NOVA SENSOR

# NPI-15VC Series

## Voltage Compensated, Media Isolated, High Pressure Sensors

### Applications

- Process control systems
- Hydraulic systems and valves
- Automobiles and trucks
- Biomedical instruments
- Refrigeration and HVAC controls
- Appliances and consumer electronics
- Ship and marine systems
- Aircraft and avionic systems

### Features

- Solid state, high reliability
- High sensitivity with 100 mV ± 1% FSO at 10 VDC
- 316L stainless steel, IsoSensor design
- Linearity 0.1% FSO typical
- Thermal accuracy 0.2% FSO typical
- Four standard ranges: 500, 1000, 3000, and 5000 psi (34.5, 69, 207, and 345 bar) available in absolute or sealed gage
- Standard configurations include:
  —1/2–20 UNF threaded male port with 1.0 in (24.4 mm) flange
  —0.59 in (14.98 mm) diameter x 0.87 in (22.09 mm) long cylinder with o-ring seals
  —1/4–18 NPT male port with 7/8 in flange
  —1/8–27 NPT male port with 7/8 in flange
- Custom configurations and other pressure ranges available. Please consult factory

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# NPI-15VC Series Specifications

## Description

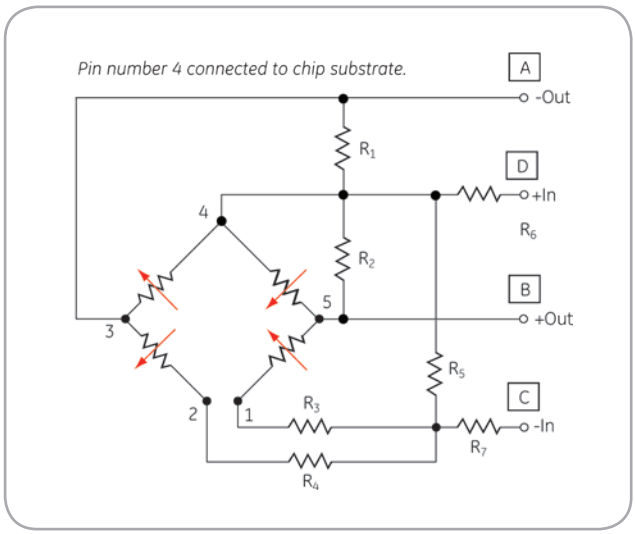
The NovaSensor voltage compensated NPI-15VC Series offers the performance of our current compensated sensors with the convenience of using a voltage supply. Voltage compensation allows the sensor to be connected directly to the power supply, thereby eliminating the need for additional components to construct a constant current source. These sensors enable field interchangeability with a calibrated FSO of 100 mV ±1 %.

As with all NPI media isolated sensors, they are designed to operate in hostile environments and yet give the outstanding sensitivity, linearity, and hysteresis of a silicon sensor. The piezoresistive sensor chip is housed in a fluid-filled cylindrical cavity and isolated from the measured media by a stainless steel diaphragm and body. The NPI Series employs SenStable® processing technology, providing excellent output stability.

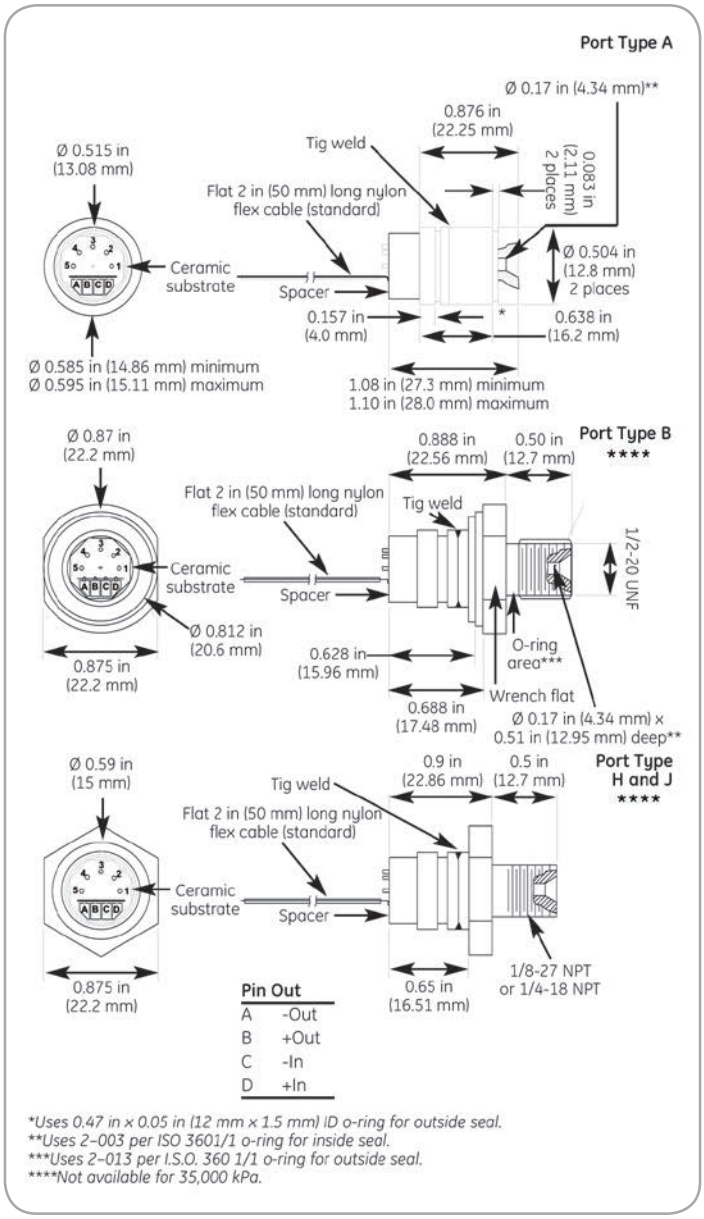
The modular design allows for a variety of pressure port modules which are hermetically welded to the sensor head module.  Standard types A, B, H, and J are shown to the right.

For compensation of temperature effects, a resistor network is supplied on a hybrid ceramic substrate. The

IsoSensor design minimizes temperature errors to provide a maximum offset error of 1.0% FSO and a maximum full scale output error of 0.75% FSO over the
32°F to 158°F (0°C to 70°C) compensated range.




*NPI-15VC Series schematic diagram*




*NPI-15VC Series dimensions*

# NPI-15VC Series Specifications

| Parameter | Value | Units | Notes |
|---|---|---|---|
| **General** | | | |
| Pressure Range | 0 to 500 | psi | 3,447 kPa |
| | 0 to 1,000 | psi | 6,894 kPa |
| | 0 to 3,000 | psi | 20,682 kPa |
| | 0 to 5,000 | psi | 34,470 kPa |
| Maximum Pressure | 2 x | | rated pressure |
| **Electrical** @ 77°F (25°C) unless otherwise stated | | | |
| Input Excitation | 10 | VDC | 15 VDC maximum |
| Insulation Resistance | 100M | Ω | @ 50 VDC Input |
| Impedance (minimum) | 4,000 | Ω | |
| Output Impedance | 5,000 | Ω | ± 20% |
| Bridge Impedance | 5,000 | Ω | ± 20% |
| **Environmental** | | | |
| Temperature Range | | | |
| Operating [9] | –40 to 257°F | | (–40°C to 125°C) |
| Compensated Range | 32 to 158°F | | (0°C to 70°C) |
| Vibration | 10 | gRMS | 20 to 2000Hz |
| Shock | 100 | g | 11 milliseconds |
| Life (Dynamic Pressure Cycle) | 10 x $10^6$ cycles | | |
| **Mechanical** [1] | | | |
| Weight | 0.06 | lb | (28 g) NPI–15A–XXX |
| | 0.10 | lb | (47 g) NPI–15B/H/J–XXX |
| Media Compatibility | All corrosive media compatible with 316L stainless steel | | |
| Case and Diaphragm Material | 316L stainless steel | | |
| Recommended O-Ring | Type A: 0.472 in (12 mm) ID x 0.059 in (1.5 mm) wall | | |
| | Type B: 2-013 per ISO 3601/1 | | |

| Parameter | Units | Min. | Typical | Max. | Notes |
|---|---|---|---|---|---|
| **Performance Parameters** 500, 1,000, 3,000, & 35,000 psi (Note 1,8) | | | | | |
| Full Scale Output | mV | 99 | 100 | 101 | 2 |
| Linearity | %FSO | –0.35 | 0.1 | 0.35 | 3 |
| Hysteresis and Repeatability | %FSO | –0.05 | 0.01 | 0.05 | |
| Thermal Accuracy of Offset | %FSO | –1.0 | 0.2 | 1.0 | 4 |
| Thermal Accuracy of FSO | %FSO | –0.75 | –0.2 | 0.75 | 4 |
| Thermal Hysteresis | %FSO | –0.2 | ±0.1 | 0.2 | 5 |
| Short-Term Stability of Offset | µV/V | | 5 | | 6 |
| Short-Term Stability of FSO | µV/V | | 5 | | 6 |
| Long-Term Stability of Offset | %FSO | | 0.1 | | 7 |
| Long-Term Stability of FSO | %FSO | | 0.1 | | 7 |

## Warranty

NovaSensor warrants its products against defects in material and
workmanship for 12 months from the date of shipment . Products not subjected to misuse will be repaired or replaced. NovaSensor reserves the right to make changes without further notice to any products herein. NovaSensor makes no warranty, representation or guarantee regarding the suitability of its products for any particular application, nor does NovaSensor assume any liability arising out of the application or use of any product or circuit and specifically disclaims and all liability without limitation consequential or incidental damages. The foregoing warranties are exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. No Implied statutory warranty of merchantability or fitness for particular purpose shall apply.

## Ordering Information

**NPI-15**

| Code | Pressure Port Type |
|---|---|
| A | No port |
| B | 1/2-20 UNF |
| H | 1/4-18 NPT |
| J | 1/8-27 NPT |

| Code | Pressure Ranges in psi |
|---|---|
| 500 | 500 psi (3447 kPa) |
| 1KØ | 1000 psi (6894 kPa) |
| 3KØ | 3000 psi (20,632 kPa) NPI-15A only |
| 5KØ | 5000 psi (34,470 kPa) NPI-15A only |

| Code | Compensation |
|---|---|
| A | Absolute |
| S | Sealed gauge |

| Code | Voltage |
|---|---|
| V | Constant Voltage Excitation |

**NPI-15** — - — - — - — **Typical model number**

1. Performance with offset , thermal accuracy of offset and thermal accuracy of FSO compensation resistors.
2. FSO with 10 VDC.
3. Linearity by best fit straight line.
4. 32°F to 158°F (0°C to 70°C) with reference to 77°F (25°C).
5. 32°F to 158°F (0°C to 70°C), by design.
6. Normalized offset/bridge voltage_100 hours, typical value, not tested in production.
7. One year, typical value, not tested in production
8. All values measured at 77°F (25°C) and at 10 VDC, unless otherwise noted.
9. Reduced performance outside compensation range, not tested in production.

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