Entegris

INVUE™ NX148 CONCENTRATION MONITOR

Process monitoring for in-line liquid chemical applications in a compact, integrated package

Overview

Entegris' InVue™ NX148 concentration monitor and 148-connect software package deliver real-time information for point-of-use chemical blending, spiking and dilution without process intrusion or interruption. The PC-based graphical user interface provides easy setup, field calibration, data collection and analysis.

Integrated in a compact, ultra-high purity package, the NX148 concentration monitor delivers cost-effective yet high-performance concentration monitoring enabling greater process efficiency for BEOL, FEOL and sub-fab delivery chemical systems. This increased window of visibility equates to tight process control increasing wafer throughout, reducing chemical costs and decreasing scrap.

The NX148 allows users to:

- Precisely monitor and control chemical dilution and blending in real-time
- Increase chemical bath lifetime, reducing chemical usage and disposal costs
- Monitor for chemical excursions
- Have access to real-time data for optimizing a process
- Replace alternative outdated or expensive monitoring technologies

Integration Flexibility

The NX148 utilizes an innovative refractive index technology packaged in a compact configuration. The measurement is based on the refraction of light in the process fluid, resulting in an accurate, safe

and repeatable means of measuring liquid concentration. The in-line sensor accurately measures the index of refraction and the temperature of the process fluid. This information is then used to calculate the process fluid's concentration. The NX148 includes three outputs, index of refraction, temperature and concentration via the interface cable. Outputs are 4 to 20 mA and RS-485 signals that can be used as inputs to process controllers. The Modbus®-compliant architecture supports an RS-485 long distance communication interface for programmable logic controllers or factory host. It includes an RS-485-to-USB converter.

Configurations are available with Flaretek®, PrimeLock® and Pillar® connections.

Features and Benefits

Features	Benefits
Measurement based on Index of Refraction (IoR)	Superior accuracy and response times
	Large dynamic range
	Achieves accuracy more rapidly than alternate technologies
	Measures concentration accurately and repeatedly even with non-conductive fluids
Integrated, small footprint installed directly in line with the process chemicals	Method is non-invasive; in line means no interruption of process and no delay in measurement
	Easily integrated into new tools or existing tools
148-connect software, Digital Display Unit (DDU)	GUI and software simplify programming and use
	Software enable on-site calibration in minutes, reducing cost of ownership
	Provides real-time refractive index, concentration and temperature
	Supports RS-485 long distance communication as well as 4-20 mA
Sensor has no consumable parts	Fewer replacement parts means minimal hardware maintenance

Specifications

Sensor materials of construction:	Flow cell	Teflon® (modified PTFE)*
	Optical window	Semiconductor-grade sapphire*
	Cable	Polyphenylene sulfide (PPS)
	Bonnet, enclosure	Polypropylene (PP)
	Mounting plate	PVDF
Sensor operating parameters:	Fluid pressure rating	0 – 5.5 bar (0 – 80 psig)
	Fluid temperature rating	5°C – 50°C (41°F – 122°F)
	Process fluid index of refraction range	1.28000 to 1.40000**
Machine interface:	4 – 20 mA RS-485 (Modbus-compliant)	Analog, scalable resolution
		Digital over serial***
Software:	Windows®-based interface for user setup, calibration, monitoring and data logging System requirements: Windows 98 or higher, 128+MB RAM, CD-ROM	

**Wetted components.*

***For fluids with an RI above 1.40000, please consult your local Entegris support person.*

****Full digital protocol available to replicate service software 148-connect.*

Performance Data

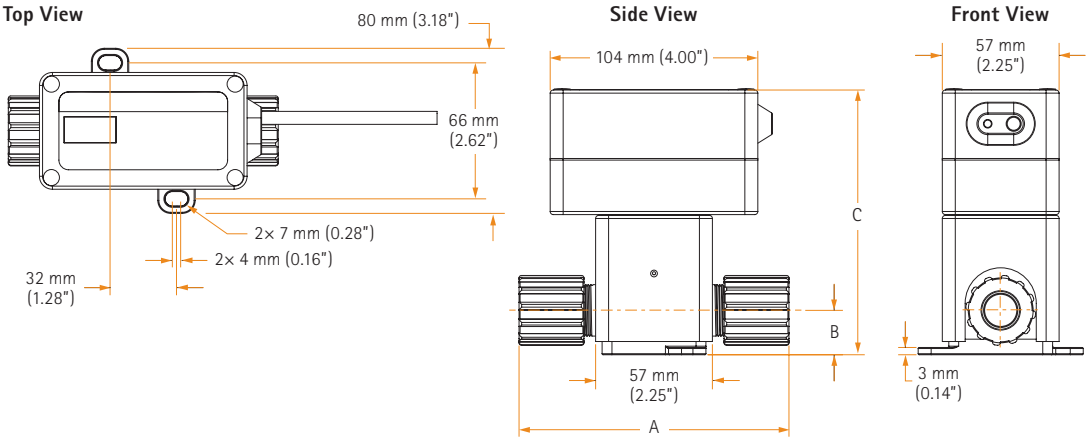
The following performance data is based on operation within the calibrated range, ±0.3% of the refractive index calibration point or ±0.3% of concentration.*

Criteria	Value
Refractive index accuracy (Refractive Index Units, RIU):	$\pm 2 \times 10^{-4}$
Refractive index repeatability:	2.5×10^{-5}
Refractive index resolution:	1.0×10^{-5}
Concentration accuracy:	±0.2 wt%**
Concentration repeatability:	±0.025 wt%
Concentration resolution:	Chemical dependent 0.01 wt% or better
Response time:	1.2 sec standard, no rolling averaging enabled, rolling averaging is user-configurable

**The fluid temperature compensation coefficient (TCC) is shipped factory set using room temperature DI water.*

***Based on measuring ethylene glycol at 0.345 bar (5 psig) with a maximum variation of 0.017 bar (±0.25 psig) and a temperature of 20°C ±0.1°C (68°F ±0.18°F).*

Dimensions

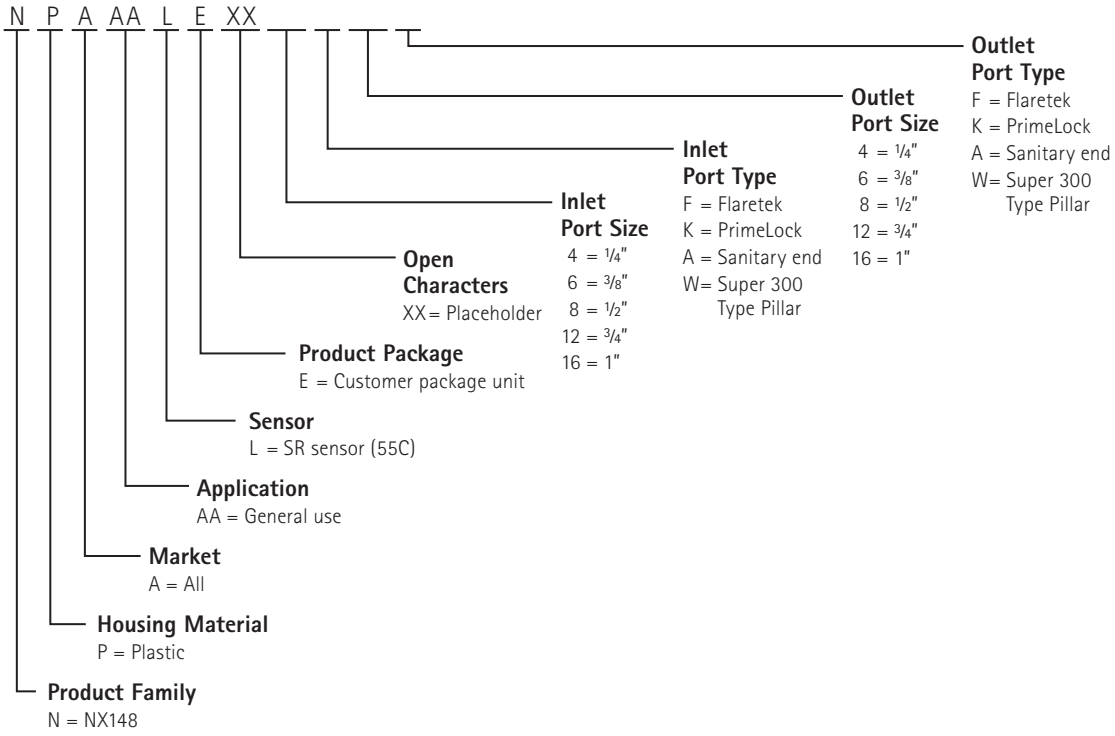


	Dimensions		
Port Connection	**A**	**B**	**C**
1/4" Flaretek	113.3 mm (4.46")	21.6 mm (0.85")	123.2 mm (4.85")
1/4" Pillar S300	96.5 mm (3.80")	21.6 mm (0.85")	123.2 mm (4.85")
1/4" PrimeLock	107.2 mm (4.22")	21.6 mm (0.85")	123.2 mm (4.85")
3/8" Flaretek	118.9 mm (4.68")	20.1 mm (0.79")	123.2 mm (4.85")
3/8" Pillar S300	108.2 mm (4.26")	21.3 mm (0.84")	124.5 mm (4.90")
3/8" PrimeLock	110.7 mm (4.36")	21.3 mm (0.84")	124.5 mm (4.90")
1/2" Flaretek	122.9 mm (4.84")	19.8 mm (0.78")	124.5 mm (4.90")
1/2" Pillar S300	114.3 mm (4.50")	24.9 mm (0.98")	129.5 mm (5.10")
1/2" PrimeLock	118.4 mm (4.66")	24.9 mm (0.98")	129.5 mm (5.10")
3/4" Flaretek	132.1 mm (5.20")	21.8 mm (0.86")	129.5 mm (5.10")
3/4" Pillar S300	130.3 mm (5.13")	29.5 mm (1.16")	137.2 mm (5.40")
3/4" PrimeLock	133.1 mm (5.24")	29.5 mm (1.16")	137.2 mm (5.40")
1" Flaretek	144.3 mm (5.68")	26.2 mm (1.03")	137.2 mm (5.40")
1" Pillar S300	144.5 mm (5.69")	32.5 mm (1.28")	143.5. mm (5.65")
1" PrimeLock	143.8 mm (5.66")	32.5 mm (1.28")	143.5. mm (5.65")

Ordering Information

InVue NX148 Concentration Monitor

Part Number



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