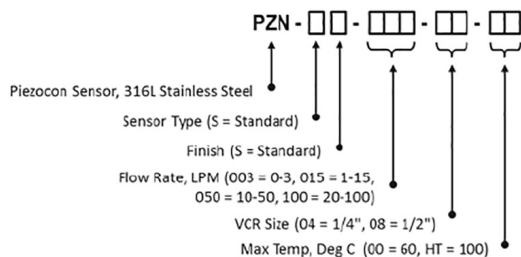


Standard Piezocon Gas Concentration Sensor

- Built using Veeco's industry-leading and production-proven Piezocon technology

Optimized for use in high-volume manufacturing (HVM) applications where operating temperature is less than 100 Deg C and operating pressure is greater than 250 Torr

- Ideal for high-volume CVD and MOCVD applications
- Operates in either monitor or control mode, providing real-time feedback and control of gas or vapor concentration and flux delivery



Specifications

	Standard Sensor
Range of Concentration (Binary Mixture Only)	0 - 100%
Maximum Operating Pressure	8,000 Torr
Minimum Operating Pressure	250 Torr
Range of Flow Rates	0 - 3 LPM; 1 - 15 LPM; 10 - 50 LPM; 20 - 100 LPM
Temperature Range (Sensor)	0 - 60 Deg C; 60 - 100 Deg C
Temperature Range (Controller)	0 - 40 Deg C
Pressure Connections	Male VCR: 1/4", 1/2"
Leakage to Atmosphere	< 1x10 ⁻⁹ atm cc/sec He
VCR Face-to-Face Dimension	124mm (4.88")
Weight (Sensor)	1.3 Kg (2.866 lbs)
Weight (Controller)	1-Channel Controller: 1.0 Kg (2.204 lbs) 4-Channel Controller: 2.8 KG (6.172 lbs)
Sensor Wetted Materials	316L Stainless Steel; Kapton; Inconel
Complete User Interface Software (Controller)	Monitor Status & Error Codes, Concentration, MFC Flow, Temperature
Communications Interface Options (Controller)	None; Devicenet; Profibus; RS-232; Modbus/TCP; Modbus/RTU; FabComms; Devicenet Master
Power Supply Options (Controller)	100 - 240 VAC, 50 - 60 Hz, 30 VA (internal); 24VDC External (3-wire interface provided for user to connect to their own external 24VDC power); 5VDC External (Veeco provides external 5VDC power supply)

Typical Measurements for Standard Sensors

Precursor Chemical	Typical Process	Concentration % Qp/Qtotal *	Accuracy % Qp/Qtotal *	Repeatability % Qp/Qtotal *	Matching %
Diborane, B ₂ H ₆	EPI	1	0.0285	0.0038	0.0228
Germane, GeH ₄	EPI	1	0.0111	0.0015	0.0090
Phosphine PH ₃	EPI	1	0.0239	0.0032	0.0192
Trichlorosilane, TCS (@ 18C, 30 psia)	EPI	1	0.0066	0.0009	0.0054

Example precursors in H₂ carrier gas, 1,000 Torr, 25C [except as noted above]

* Qp = Precursor Volumetric Flow, Qtotal = Total Volumetric Flow

Piezocon Gas Concentration Sensor and Delivery Control System

The Industry Standard for Reproducible Vapor Delivery Control

- The only gas concentration sensor to enable both monitoring and control of mass transfer of the precursor in real time
- Optimized for High Volume Manufacturing, with little to no user intervention and no periodic maintenance or calibration required
- Provides improved process reproducibility and increased yield by tightly controlling the delivery of process gases and precursor chemical vapors
- Lowers cost-of-operation by allowing more efficient use of precursor chemicals, extending the use of precursor sources and reducing waste
- Easier tool-to-tool matching with quantitative information directly meaningful to both equipment and process engineers
- Comprehensive diagnostic capabilities enable higher tool productivity
- Available options cover a broad range of operating pressures, temperatures and flow rates
- IECEX and CE certifications