Gage Pressure Transducer

Installation and Operation

#NSA-A/GP 10Harness, NSA-A/GP 2Harness, NSA-GP(0-100G)-20-P, NSA-GP(0-15G)-20-P, NSA-GP(0-200G)-20-P NSA-GP(0-300G)-20-P, NSA-GP(0-500S)-20-P, NSA-GP(0-50G)-20-P - 11/14/2019

Overview

The Gage Pressure Transducer (Air, Gases, & Liquid) Series is designed to provide excellent accuracy and reliability in commercial, industrial, and process control applications where performance is critical. The bulk micro-machined transducer features a stainless steel diaphragm with welded construction that contains no O-rings, which makes them compatible with any gas or liquid compatible with 304L stainless steel. Some of the compatible gases and liquids include refrigerants, glycol, motor oil, diesel, hydraulic fluid, brake fluid, water, waste water, Hydrogen, Nitrogen and air. The GP Series transducers can also be ordered in an optional NEMA 4 rated, weatherproof metal enclosure or a NIST Calibration Certificate. Accessory items such as pressure snubbers and pigtail syphons are available to protect the transducers from line pressure surges (pulsations) or extreme operating temperatures. This series features Packard connectors and separate harnesses allowing for installation flexibility.

Applications: Refrigeration, Fuel Cells, Pumps, Hydraulics, Compressors, Robotics, Pneumatics, Agriculture, Spraying Systems, Process Control, Flow, Hydrogen Storage, Steam Lines, Boilers, Chillers

Part Numbers

NSA-A/GP 10Harness	**NSA-A/GP 2Harness**	**NSA-GP(0-100G)-20-P**	**NSA-GP(0-15G)-20-P**
NSA-GP(0-200G)-20-P	**NSA-GP(0-300G)-20-P**	**NSA-GP(0-500S)-20-P**	**NSA-GP(0-50G)-20-P**

Specifications

Supply Voltage:	**250 Ohm Load**: +13 to 30 VDC | **500 Ohm Load**: 18 to 30 VDC
Reverse Polarity Protection:	+/- 16 V over 5 minutes
Maximum Load Resistance:	800 Ohms @ 24 VDC | **Formula**: (Supply VDC – 8 VDC) / 0.020A
Supply Current:	25 mA minimum
Output Signal:	4 to 20 mA (2-Wire, Loop Powered)
Response Time:	< 1 ms
Pressure Ranges:	**NSA-GP(0-100G)-20-P**: 0-100 psig (689 kPa) | **NSA-GP(0-15G)-20-P**: 0-15 psig (103 kPa) **NSA-GP(0-200G)-20-P**: 0-200 psig (1379 kPa) | **NSA-GP(0-300G)-20-P**: 0-300 psig (2069 kPa) **NSA-GP(0-500S)-20-P**: 0-500 psis (3447 kPa) | **NSA-GP(0-50G)-20-P**: 0-50 psig (345 kPa)
Accuracy[1] @ 22ºC (71.6ºF):	**15 to 60 psig**: < +/- 1.0% FS | **75 to 300 psig**: < +/- 0.5% FS | **500 psis[3]**: < +/- 0.5% FS
Thermal Error[2] (-40º to 105ºC):	**15 to 60 psig**: < +/- 1.0 FS | **75 to 300 psig**: < +/- 0.5% FS | **500 psis[3]**: < +/- 0.5% FS
Stability (250 Hours @ 225ºF (125ºC)):	+/- 0.03% FS @ 0 PSIG; +/- 0.12% FS @ 1000 PSIG
Proof Pressure:	**15 to 300 psig**: 3x FS | **500 psis**: 3x FS
Burst Pressure:	**15 to 300 psig**: 3x FS | **500 psis**: 3x FS
Thermal Shock:	300 Cycles (105ºC to -40ºC, 0.5 hr soaks @ Temp. (2s Transfer))
Vibration (100 to 2000Hz, 20g Sinusoidal, 3 Axes):	144 Hours
Operating Temperature Range:	-40 to 221ºF (-40 to 105ºC)
Storage Temperature Range:	-40 to 176ºF (-40 to 80ºC)
Operating Humidity Range:	0 to 95% RH, non-condensing
Media Types:	Any gas or liquid compatible with 304L Stainless Steel
Transducer Housing Material:	Stainless Steel
Process Fitting Material | Thread Size:	304L Stainless Steel | 1/4”-18 NPT
Recommend Torque Specification:	150 lbs-in (16.95 Nm)
Wiring Connections:	Packard Connector (Cables ordered separately)
Approvals:	**EMC Compliance**: 10 V/m (EN61000-4-3), CE, RoHS2, WEEE, ISO 9001
Product Dimensions (Length x Diameter):	2.60” (66.6 mm) x 0.87” (22.23 mm)
Product Weights:	**NSA-A/GP Series Transducer**: 0.30 lbs. (0.13 kg) **NSA-A/GP 2Harness**: 0.09 lbs. (0.04 kg) | **NSA-A/GP 10Harness**: 0.32 lbs. (0.14 kg)

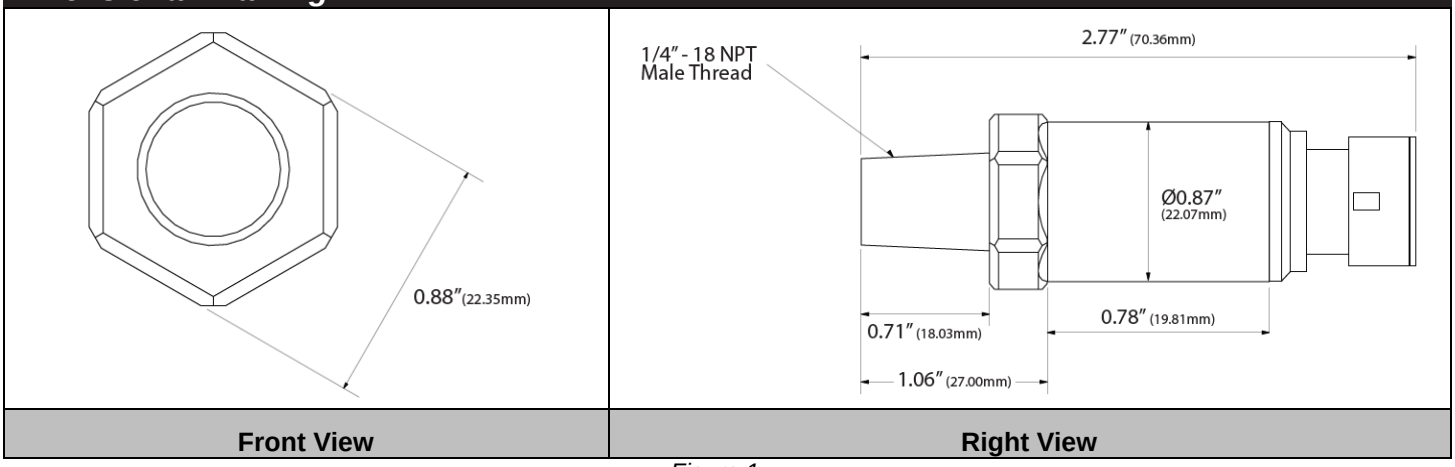
#NSA-A/GP 10Harness, NSA-A/GP 2Harness, NSA-GP(0-100G)-20-P, NSA-GP(0-15G)-20-P, NSA-GP(0-200G)-20-P NSA-GP(0-300G)-20-P, NSA-GP(0-500S)-20-P, NSA-GP(0-50G)-20-P - 11/14/2019

[1]Accuracy includes Hysteresis, Repeatability, and Non-linearity (BFSL)

[2]Additional error over temperature range

[3]Sealed Gage pressure transducers are not vented to atmosphere, but are calibrated to have 4 mA at 14.5 PSIG to resemble a standard gauge pressure transducer output

Dimensional Drawing



Front View	Right View

Figure 1

Installation

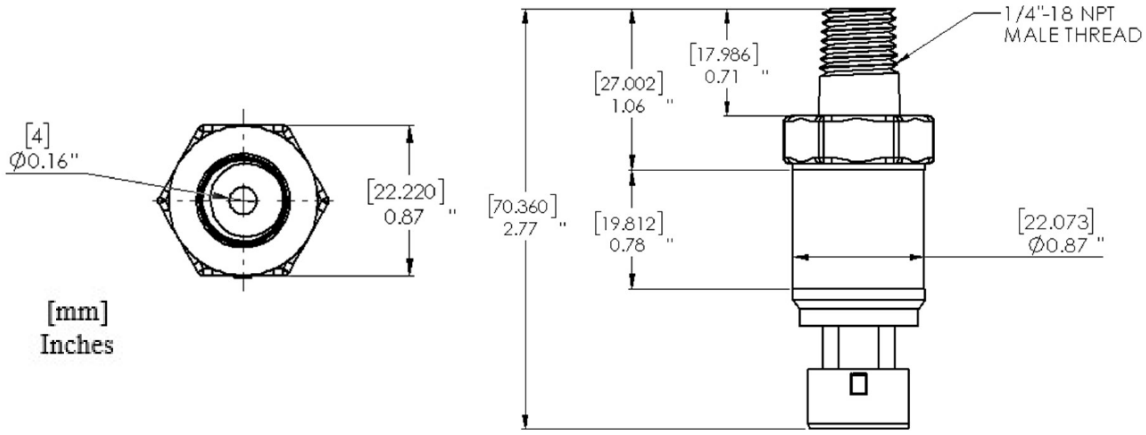


Figure 2

Location

Install the sensor in a location where it will not be exposed to extreme temperatures, vibration or shock. Install the pressure sensor above or on the side of pipes, in a location where liquid will not drip on the unit. Condensation can potentially build up and run down the harness, position the unit and harness so water does not pool on the back of the sensor. Do not install the sensor at the end of a long run of pipe.

Connection

The GP uses a standard ¼"-18 NPT external fitting. Standard pipe fittings and installation procedures should be used during installation. Install pipe tape, thread sealant or other suitable pipe compound when connecting the sensor to the pressure source or any of the accessories. For pressure ranges more than 500 PSI (3447.4 kPa), we recommend the use of a sealant such as Loctite Hydraulic Sealant. Do not use excessive amounts of sealant or you might block the pressure going into the transducer. Install the device using a wrench on the hex flats provided. Do not use a strap wrench on the body. When installing the GP sensor, the torque limit is 150 in lbs (16.95 Nm), Do Not over tighten. Over tightening metal fittings may cause a slight zero shift. The use of plastic fittings typically results in no noticeable zero shift. The torqueing effect does not appreciably affect linearity or sensitivity. In liquid pressure monitoring applications, air present in the lines will cause erratic readings, use bleed fittings to bleed off any air that has been trapped before transducer installation.

Electrical Connections

The transducer requires a supply voltage of +8 to 30 VDC with a minimum supply current of 25 mA (per unit) to power the loop. The transducer is equipped with a Packard connector for easy installation, and is designed for use with the GP Harness. Install the GP Sensor onto the harness then make the proper connections to the harness. Connect the Power lead (Red) to the plus terminal of the supply voltage. Connect the Return lead (White) to the plus terminal of the current measuring device (controller). Connect the minus terminal of the current measuring device to the minus terminal of the supply voltage, and the Shield Wire should be connected to the system or earth ground (see Figure 3).

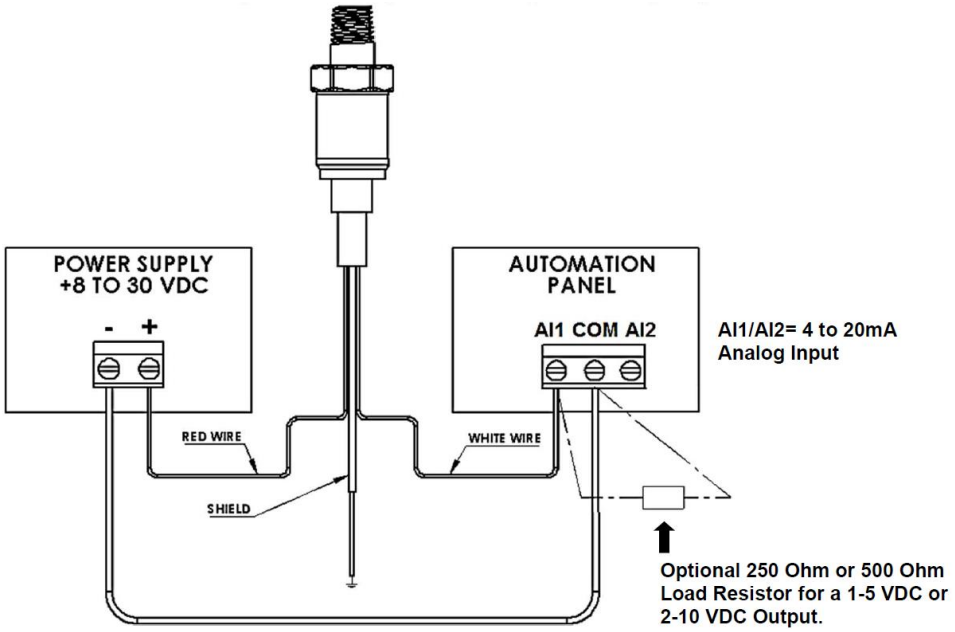


Figure 3

Optional Accessories

- **Pressure Snubber**

  Carrier recommends the use of the A/0.25" Snubber (Water or Air/Gas) with all GP series sensors. The use of a pressure snubber is a cost-effective solution that can extend the life of your sensor by smoothing out pressure spikes, surges and pulsations, and prevent debris from collecting in the sensor diaphragm opening. The A/0.25" Snubbers are made of 316 Stainless Steel and should be used with compatible materials.

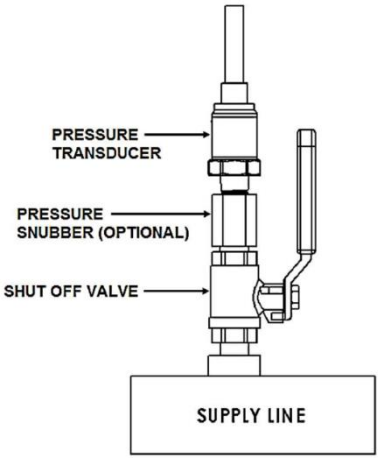


Figure 4

- **Syphons**

  The A/Syphon must be used to protect the sensor from extreme operating temperatures when the operating temperature of the steam being monitored is higher than the maximum operating temperature of the GP pressure sensor. There are three bend configurations available (90˚, 180˚, and 270˚) to allow the mounting of the sensor vertically away from the main pipe.

- **NEMA 4 Enclosure**

  Carrier recommends the use of a NEMA 4 enclosure to protect the gage pressure sensor in applications where debris and moisture could contact the sensor or electrical connections. The NSA-A/GP-(xx)-NEMA 4 GP Series pressure sensor is mounted in a NEMA 4 Rated, steel enclosure with one ½" conduit knockout. A ¼" male NPT

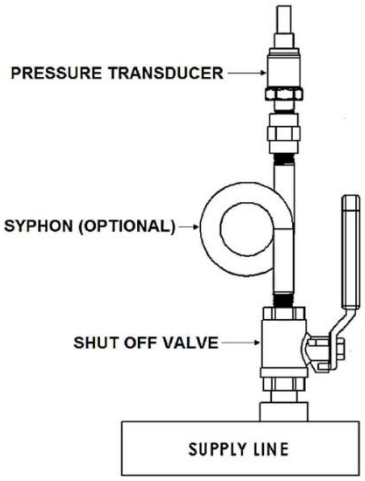


Figure 5

- **Media Compatibility**

  The bulk micro-machined transducer features a stainless steel diaphragm with welded construction that contains no O-rings, which makes them compatible with any gas or liquid that's compatible with 304L stainless steel. Some compatible gasses and liquids include refrigerants, glycol, motor oil, diesel, hydraulic fluid, brake fluid, water, waste water, hydrogen, nitrogen and air.