

4.4 Current Output Span Adjustment

Span or full scale output adjustments should only be performed by using an accurate pressure standard (electronic manometer, digital pressure gauge, etc.) with at least comparable accuracy to the 856 transducer. With full range pressure applied to the pressure port, the span may be adjusted by turning the span potentiometer screw. The factory setting is 20mA (± 0.16 mA).

5.0 MODEL 856 PERFORMANCE SPECIFICATIONS

	For Ranges 25 PSI and Higher	For Ranges Less Than 25 PSI
Accuracy RSS* (at constant temperature.)	$\pm 0.13\%$ FS	$\pm 0.25\%$ FS
Non-Linearity, BFSL	$\pm 0.1\%$ FS	$\pm 0.22\%$ FS
Hysteresis	0.08% FS	0.10% FS
Non-Repeatability	0.02% FS	0.05% FS

*RSS of Non-Linearity, Non-Repeatability and Hysteresis.

Thermal Effects

Compensated Range °F (°C)	-4 to +176 (-20 to +80)	-4 to +176 (-20 to +80)
Zero Shift %FS/100°F (50°C)	± 1.0 (± 0.9)	± 2.0 (± 1.8)
Span Shift %FS/100°F (50°C)	± 1.5 (± 1.4)	± 1.5 (± 1.3)
Warm-up Shift	$\pm 0.1\%$ FS total	$\pm 0.1\%$ FS total

RETURN POLICY

Returns are accepted on stock items up to 30 days from date of order. You must contact our Returns Department for a Return Authorization (RA) number. Return the goods - freight prepaid - in the original container and include original packing slip. C. O. D. returns are not accepted. Gems reserves the right to apply restocking charges.

Tel: 860-793-4357

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Important Points

- Gems products must be maintained and installed in strict accordance with the National Electrical Code and the applicable Gems Product Instruction Bulletin that covers installation, operating and proper maintenance. Failure to observe this information may result in serious injury or damages.
- Please adhere to the pressure and temperature limitations shown throughout this bulletin. These limitations must not be exceeded. These pressures and temperatures take into consideration possible system surge pressures/temperatures and their frequencies.
- Selection of materials for compatibility with the media is critical to the life and operation of Gems products. Take care in the proper selection of materials of construction, testing is required.
- Our sensors have been designed to resist shock and vibration. However, shock and vibration should be minimized.
- Our sensors must not be field-repaired.
- Physical damage sustained by product may render it unserviceable.



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Model 856 Gauge Pressure Transducer

1.0 GENERAL INFORMATION

Every Model 856 has been tested and calibrated before shipment. Specific performance specifications are listed on Page 7 of this Guide.

Gems Sensors 856 pressure transducers sense gauge pressure and convert this pressure to a proportional high level analog output. Two output versions are offered: A voltage output of .1 to 5.1 VDC, and a current output of 4 to 20 mA.

2.0 MECHANICAL INSTALLATION

2.1 Media Compatibility

Model 856 transducers are designed to be used with any gas or liquid compatible with 17-4 PH Stainless Steel. (Hydrogen is not recommended for use with 17-4 PH SS.)

2.2 Environment

The operating temperature limits of the 856 are as follows:

Operating Temperature Range °F (C°)	-40 to +260 (-40 to +125)
Compensated Temperature Range °F (C°)	-4 to +176 (-20 to +80)

2.3 Pressure Fittings

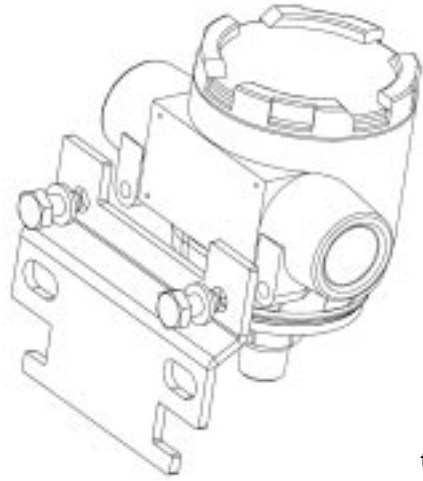
Typically, standard pipe fittings and installation procedures should be used. However, for very high pressure ranges in excess of 500 psig, we suggest the use of a sealant such as Loctite Hydraulic Sealant. Excessive high torquing of metal fittings may cause a slight shift of the output, but this shift can be trimmed out by the zero adjustment. Torquing does not significantly affect linearity or sensitivity.

2.4 Moisture Precautions

The Model 856 is provided with two 1/2" NPT female conduit ports for electrical termination. These tapered pipe threads are tapped deeper than the NPT standard, in accordance with industry guidelines. These ports must be sealed according to standard industry practice, in order to prevent moisture ingress into the Model 856.

2.5 Venting

The Model 856 is a true gauge pressure transducer. This means that the reference side of the pressure sensing diaphragm must be vented to atmosphere. If the reference side of the diaphragm were sealed (as in a sealed gauge transducer), temperature changes would cause the reference pressure to vary. This may affect the overall accuracy, especially in ranges lower than 500 psig. The Model 856 provides a vent from the reference side of the sensor to the inside of the housing and the conduit ports. The user-provided electrical conduit must be vented to atmosphere in a clean dry location. **(It is important to prevent moisture ingress from the environment into the wiring chamber or reference side of the transducer.)**



2.6 Mounting Accessories

The Model 856 is provided with a bracket and two hex bolts for mounting and a 1/2" NPT plug for the unused conduit opening. The bracket is suitable for mounting with a U-bolt or a band clamp. There are 1/4-20 UNC threaded holes on the back of the 856 transducer for direct mounting and/or grounding.

3.0 ELECTRICAL INSTALLATION

Wiring is through 1 1/2" conduit opening. Remove the screw cover to access the removable wiring terminal block connector. The terminal block connector version has five terminals for wiring +EXC, -EXC, ND, -OUT, and +OUT (see Diagram 1).

Remove the terminal block connector to facilitate wiring to screw terminals. Refer to the terminal block connector label for terminal designations. (See Diagram 2 for screw terminal designations.) After wiring, plug connector back into pin socket and neatly tuck all wiring into wire recess cavity.

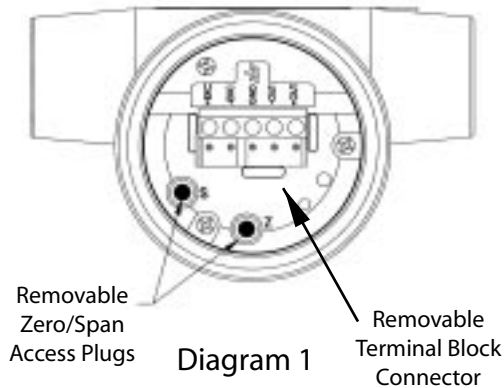


Diagram 1

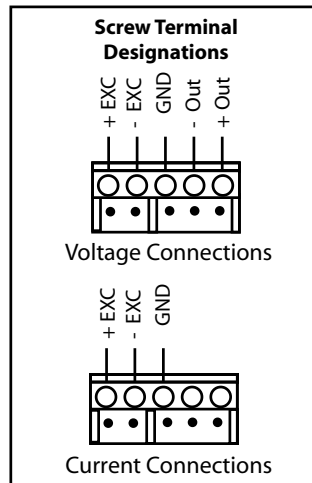


Diagram 2

3.1 Voltage Output Units

The Model 856 is a 3-wire circuit. The -EXC and -OUT are commoned on the circuit. The 856 can operate from a 12 to 28 VDC excitation. The 856 has a 0.1 - 5.1 VDC output.

- + Excitation; connect to 12-28 VDC power supply
- + Output; connect to controller or monitor
- Output; connect to controller or monitor
- Excitation, connect to return or 12-28 VDC power supply
- GND Connect to system or earth ground

The Model 856 can be wired as a three wire device by connecting -output, excitation and shield to a common ground. However, accuracy will be reduced with increase in lead resistance.

3.2 Current Output Units

The 4-20 mA current output units are designed to have current flow in one direction only - **PLEASE OBSERVE POLARITY.**

We suggest that the electrical conduit shield be connected to the system's loop circuit ground to improve electrical noise rejection.

The Model 856 is a two-wire loop-powered 4 to 20mA current output unit and delivers rated current into any external load of 0-800 ohms. (See Diagram 2 for location of +EXC and -EXC current output screw terminals.) The current flows into the + terminal and returns back to the power supply through the - terminal. (The center GND terminal may be used for shielding.) The power supply must be a DC voltage source with a voltage range between 9 and 30 measured between the + and - terminals. The unit is calibrated at the factory with a 24 VDC loop supply voltage and a 250 ohm load.

Minimum Supply Voltage (VDC) = $9 + 0.02 \times (\text{resistance of receiver plus line})$
 Maximum Supply Voltage (VDC) = $30 + 0.004 \times (\text{resistance of receiver plus line})$

4.0 CALIBRATION

The 856 transducer is factory calibrated and should require no field adjustment. Whenever possible, any zero and/or span offsets should be corrected by software adjustment in the user's control system. However, both zero and span adjustments are accessible by removing the screw top cover and the adjustment access cover and turning the potentiometer screw inside. (See Diagram 1 for the location of the Zero and Span potentiometers.)

4.1 Voltage Output Zero Adjustment

While monitoring the voltage between the positive output (+OUT) and negative output (-OUT), and with the pressure port open to atmosphere, or with zero pressure applied, the zero may be adjusted by turning the zero potentiometer screw. The factory setting is 0.1 VDC ($\pm 25\text{mV}$).
 Note: -OUT and -EXC are commoned on the circuit.

4.2 Voltage Output Span Adjustment (Complete the zero adjustment before setting span.)

Span or full scale output adjustments should only be performed by using an accurate pressure standard (electronic manometer, digital pressure gauge, etc.), with at least comparable accuracy to the 856 transducer. With full range pressure applied to the pressure port, the span may be adjusted by turning the span potentiometer screw. The factory setting is 5.1 VDC ($\pm 50\text{mV}$).

4.3 Current Output Zero Adjustment

While monitoring the current output, and with the pressure port open to atmosphere or with zero pressure applied, the zero may be adjusted by turning the zero potentiometer screw. The factory setting is 4mA ($\pm 0.08\text{mA}$).