

# GE Sensing

## Features

- Solid state, high reliability
- High sensitivity, 200 mV typical FSO with 1.0 mA excitation
- 316 L stainless steel, IsoSensor design
- Linearity 0.1% FSO typical
- Three standard ranges: 0 psi to 500 psi to 0 psi to 5,000 psi (0 bar to 34 bar to 0 bar to 345 bar) available, sealed gage or absolute
- Standard configurations include:
  - 1/2–20 UNF threaded male port with 1.0 in (25.40 mm) flange
  - 0.59 in (15 mm) diameter x 0.87 in (22 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

- Thermal accuracy FSO 0.2% typical
- Custom Configurations and Other Pressure Ranges can be accommodated

## 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

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# NPI-15 Series

## NovaSensor Current Driven, Media Isolated, High Pressure Sensors

NPI-15 Series is a NovaSensor product. NovaSensor has joined other GE high-technology sensing businesses under a new name—GE Industrial, Sensing.



# NPI-15 Series Specifications

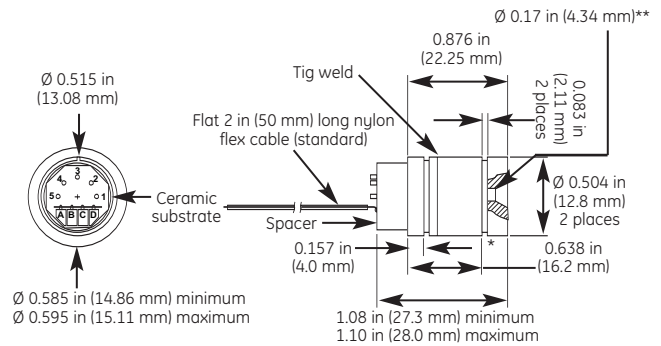
## Description

The NovaSensor NPI-15 Series incorporates state-of-the-art IsoSensor technology, which gives the OEM user the best in price and performance. 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. As with all NovaSensor silicon sensors, the NPI-15 Series employs SenStable® processing technology, providing excellent stability.

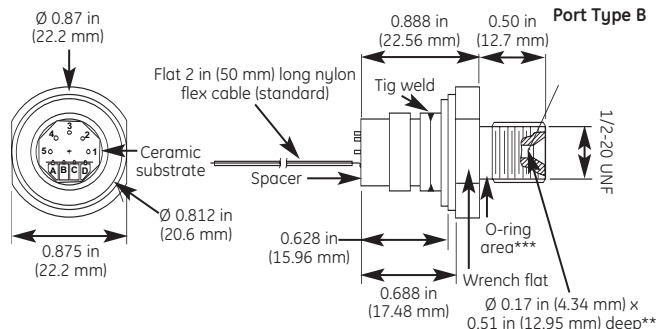
The modular design allows for a variety of pressure port modules which are hermetically welded to the sensor header module. Standard types A, B, H and J are shown to the right.

For compensation of temperature effects, a complete resistor network is supplied on a hybrid ceramic substrate. The IsoSensor design minimizes temperature errors to provide a maximum offset errors of 0.75% FSO over the 32°F to 158°F (0°C to 70°C) compensated range.

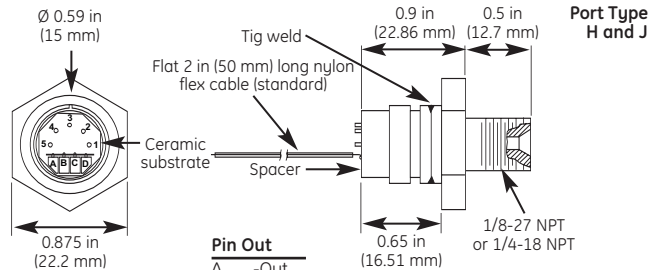
Port Type A



Port Type B



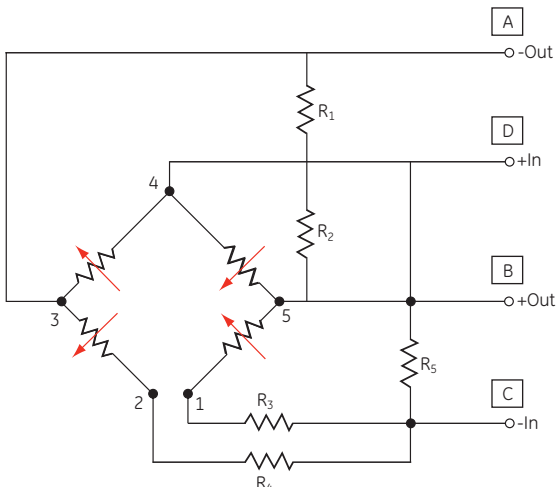
Port Type H and J



| Pin Out |      |
|---------|------|
| A       | -Out |
| B       | +Out |
| C       | -In  |
| D       | +In  |

\*Uses 0.47 in x 0.05 in (12 mm x 1.5 mm) ID o-ring for outside seal.  
 \*\*Uses 2-003 per ISO 3601/1 o-ring for inside seal.  
 \*\*\*Uses 2-013 per I.S.O. 360 1/1 o-ring for outside seal.  
 \*\*\*\*Not available for 35,000 kPa.

NPI-15 Series dimensions



NPI-15 Series schematic diagram

# NPI-15 Series Specifications

| Parameter   | Value  | Units          | Notes                             |      |
|---|--|----------------|-----------------------------------|------|
| <b>General</b>  |  |                |                                   |      |
| Pressure Range  | 3500   | kPA            | 507 psi                           |      |
|   | 7000   | kPA            | 1015 psi                          |      |
|   | 35,000   | kPA            | 5,076 psi                         |      |
| Maximum Pressure  | 2 x  |                | rated pressure                    |      |
| <b>Electrical @ 77°F (25°C) unless otherwise stated</b> |  |                |                                   |      |
| Input Excitation  | 1.0  | mA             | 1.5 mA maximum                    |      |
| Insulation Resistance                                   | 10 <sup>(8)</sup>  | Ω              | @ 50 VDC                          |      |
| Input Impedance   | 4,000  | Ω              | ±20%                              |      |
| Output Impedance  | 5,000  | Ω              | ±20%                              |      |
| Bridge Impedance  | 5,000  | Ω              | ±20%                              |      |
| <b>Environmental</b>                                    |  |                |                                   |      |
| Temperature Range                                       |  |                |                                   |      |
| Operating <sup>(9)</sup><br>Compensated                 | -40 to 257   | °F             | (-40°C to 125°C)                  |      |
|   | 32 to 158  | °F             | (0°C to 70°C)                     |      |
| Vibration   | 10   | gRMS           | 20 to 2000Hz                      |      |
| Shock   | 100  | g              | 11 milliseconds                   |      |
| Life (Dynamic Pressure<br>Cycle)                        | 10 x 10 <sup>(6)</sup>   | cycles         | 500/1000 psi<br>(34.47/68.94 bar) |      |
|   | 1 x 10 <sup>(6)</sup>  | cycles         | 5000 psi<br>(344.73 bar)          |      |
| <b>Mechanical<sup>(1)</sup></b>                         |  |                |                                   |      |
| Weight  | ≈28  | g              | NPI-15A-XXX                       |      |
|   | ≈47  | g              | NPI-15B-XXX                       |      |
| Media Compatibility                                     | All corrosive media compatible with 316 stainless steel                              |                |                                   |      |
| Case and Diaphragm                                      | 316 L stainless steel  |                |                                   |      |
| Material  |  |                |                                   |      |
| Recommended O-Ring                                      | Type A: 0.472 in (12 mm) ID x 0.059 in (1.5 mm) wall<br>Type B: 2-013 per ISO 3601/1 |                |                                   |      |
| <b>Parameter Units Minimum Typical Maximum Notes</b>    |  |                |                                   |      |
| Performance   | 3,500, 7,000 & 35,000 kPa  | (Note 1 and 8) |                                   |      |
| Offset  | mV   | -2             | 1                                 | 2    |
| Full Scale Output                                       | mV   | 170            | 200                               | 230  |
| Linearity   | %FSO   | -0.25          | 0.1                               | 0.25 |
| Hysteresis and<br>Repeatability                         | %FSO   | -0.05          | 0.01                              | 0.05 |
| Thermal Accuracy of<br>Offset                           | %FSO   | -0.75          | 0.2                               | 0.75 |
| Thermal Accuracy of<br>FSO                              | %FSO   | -0.75          | 0.2                               | 0.75 |
| Thermal Hysteresis                                      | %FSO   | -0.2           | 0.1                               | 0.2  |
| Short-Term Stability of<br>Offset                       | μV/V   | 5              |                                   | 6    |
| Short-Term Stability of<br>FSO                          | μV/V   | 5              |                                   | 6    |
| Long-Term Stability of<br>Offset                        | %FSO   | 0.1            |                                   | 7    |
| Long-Term Stability of<br>FSO                           | %FSO   | 0.1            |                                   | 7    |

- Performance with offset, thermal accuracy of offset and thermal accuracy of FSO compensation resistors.
- FSO with 1.0 mA input excitation.
- Linearity by best fit straight line.
- 32°F to 158°F (0°C to 70°C) with reference to 77°F (25°C).
- 32°F to 158°F (0°C to 70°C) by design.
- Normalized offset/ bridge voltage—100 hours, typical value, not tested in production.
- One year, typical value, not tested in production.
- All values measured at 77°F (25°C) and at 1.0 mA constant current, unless otherwise noted.
- Reduced performance outside compensation range.

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## Ordering Information

| NPI-15      |  |
|-------------|--|
| <b>Code</b> | <b>Pressure Port Type</b>                          |
| A           | No port (see note 7)                               |
| B           | 1/2-20 UNF (see note 7)                            |
| H           | 1/4-18 NPT (see note 7)                            |
| J           | 1/8-27 NPT (see note 7)                            |
| <b>Code</b> | <b>Pressure Ranges</b>                             |
|             | (kilo Pascals (kPa); 3rd digit is number of zeros) |
| 352         | 3500 kPa   |
| 702         | 7000 kPa   |
| 353         | 35,000 kPa   |
| <b>Code</b> | <b>Compensation</b>                                |
| A           | Absolute   |
| S           | Sealed gauge                                       |
| <b>Code</b> | <b>Current</b>                                     |
| H           | Constant current excitation                        |

NPI-15 - - - - - Typical model number

GE  
Sensing



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920-260A

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