The Strength of Gems Psibar® Pressure Transducers
Starts with the Science of CVD

Gems Sensors provides the most stable pressure sensor on the market today by combining advanced sensing technology with highly automated and revolutionary manufacturing methods. The result is a sensing element comprised of silicon, stainless steel, glass, and other metals joined on a molecular level to form a pressure transducer that is impervious to aging. If your application requires long life components, Gems Psibar® transducers are designed with you in mind. Psibar® pressure transducers bring exceptional performance to a wide variety of applications across multiple industries. The strength of Psibar® pressure sensors starts with the science of CVD.

Psibar® transducers are manufactured using plasma-enhanced Chemical Vapor Deposition (CVD) technology. This sophisticated technique uses a chemical vapor to deposit thin layers of silicon and silicon dioxide on a stainless steel substratum to form a very sensitive and accurate polysilicon strain gauge. Since the elements of the strain gauge are fused together at the atomic level, the strength and integrity of the bond far exceeds the adhesives used in common pressure sensors. Psibar® transducers are inherently more stable and less sensitive to thermal exposure and pressure cycling than silicon-based pressure transducers. Your reward is a lower total cost of ownership.

All sensor conditioning, including amplification, temperature calibration and filtering is performed by our unique ASIC. It allows configurable output and pressures ranges, sets the zero and span tolerance and ensures interchangeability from unit to unit. The use of an ASIC eliminates laser trimming for temperature compensation, and unnecessary external components. Besides reducing size and complexity, the best reduction our ASIC accomplishes is in the price of a Psibar® transducer.

The CVD sensor and ASIC circuitry is complemented by all stainless steel construction delivering excellent media compatibility; all major components are joined by welding. This construction technique produces a highly stable pressure transducer that withstands harsh media, and is configurable to satisfy specific application requirements. Psibar® pressure transducers are produced in an automated, zero-defect manufacturing process that incorporates calibration, configuration and test systems to improve sensor accuracy and quality. Psibar® pressure transducers deliver exceptionally superior, long-term performance.

Advanced sensor manufacturing techniques allow Psibar sensors to deliver superior stability and long-life reliability.

Stainless steel Psibar wafers lie in a gas stream of plasma-enhanced gases. The PECVD process is used because it deposits high quality silicon at low temperature, which does not affect the state of the steel gauge. After deposition, the silicon is ion implanted to modify resistivity.

The thin film is atomically fused directly to the steel surface of the gauge beam and therefore follows the shape of the beam very accurately. This atomic fusion is the foundation for excellent performance and stability.

Cool, Laser Welded
The CVD strain gauge is affixed to the sensor assembly in a precise, automated laser weld process. A spot weld is made at each end and both sides of the beam to assure there is no twisting or tilting of the beam while a stitch weld is applied. Laser welding is fast and cool to prevent any distortion to the strain gauge.

Call Toll Free 800.378.1600
Psibar® CVD Advantages

- **Stability** – Very repeatable from day to day. Eliminate recalibration costs and reduce total cost of ownership.
- **Drift Free Performance** – ASIC makes external components or laser trimming unnecessary. Each parameter can be adjusted for optimal performance and configuration. ASIC requires fewer components which improves product quality and performance.
- **Robust Construction** – Automated manufacture improves the sensor’s consistency, quality and reliability while reducing production cost. Revolutionary manufacturing provides tighter control improving the sensor’s performance in harsh environments.
- **No Fill Fluids to Leak or Thin Diaphragm to Rupture**

Typical Applications

- Off Highway Vehicles – Load Weighing Systems and Load Moment Indicating
- Natural Gas Equipment – Compressors; Dispensing Equipment
- Semiconductor Processing – Wafer Manufacturing
- Power Plants – Piping Steam Pressures
- Refrigeration – Compressors and Lube Oil Pressure Equipment
- Robotics – Factory Automated Equipment
- HVAC – Compressors

Next...surround the CVD Sensor with a Superior Supporting Cast of Components

Along with the superiority of the CVD strain gauge, we add key components to leverage the sensing element’s strength. The output is a product with a unique balance of performance and value unmatched in today's pressure sensing market.

Modular Design Configurability without High Costs or Delays

Modular electrical and pressure connections, versatile pressure sensing cores, and modern cellular manufacturing enable us to deliver Psibar pressure sensors specifically suited to your application without a premium in cost or time. In fact, most orders ship within just 3 days!
Specifications

Input
- Pressure Range: Vacuum to 400 bar (6000 psi)
- Proof Pressure: 2x Full Scale (FS) – 2200/2600 Series
- Burst Pressure: >3.5x FS ± 6 bar (100 psi);
- Fatigue Life: >500 million FS cycles

Performance
- Long Term Drift: 0.2% FS/year (non-cumulative)
- Accuracy: 0.25% FS typical (optional 0.15% FS)
- Thermal Error: 1.5% FS typical (optional 1% FS)
- Compensated Temp.: -20 to 80°C (-5 to 180°F)
- Operating Temp.: -40 to 125°C (-22 to 260°F)

Pressure Port
- for electrical codes A, B, C, 1
- for electrical codes 2, D, G, 3
- for electrical codes F, M, P

Span Tolerance: ±1% of span
Zero Tolerance: ±1% of span

Mechanical Configuration – cont.
- IP65 for electrical codes B, G, C, 1, D, 3
- IP67 for electrical code “F”
- IP68 for electrical codes M, P (200 M Max.)
- IP30 for electrical code “3” with flying leads
- Vibration: 355 peak sinusoidal, 5 to 2000 Hz
- Acceleration: 100g steady acceleration in any direction
- 0.032% FS/g for 1 bar (35 psi) range
decreasing logarithmically to 0.0007% FS/g for 400 bar (6000 psi) range
- Shock: Withstands free fall to IEC 68-2-32 procedure 1

Approvals
- CE, , Intrinsically safe versions available.
- Meets requirements of EN50081-2 Emissions and EN50082-2 Susceptibility.
- Weight: Approx. 100 grams
- (additional; cable 75 g/m)

Individual Specifications
- Voltage Output units
  - Output: See ordering chart
  - Supply Voltage (Vs): 1.5 Vdc above span to 35 Vdc @ 6 mA
  - Supply Voltage Sensitivity: 0.01% FS/Volt
  - Min. Load Resistance: (FS output / 2) Kohms
- Current Output units
  - Output: 4-20 mA (2 wire)
  - Supply Voltage (Vs): 24 Vdc, (7-35 Vdc)
  - Supply Voltage Sensitivity: 0.01% FS/Volt
  - Max. Loop Resistance: (Vs-7) x 50 ohms
- Millivolt Output units (2200/2600 only)
  - Output: 100 mV +/-1 mV
  - Supply Voltage (Vs): 10 Vdc (15 Vdc max.) Regulated
  - Bridge resistance: 2600-6000 ohms

Psibar Part Number Structure

HOW TO ORDER
Use the Bold characters from the chart below to construct a product code

SELECT:
1. 2200, 2600, 1200, or 1600 series
2. Output: (1200 and 1600 are not available with “A” output)
   - A: 100 mV
   - B: 0-20 mA
   - C: 0-30 V
   - D: 0-15 V
   - E: 0-60 V
   - F: 0-50 V
   - G: 0-10 V
   - H: 0-4000 mV
   - I: VAC-0
   - J: VAC-1
   - K: VAC-2
   - L: VAC-3
   - M: VAC-4
   - N: VAC-5
3. Pressure Datum: G 6 gauge Absolute
4. Insert pressure range code from table below
   - Pressure Range – psi
     - F15 – 0-15
     - F20 – 0-20
     - F30 – 0-30
     - F50 – 0-60
     - F60 – 0-50
     - G10 – 0-100
     - G20 – 0-200
     - H10 – 0-100
     - H30 – 0-300
     - H60 – 0-600
     - H90 – 0-900
     - H100 – 0-1000
   - Pressure Range – bar (optional)
     - A10 – 0-1
     - A25 – 0-2.5
     - A40 – 0-4
     - A60 – 0-6
     - B10 – 0-10
     - B25 – 0-25
     - B40 – 0-40
     - B60 – 0-60
     - C10 – 0-100
     - C25 – 0-250
     - C40 – 0-400
     - C60 – 0-600
     - D10 – 0-100
     - D25 – 0-250
     - D40 – 0-400
     - D60 – 0-600
     - E10 – 0-100
     - E25 – 0-250
     - E40 – 0-400
     - E60 – 0-600
     - F10 – 0-100
     - F25 – 0-250
     - F40 – 0-400
     - F60 – 0-600
     - G10 – 0-100
     - G25 – 0-250
     - G40 – 0-400
     - G60 – 0-600
     - H10 – 0-100
     - H20 – 0-200
     - H30 – 0-300
     - H40 – 0-400
     - H60 – 0-600
     - H90 – 0-900
     - H100 – 0-1000
   - Pressure Range – bar (optional)
     - A10 – 0-1
     - A25 – 0-2.5
     - A40 – 0-4
     - A60 – 0-6
     - B10 – 0-10
     - B25 – 0-25
     - B40 – 0-40
     - B60 – 0-60
     - C10 – 0-100
     - C25 – 0-250
     - C40 – 0-400
     - C60 – 0-600
     - D10 – 0-100
     - D25 – 0-250
     - D40 – 0-400
     - D60 – 0-600
     - E10 – 0-100
     - E25 – 0-250
     - E40 – 0-400
     - E60 – 0-600
     - F10 – 0-100
     - F25 – 0-250
     - F40 – 0-400
     - F60 – 0-600
     - G10 – 0-100
     - G25 – 0-250
     - G40 – 0-400
     - G60 – 0-600
     - H10 – 0-100
     - H20 – 0-200
     - H30 – 0-300
     - H40 – 0-400
     - H60 – 0-600
     - H90 – 0-900
     - H100 – 0-1000

5. Pressure Port (for additional ports see chart or contact sales)
   - 02 1/4 NPT Male
   - 04 1/8 NPT Male
   - 06 3/8 Male
   - 08 1/4 Male
   - 12 Male
   - 16 Male
   - 20 Male
   - 24 Male
   - 30 Male
   - 36 Male
   - 40 Male
   - 48 Male
   - 54 Male
   - 60 Male
   - 66 Male
   - 72 Male
   - 80 Male
   - 84 Male
   - 96 Male
   - 100 Male
   - 112 Male
   - 125 Male
   - 144 Male
   - 160 Male
   - 175 Male
   - 192 Male
   - 208 Male
   - 225 Male
   - 250 Male
   - 275 Male
   - 300 Male
   - 325 Male
   - 350 Male
   - 375 Male
   - 400 Male
   - 425 Male
   - 450 Male
   - 475 Male
   - 500 Male
   - 525 Male
   - 550 Male
   - 575 Male
   - 600 Male
   - 625 Male
   - 650 Male
   - 675 Male
   - 700 Male
   - 725 Male
   - 750 Male
   - 775 Male
   - 800 Male
   - 825 Male
   - 850 Male
   - 875 Male
   - 900 Male
   - 925 Male
   - 950 Male
   - 975 Male

6. Electrical Connection
   - 2200/1200 series
     - A Mini DIN 9.4 mm w/mate
     - B Mini DIN 9.4 mm w/o mate
   - C Cable, NEMA 4, Plastic Cable Gland
   - F Cable, IP67, Metal Cable gland
   - 2600/1600 series
     - C 10-6 Bendix Twist Lock Plug
     - G Large DIN 34650A w/mate
     - M Submersible Cable, 5150 Meters
     - P Submersible Cable, 250 Meters
     - R 8-4 Bendix Twist Lock Plug
     - S 1/2” NPT Conduit w/cable

Gems Sensors Inc.
One Cowles Road
Plainville, CT
06062-1198
tel  860.747.3000
fax  860.747.4244
Call Toll Free 800.378.1600
Visit Us At: www.gemssensors.com

Specifications subject to change without notice.
© 2000 Copyright Gems Sensors Inc. All rights reserved
Printed in U.S.A. 10M Catalog No. 670