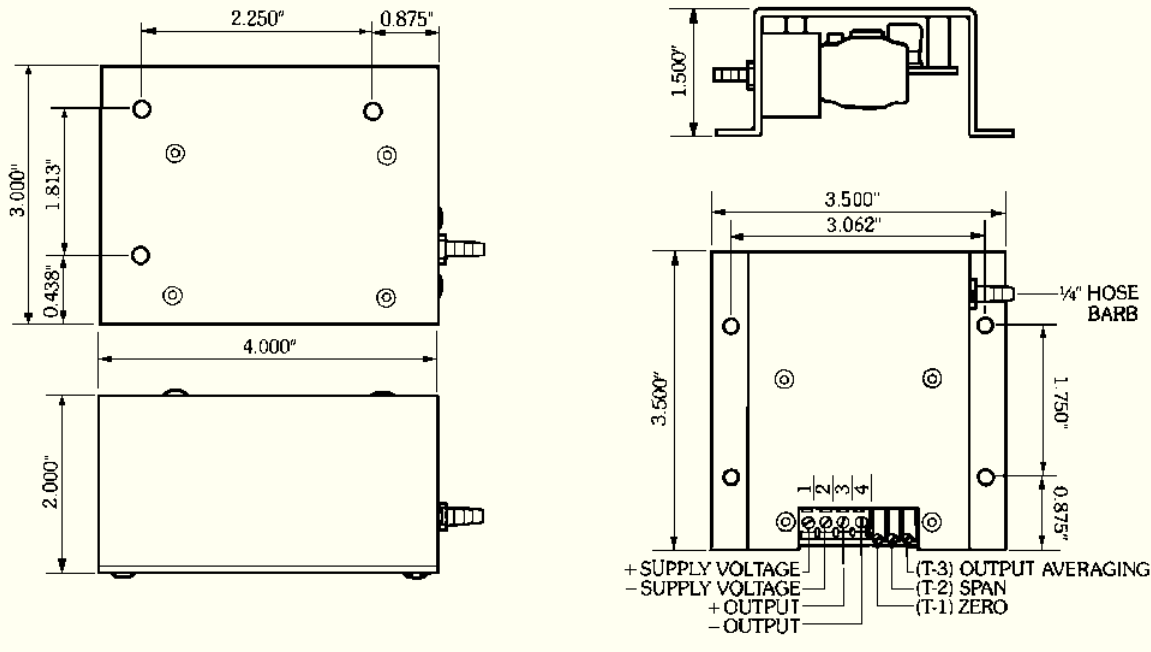
§Vacuum (suction).

\*\*For 115VAC Supply Voltage, Ext. TR-201 Transformer supplied.

The MAMAC Systems warranty covers parts and labor for 2 years from date of shipment.

MAMAC Systems reserves the right to change any specifications without notice to improve performance, reliability, or function of our products.

# PR-242



## CALIBRATION INSTRUCTIONS:

NOTE: All units are factory calibrated to meet or exceed published MAMAC specifications.

If field adjustment is needed, please perform the following steps:

- 1) Connect terminals 1 and 2 to appropriate power source.
- 2) For Output options 1-3 connect the plus lead of an accurate voltmeter to terminal #3 and for Output option 4 connect ampmeter plus lead to terminal #3. Connect common to terminal #4.
- 3) For Output type 5, connect an ampmeter in series to terminal (+) or (-).
- 4) Apply low pressure to the unit and carefully adjust the zero trimmer (T1) to obtain desired low output.
- 5) Apply high pressure to the unit and adjust span trimmer (T2) to obtain desired high output pressure.
- 6) Repeat steps 4 and 5 until no further correction is needed.

**OUTPUT AVERAGING OPTION:** Factory set at 0.0 seconds. Turn trimmer T3 clockwise to increase averaging time coefficient. Maximum averaging time available is 10 seconds. Usually 3.0 seconds (8 turns CW T3) is sufficient.

## A Complete Line of Control Peripherals From a Single Source

**MAMAC Systems** is the only manufacturer offering more than fifty products to satisfy all temp, humidity, pressure, flow, light, speed or any other DDC controls application. MAMAC's complete line of control peripherals is available in over two thousand different configurations of supply voltage, output, range and enclosure type to make our products guaranteed compatible to all HVAC controls, industrial automation and COGEN systems worldwide.

Single source accountability, liberal 2 year warranty, worldwide service and technical support, competitive pricing, accumulated experience of more than 10,000 installations are some of the benefits offered by MAMAC Systems which are second to none in the HVAC DDC controls industry.



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