



# Pressure Transducers Thin Film Technology

## DESCRIPTION

AMETEK thin film pressure transducers have a long and distinguished heritage for space applications. Long term reliability and stability have become the trademark of AMETEK's thin film technology pressure transducers. These pressure transducers have been in space for over twenty years on many satellite and spacecraft programs, demonstrating stability better than  $\pm 0.10\%$  of full scale output per year. AMETEK has pressure transducers mounted in a broad variety of applications – including manned and unmanned space vehicles, satellites, and interplanetary probes.

AMETEK's proprietary state-of-the-art technology is based on a sputter-deposited thin film, piezoresistive strain gage sensor bridge. With an applied excitation voltage, the fully-active, four-arm Wheatstone Bridge generates a differential voltage output proportional to the applied pressure. Temperature sensitive resistors are added to the bridge circuit to precisely calibrate the pressure sensor over its required operating temperature range.

The standard unamplified thin film pressure transducer operates with a 10 volt excitation and provides an output of 0 to 30 millivolts. The amplified thin film pressure transducer utilizes a discrete electronics package and level "S" EEE components to convert a 28 volt excitation and provide an isolated output signal of 0 to 5 volts. An EMI filter is incorporated to meet the requirements of MIL-STD-461.

The modular design of the AMETEK thin film transducers allows the mechanical pressure fitting and electrical interface to be constructed per specific customer requirements. AMETEK's thin film pressure transducers are the ideal choice when accuracy, high reliability, long term stability, and an exceptional heritage are requirements for the application.

## APPLICATIONS

- Space Shuttle
- Space Station
- Expendable Launch Vehicles
- Launch Vehicle Upper Stages
- Telecommunication Satellites
- Scientific Research Satellites
- Interplanetary Probes



## FEATURES

- ✓ High reliability and stability
- ✓ Wide operating temperature range, including cryogenic
- ✓ Customized configurations
- ✓ Rated for space environments
- ✓ Distinguished space heritage

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## SPECIFICATIONS

PERFORMANCE CHARACTERISTICS	MODEL PA/PG8224	MODEL PA4089
Pressure Range:	Ranges from 0 to 25 psi up to 0 to 10,000 psi	
Static Accuracy:	±0.25% of FS*	
Stability:	±0.1% of FS per year up to a lifetime maximum of ±1.0%	
Repeatability:	±0.1% of FS*	
Zero Balance:	±2% of FS*	
Thermal Zero Shift:	±0.005% FS/°F*	
Thermal Sensitivity:	±0.005% FS/°F*	
Proof Pressure: Rated Range ≤5000 psi Rated Range >5000 psi	200% of rated range 150% of rated range	
Burst Pressure:	300% of rated range	

ELECTRICAL CHARACTERISTICS	UNAMPLIFIED	AMPLIFIED WITH EMI FILTER
Excitation:	10 VDC	28 ± 4 VDC
Full Scale Output:	30 mVDC nominal	5 VDC
Insulation Resistance:	>100 MΩ at 50 VDC	
Input Impedance:	350 Ω - 6500 Ω (selectable)	NA
Output Impedance:	350 Ω - 6500 Ω (selectable)	100 Ω maximum
Turn-on Time:	Output ±0.2% of steady state value within 100 ms	
Response Time:	≤7 ms for 63% step input	

ENVIRONMENTAL CHARACTERISTICS		
Operating Temperature:	-320° to 460°F (-196° to 238°C)	-65° to 250°F (-54° to 121°C)
Compensated Temperature:	-320° to 460°F (-196° to 238°C)	-65° to 200°F (-54° to 93°C)
Shock:	6000 g pyroshock	2000 g pyroshock
Vibration:	>140 g <sub>rms</sub> random from 20 to 2000 Hz	>75 g <sub>rms</sub> random from 20 to 2000 Hz

PHYSICAL CHARACTERISTICS	
Pressure Fitting:	Threaded Fitting or Pressure Tube as Defined
Electrical Connection:	Connector or Cable as Defined
Documentation:	Customer Defined Acceptance Data Package and Supporting Documentation

\*Increased accuracy options available

Other performance, electrical, environmental, and physical options are available. Please contact the factory for assistance.

CONFIGURATION CHART		
DIM A	DIM B	DESCRIPTION
1.8 (46)	1.00 (25.4)	PA/PG8224
4.0 (102)	1.25 (31.8)	PA4089

.750 (19.05)  
ACROSS  
FLATS

A MAXIMUM

PRESSURE FITTING OR TUBE AS DEFINED BY CUSTOMER

ELECTRICAL RECEPTACLE OR CABLE AS DEFINED BY CUSTOMER

IN  
(MM)

DIMENSIONS

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