

NPI-19 Series

Medium Pressure, Media Isolated Pressure Sensor

DESCRIPTION

The Lucas NovaSensor® NPI 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 measured media by a stainless steel diaphragm and body. As with all Lucas NovaSensor® silicon sensors, 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 header module. Standard types A, B, H, and J are shown inside.

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 full-scale offset error of 75 % FSO over the 0 to 70°C compensated range.



FEATURES

- Solid state, high reliability
- High sensitivity, 100mV FSO with 1.0mA excitation
- 316 stainless steel, wetted surfaces
- Linearity 0.1% FSO typical
- Thermal accuracy FSO 0.2% typical
- Four standard ranges: 0–15 to 0–250 psi available, gage or absolute
- Standard configurations include:
 - 1/2"–20 UNF threaded male port with 1.0" flange
 - 0.74" diameter x 0.28" long cylinder with o-ring seals
 - 1/4"–18 NPT male port with 7/8" flange
 - 1/8"–27 NPT male port with 7/8" flange
- Custom configurations and other pressure ranges available. Please consult factory

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

NPI Series Specifications

PARAMETER	VALUE	UNITS	NOTES
GENERAL			
Pressure Ranges	0-100	kPa	~0-15 psi
	0-200	kPa	~0-30 psi
	0-700	kPa	~0-100 psi
	0-1,700	kPa	~0-250 psi
Maximum Overpressure	2X		rated pressure
ELECTRICAL @ 25°C (77°F) unless otherwise stated			
Input Excitation	1.0	mA	1.5mA max.
Insulation Resistance	10 ⁸	Ω	@ 50 V _{DC}
Input Impedance	4,000	Ω	± 20%
Output Impedance	5,000	Ω	± 20%
Bridge Impedance	5,000	Ω	± 20%
ENVIRONMENTAL			
Temperature Range			
Operating ⁽⁹⁾	-40 to +125	°C	-40 to +257°F
---Compensation Range	0 to +70	°C	+32° to +158°F
Vibration	10	g _{RMS}	20 to 2000Hz
Shock	100	g	11 milliseconds
Life (Dynamic Pressure Cycle)	1 x 10 ⁶	cycles	
MECHANICAL			
Weight	~10 ~45	grams grams	NPI-19A-XXX NPI-19B/H/J-XXX
Media Compatibility	All corrosive media compatible with 316 stainless steel		
Case and Diaphragm Material	316 stainless steel		
Recommended O-Ring	Type A: 16.76 dia. X 0.99 (0.66 x 0.039) Type B: 2-013 per ISO 3601/1		

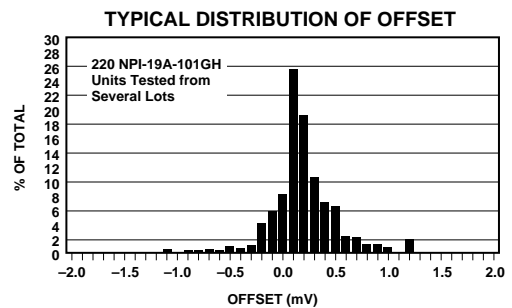
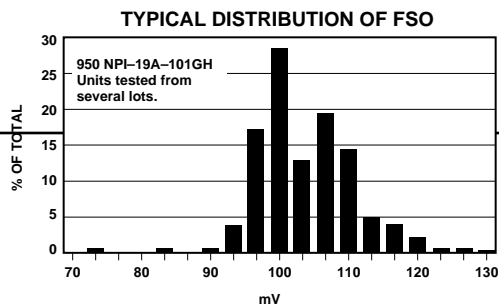
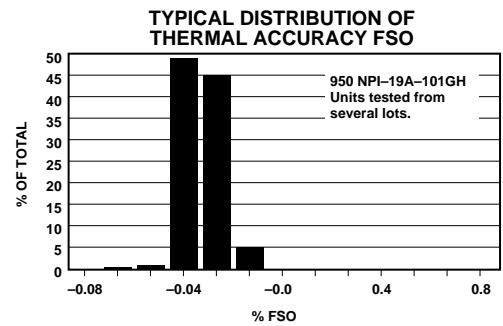
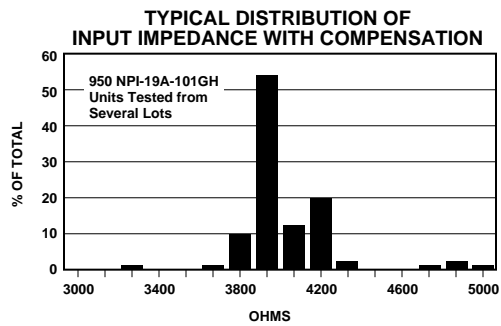
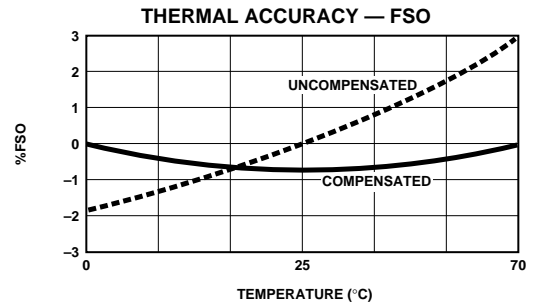
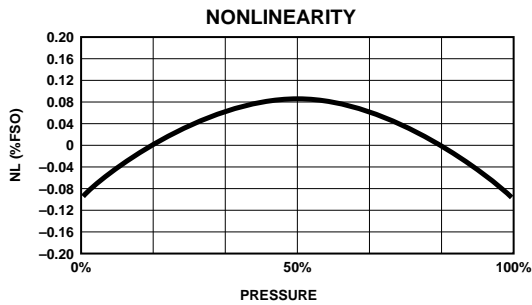
Performance ⁽⁸⁾	Compensated ⁽¹⁾				
	100, 200, 700 & 1,700 kPa				
Parameter	Units	Min.	Typ.	Max.	Notes
Offset	mV	-2	±1	2	
Full Scale Output	mV	70	100	130	2
Linearity	%FSO	-0.25	0.1	0.25	3
Hysteresis and Repeatability	%FSO	-0.05	0.01	0.05	
Thermal Accuracy of Offset	%FSO	-0.75	0.2	0.75	4
Thermal Accuracy 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

- Notes:** 1. Performance with offset, thermal accuracy of offset, and thermal accuracy of FSO compensation resistors.
2. FSO measured with 1.0mA input excitation.
3. Linearity by best fit straight line.
4. 0 to +70°C with reference to 25°C.
5. 0 to 70°C.
6. Normalized offset/bridge voltage – 100 hours.
7. 1 year.
8. All values measured at 25°C and at 1.0mA constant current, unless otherwise noted.
9. Reduced performance outside compensation range.

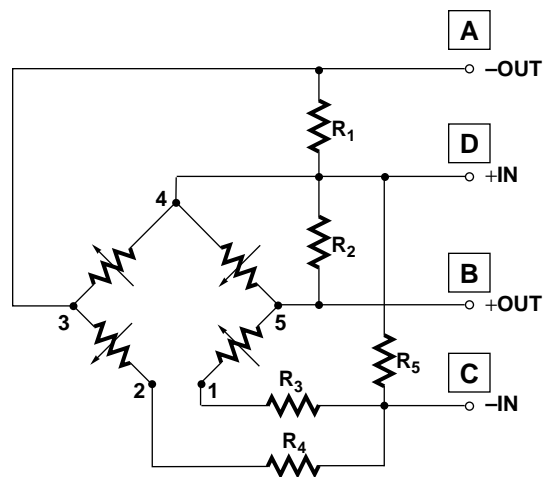


Typical Performance and Schematic Diagram

TYPICAL PERFORMANCE CHARACTERISTICS



SCHEMATIC DIAGRAM (with hybrid)



TERMINAL CONNECTIONS

A	-OUT	C	-IN
B	+OUT	D	+IN

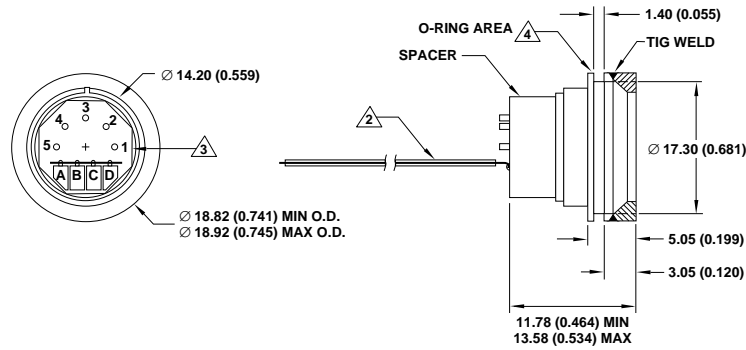
Note: Pin #4 connected to chip substrate.

Dimensions and Ordering Information

PORT TYPE A

PIN OUT

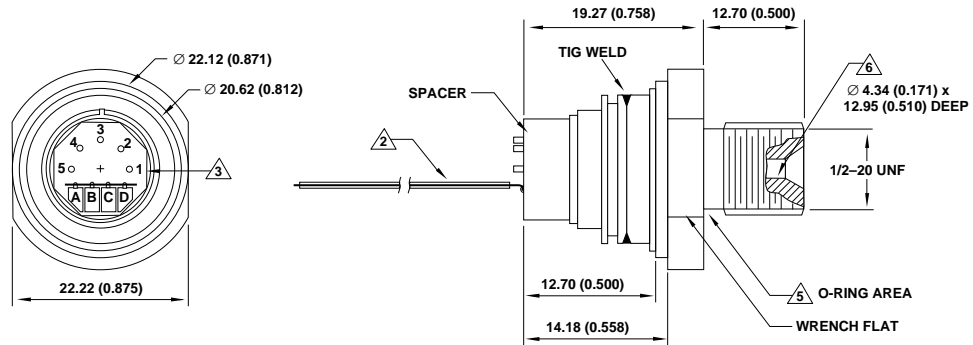
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B	+OUT
C	-IN
D	+IN



PORT TYPE B

PIN OUT

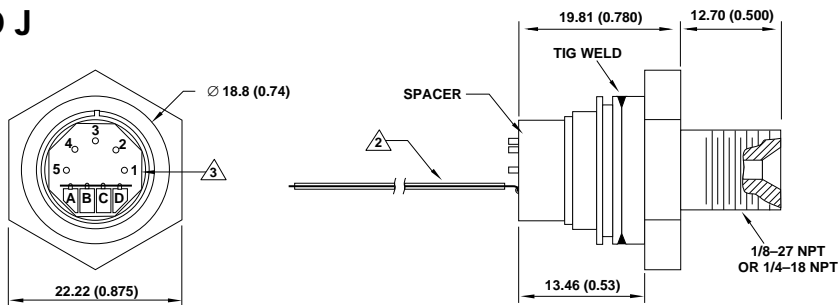
A	-OUT
B	+OUT
C	-IN
D	+IN



PORT TYPE H AND J

PIN OUT

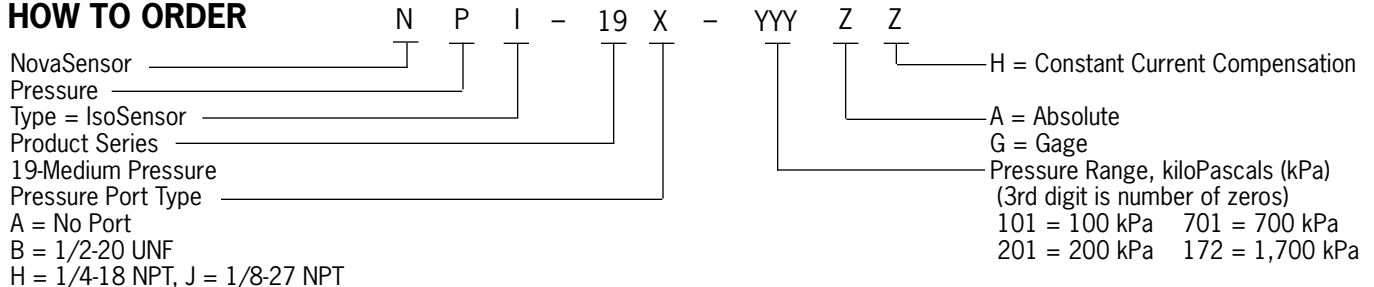
A	-OUT
B	+OUT
C	-IN
D	+IN



- Notes:
1. All dimensions are in millimeters (inches).
 2. A flat 2" long kapton flex cable is standard.
 3. Ceramic substrate.

4. Uses O-ring 0.66" ID-x 0.039" cross section.
5. Uses 2-013 per I.S.O. 360 1/1 o-ring for outside seal.
6. Uses 2-003 per I.S.O. 360 1/1 o-ring for inside seal.

HOW TO ORDER



Sales Terms: Lucas NovaSensor standard sales terms apply. Prices and specifications are subject to change without notice.

Warranty: Lucas NovaSensor warrants its products against defects in material and workmanship for 12 months from date of shipment. Products not subjected to misuse will be repaired or replaced. THE FOREGOING IS IN LIEU OF ANY OTHER EXPRESSED OR IMPLIED WARRANTIES. Lucas NovaSensor reserves the right to make changes to any product herein and assumes no liability arising out of the application or use of any product or circuit described or referenced herein.



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