

# Differential Pressure Sensor



Model PR-282

RoHS



- 100% solid-state fused silicon pressure sensors
- Rugged, leakproof 17-4 PH stainless steel monolithic pressure cavities with no welds, O-rings, seams, or bonds
- Wide 12-40 VDC/12-35 VAC unregulated supply voltage
- Three temperature-compensated humidity output versions: 4-20 mA 2-wire or 0-5 VDC/0-10 VDC
- NIST traceable calibration
- Rugged NEMA-1 (IP-30) enclosure
- Short circuit and reverse polarity protected
- Conforms to EMC and RoHS standards

The PR-282 incorporates sophisticated integrated circuits and new fused silicon monolithic cavity pressure sensors to not only provide a high level, fully conditioned and temperature compensated output, but also to offer up to six (6) pressure ranges. The 17-4 PH SS monolithic pressure cavity not only provides media compatibility for most of the applications, but also offers a leakproof solution for today's environmentally conscious customers. Three industry standard output versions are available: 4-20 mA 2-wire loop or 0-5 VDC/0-10 VDC. A wide 12-40 VDC or 12-35 VAC unregulated supply voltage and a broad 0°F–180°F compensated temperature range ensures compatibility to most of the applications. A rugged NEMA-1 (IP-30) enclosure, fully temperature compensated NIST traceable accuracy and a liberal five year warranty are some of the features which make the PR-282 the industry's most reliable, rugged, and economical pressure sensor.



8189 Century Boulevard • Minneapolis, MN 55317-8002 • USA  
800-843-5116 • 952-556-4900 • Fax 952-556-4997  
sales@mamacsys.com • www.mamacsys.com

4200 Waterside Centre  
Solihull Parkway  
Birmingham • West Midlands  
B37 7YN • United Kingdom  
01384-271113 • Fax 01384-271114

1 Fullerton Road #02-01  
One Fullerton  
Singapore • 049213  
65-31581826 • Fax 65-31581826

4 Armiger Court, Unit 2  
Adelaide • S.A.  
5088 • Australia  
08-8395-4333 • Fax 08-8395-4433

675 Cochrane Drive  
East Tower • 6th Floor  
Toronto • Ontario  
L3R 0B8 • Canada  
905-474-9215 • Fax 905-474-0876

## PR-282

The PR-282 sensing elements are 100% solid-state piezoresistive silicon strain gauge fused directly onto the 17-4 PH SS monolithic pressure cavity. The pressure cavity is machined out of a solid rod and does not incorporate any welds, seams, or bonds. In this way, the sensor not only offers excellent linearity, repeatability, and sensitivity, but also exhibits negligible hysteresis and withstands significant overpressure without zero shift. The monolithic nature of the cavity ensures not only leakproof operation but also enhances the overpressure and burst pressure specifications. The pressure cavity design incorporates novel techniques to isolate the fused silicon sensing element from installation related stress thereby ensuring zero integrity. The 17-4 PH SS offers excellent media compatibility to most of the industrial and commercial applications.

The PR-282 incorporates sophisticated integrated circuits to provide a high level, fully conditioned and temperature compensated output.

MAMAC PR-282 has unique "Double D" design stainless steel ports. The sensing elements are welded to the ports and both have stainless steel isolation between the sensor and media. In HVAC applications, thermal shock has always been a problem. A rapid change in temperature may cause epoxy seals to break and O-rings to blow out. The coefficient of thermal expansion of epoxy, neoprene and Buna-N is not the same as steel. A rapid temperature change will cause the ports and sensor to expand and the dissimilar coefficient of thermal expansion will result in the epoxy seals breaking and the O-rings loosening resulting in a leak. The PR-282 with welded construction and all stainless steel pressure cavities performs reliably under thermal shock conditions.

Another problem well known in our industry is that if a bulkhead fitting is used to secure the sensor to the enclosure, overtightening the fitting will result in the sensor twisting and the lead wires may break or the calibration may shift. To eliminate this problem, our engineers have incorporated a unique Double D design port which is

secured to the enclosure with two retaining E-rings. The Double D shape of the ports eliminates any possibility of the sensor twisting due to overtightening and the E-rings provide a rugged means to securely attach the sensing elements to the enclosure. The ports have wrench flats on each side to assist in tightening the pipe fitting to the ports.

The dual all stainless steel pressure cavities enable our PR-282 to be compatible to all media encountered in HVAC applications including freon, ammonia, steam, chilled/hot water, among others. This feature enables one unit to be compatible for all applications. On VDC output units, two options are available: outputs 0-5 or 0-10 VDC, and dual unregulated supply voltages 12-35 VAC or 12-40 VDC.

The mA output units can function over a wide unregulated supply voltage range of 12-40 VDC without any affect on calibration or performance. The unit has reverse polarity protection build in. As a result, it is next to impossible to damage the unit by mis-wiring. By using sophisticated low drop-out voltage regulators and CMOS integrated circuits, the mA output unit can drive very high output impedance. In fact, with only 12 VDC supply, the unit can drive 400 ohms. At 40 VDC, the unit is capable of handling up to 3000 ohms load. In this way, the output loop can be tied in series to multiple controllers, indicators and other devices without degrading the performance.

The PR-282 is shipped fully calibrated and tested with a minimum 24 hours burn-in to provide trouble free start up. Easily accessible zero and span trimmers are provided if field calibration is needed. The PR-282 has a unique 16 gage steel NEMA 1 enclosure designed to facilitate installation and provide easily accessible wiring termination. The pressure ports have industry standard 1/8-inch NPT process connection to accommodate any pipe fitting.

With more than 4 output and supply voltage options and 6 pressure ranges, our PR-282 not only guarantees compatibility to all control systems but also is the most reliable, stable and versatile differential pressure sensor available.

# PR-282

## SPECIFICATIONS:

**Accuracy\*:** ± 1% FS

**Overpressure:** 300% of rated range

**Burst Pressure:** 500% of rated range

**Max Static Pressure:** 200% of DP range

**Supply Voltage:** 12-40 VDC  
12-35VAC (VDC output units only)

**Supply Current:** VDC Units – 10 mA max.  
mA Units – 20 mA max.

**Load Impedance:** 3K ohms max. at 40 VDC  
(mA output units)  
1K ohms min.  
(VDC output units)

**Enclosure:** 16 gage steel - NEMA-1

**Finish:** Baked on Enamel-PMS2GR88B

*\*Includes non-linearity, hysteresis and non-repeatability*

U.S. PATENT NO. 6484587

**Compensated Temp Range:** 0°F–180°F  
(-18°C–82°C)

**T. C. Error:** ±0.025%/°F (.03%/°C)

**Media Compatibility:** Liquid/gases  
compatible to 316L  
stainless steel

**Port Connection:** 1/8" NPT

**Environmental:** 10 – 90%RH Non-Condensing

**Termination:** Unpluggable screw terminal block

**Wire Size:** 12 Ga max.

**Weight:** 1.7 lbs. (.75 kg)

## CONFORMANCE & TESTING:

**RoHS Compliant**

**EMC Testing:**

BS EN 55022:1998, BS EN 55024:1998,  
EN 61000-3-3, EN 61000-4-2,  
EN 61000-4-3, EN 61000-4-4,  
EN 61000-4-5, EN 61000-4-6,  
EN 61000-4-11

## ORDERING INFORMATION: PR-282

Output	Pressure Range	Supply Voltage	Output Type	Output Averaging	Output Clipping
1 0-1VDC	1 0-20 psid	A 24 VDC	1 Direct	2 Without	B Without
2 0-5VDC	2 0-30 psid	B 24 VAC			
3 0-10VDC	3 0-50 psid				
4 4-20mA*	4 0-100 psid				
	5 0-200 psid				
	6 0-300 psid				
	7 Custom**				

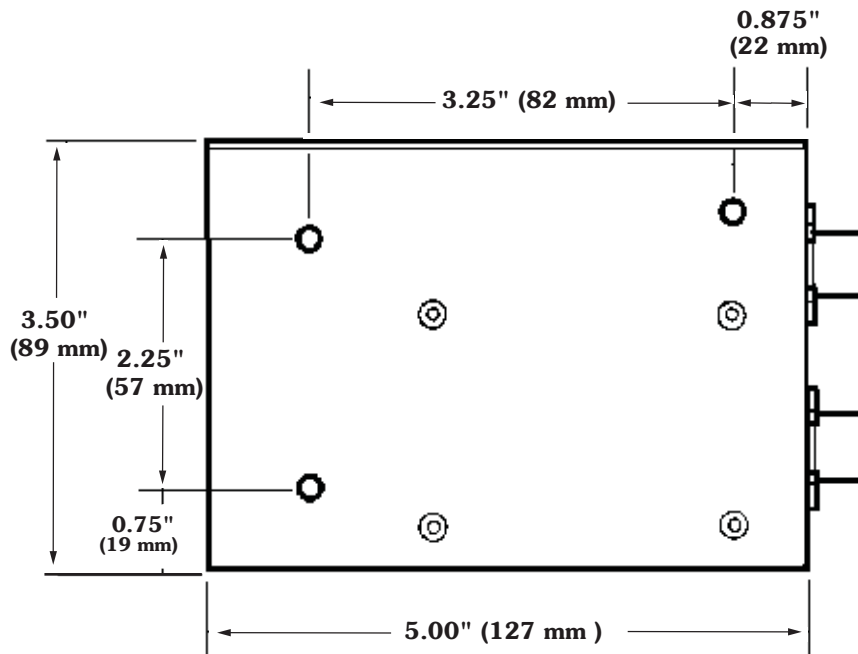
\*Available with 24VDC supply voltage only.

\*\*Custom ranges are available between 0-20 psid and 0-300 psid

**Example: PR-282-2-3-A-1-2-B:** 0-5 VDC Output with 0-50 psid Pressure Range and 24 VDC Supply Voltage

**Caution: Do not use on oxygen service, in explosive / hazardous environment or with flammable/combustible media.**

# PR-282



## PR-282



**MAMAC Systems is the leading global manufacturer of sensors, transducers, control peripherals and web browser based IP appliances. MAMAC products are used for HVAC and environmental controls, remote monitoring, alarming, energy metering and industrial automation.**

**All MAMAC products are manufactured in the USA.**

**WARRANTY:** MAMAC Systems, Inc. and its subsidiaries (hereinafter referred to as MAMAC Systems) warrants its products to be free of defects in material and workmanship for a period of five (5) years from date of shipment. If a unit is malfunctioning, it must be returned to the factory for evaluation. A return authorization number (RMA) will be issued by the customer service department and this number must be written or prominently displayed on the shipping boxes and all related documents. The defective part should be shipped freight pre-paid to the factory. Upon examination by MAMAC Systems, if the unit is found to be defective, it will be repaired or replaced at no charge to the customer. However, this warranty is void if the unit shows evidence of being tampered with, damaged during installation, misapplied, misused, or used in any other operating condition outside of the unit's published specifications.

**MAMAC Systems makes no other warranties or representations of any kind whatsoever, expressed or implied, except that of title. All implied warranties including any warranty of merchantability and fitness for a particular purpose are hereby disclaimed. User is responsible to determine suitability for intended use.**

**LIMITATIONS OF LIABILITY:** The remedies of buyer set forth herein are exclusive and the total liability of MAMAC Systems with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the product upon which liability is based. **In no event shall MAMAC Systems be liable for consequential, incidental or special damages.** MAMAC Systems reserves the right to change any specifications without notice to improve performance, reliability, or function of our products.

Every precaution for accuracy has been taken in the preparation of this manual, however, MAMAC Systems neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that result from the use of the product in accordance with the information contained in the manual.



8189 Century Boulevard • Minneapolis, MN 55317-8002 • USA  
800-843-5116 • 952-556-4900 • Fax 952-556-4997  
sales@mamacsys.com • www.mamacsys.com

4200 Waterside Centre  
Solihull Parkway  
Birmingham • West Midlands  
B37 7YN • United Kingdom  
01384-271113 • Fax 01384-271114

1 Fullerton Road #02-01  
One Fullerton  
Singapore • 049213  
65-31581826 • Fax 65-31581826

4 Armiger Court, Unit 2  
Adelaide • S.A.  
5088 • Australia  
08-8395-4333 • Fax 08-8395-4433

675 Cochrane Drive  
East Tower • 6th Floor  
Toronto • Ontario  
L3R 0B8 • Canada  
905-474-9215 • Fax 905-474-0876