



## Gems Sensor 865 Series Pressure Transducer

### 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**

**Fax: 860-793-4563**

### 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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Gems Sensors  
One Cowles Road  
Plainville, CT 06062-1198  
Toll-Free: 1-800-378-1600

## 1.0 GENERAL INFORMATION

Every Model 865 has been tested and calibrated before shipment. Specific performance specifications are shown on page 3 of this Guide.

Gems Sensors 865 pressure transducers sense differential or gage (static) pressure and convert this pressure difference to a proportional high level analog output for both unidirectional and bidirectional pressure ranges. The Model 865 is available in the following excitation and output versions:

Excitation	Output
9-30 VDC	0-5 VDC
9-30 VAC	0-5 VDC
12-30 VAC	0-10 VDC
9-30 VDC (measured between the + and - terminals)	4-20 mA

Check the label on the unit to confirm the excitation and output.

## 2.0 MECHANICAL INSTALLATION

### 2.1 Media Compatibility

Model 865 transducers are designed to be used with air or nonconducting gases. **Use with liquids or corrosive gases will damage the unit.**

### 2.2 Environment

The operating and compensated temperature limits of the 865 are 0°F to +150°F (-18°C to +65°C).

### 2.3 Pressure Fittings

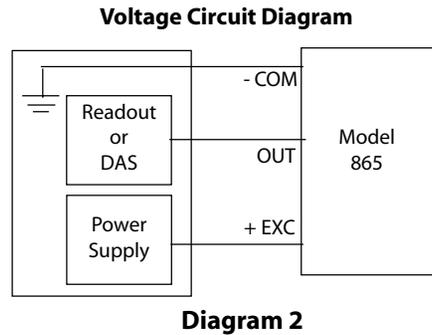
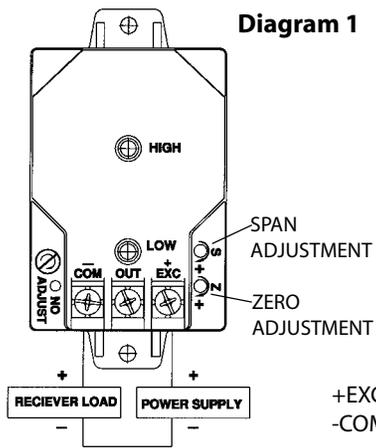
The Model 865 is supplied with two factory installed 1/4" O.D. pressure fittings for the pressure signal connection and typically installed with 1/4" push-on tubing. Both the positive (high) pressure port and the reference (low) pressure port are located on the front of the unit, labeled "HIGH" and "LOW" respectively. For best results (shortest response times), 3/16" I.D. tubing is suggested for tubing lengths up to 100 feet long, 1/4" I.D. for tubing lengths up to 300 feet, and 3/8" I.D. for tubing lengths up to 900 feet.

## 3.0 ELECTRICAL INSTALLATION

If the Model 865 is supplied with the optional Conduit Enclosure, access the electrical terminations by removing the cover.

### 3.1 Voltage Output Units

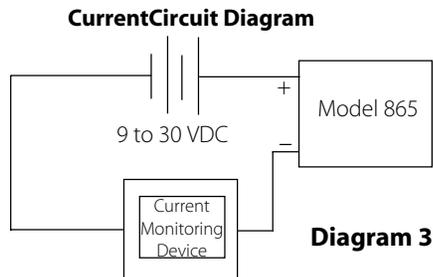
The Model 865 voltage output is a 3-wire circuit, with three terminals available for wiring. These terminals have the designation COM, OUT and EXC (see Diagram 1). [Note: The - designation above COM and the + designation above EXC are designations for the current output terminals.] The -Excitation and -Output are commoned on the circuit (see Diagram 2). The 865 voltage output can operate from 9-30 VDC or 9-30 VAC excitation with 0-5 VDC output, or 12-30 VAC excitation with 0-10 VDC output.



+EXC Connected to positive terminal of DC/AC power supply  
 -COM Connect as the reference for power supply and output signal  
 OUT Connect to positive terminal of control or pressure monitor

### 3.2 Current Output Units

The Model 865 is a two-wire loop-powered 4 to 20mA current output unit (see Diagram 3). The current flows into + terminal and returns back to the power supply through the - terminal (see Diagram 3). The power supply must be a DC voltage source with a voltage range between 9 and 30 measured between terminal + and - terminals. The unit is calibrated at the factory with a 24 VDC loop supply voltage and a 250 ohm load.



## 4.0. CALIBRATION

The 865 transducer is factory calibrated and should require no field adjustment. Generally, the mounting position will have a zero shift effect on ranges below 1" WC. 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 either on the front of the unit or by removing the optional conduit enclosure. The 865 transducer is calibrated in the vertical position at the factory.

### 4.1 Voltage Output Zero Adjustment

While monitoring the voltage between the positive output (OUT) and common (COM), and with both pressure ports open to atmosphere, the zero may be adjusted by turning the zero adjustment screw. (See Diagram 1 for

location of zero adjustment.) For 0-5 VDC output units, the factory settings are 0.0VDC ( $\pm 50\text{mV}$ ) for unidirectional pressure ranges and 2.5VDC ( $\pm 50\text{mV}$ ) for bidirectional pressure ranges. Optional outputs are set at the same  $\pm 1\%$  factory setting.

### 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 gage, etc.), with at least comparable accuracy to the 865 transducer ( $< \pm 1\%$  FS). With full range pressure applied to the high pressure port (reference port open to atmosphere), the span may be adjusted by turning the SPAN adjustment screw. (See Diagram 1 for location of the SPAN adjustment.) For 0-5 VDC output units, the factory settings are 5.0 VDC ( $\pm 50\text{mV}$ ) for unidirectional and bidirectional ranges. Optional outputs are set at the same  $\pm 1\%$  factory setting.

### 4.3 Current Output Zero Adjustment

While monitoring the current output between +EXC and OUT, and with both pressure ports open to atmosphere, the zero may be adjusted by turning the zero adjustment screw. (See Diagram 1 for location of zero adjustment.) The factory settings are 4mA (0.16mA) for unidirectional pressure ranges and 12mA (0.16mA) for bidirectional ranges.

### 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 gage, etc.) with at least comparable accuracy to the 865 transducer ( $< \pm 1\%$  FS). With full range pressure applied to the high pressure port (reference port open to atmosphere), the span may be adjusted by turning the SPAN adjustment screw. (See Diagram 1 for location of SPAN adjustment.) The factory settings are 20mA (0.16mA) for unidirectional and bidirectional pressure ranges.

## 5.0 MODEL 865 PERFORMANCE SPECIFICATIONS

Accuracy RSS* (at constant temperature.)	$\pm 1.0\%$ FS	<u>Thermal Effects</u>	
Non-Linearity, BFSL	$\pm 0.98\%$ FS	Compensated Range $^{\circ}\text{F}(^{\circ}\text{C})$	0 to +150 (-18 to +65)
Hysteresis	0.1% FS	Zero/Span Shift $\% \text{FS}/^{\circ}\text{F}(^{\circ}\text{C})$	0.033 (0.06)
Non-Repeatability	0.05% FS	Maximum Line Pressure	10 psi
*RSS of Non-Linearity, Non-Repeatability and Hysteresis.		Overpressure	10 psi in positive or negative direction
		Warm-up Shift	$\pm 0.1\%$ FS total
<u>Position Effects</u>			
(Unit is factory calibrated at 0g effect in the vertical position)			
Range	Zero Offset ( $\% \text{FS}/\text{G}$ )		
0 to 1" WC	.22		
0 to 5" WC	.14		
0 to 30" WC	.06		