

## Pressure Sensor

### Force/Pressure Transducer

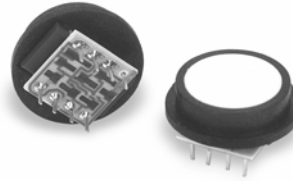
### Model 1865 Series

#### FEATURES

- Silicon pressure/force interface diaphragm
- Force measurement for infusion pump applications
- Pressure measurement for liquid media
- Medical-grade materials
- 8-pin DIP electrical connection
- Laser trimmed
- Choice of voltage or constant current excitation

#### TYPICAL APPLICATIONS

- Infusion pumps
- Anesthesia monitors
- Non-corrosive, non-pressurized media-level sensors
- Ventilation systems
- Blood pressure equipment
- Syringe pumps
- Drug delivery systems



The Model 1865 is a high-performance transducer specifically designed to address the needs of medical and specialized OEM applications. Offering laser-trimmed compensation, the Model 1865 may be specified to operate with either a constant current or voltage supply.

The Model 1865 employs a solid state piezoresistive pressure transducer mounted in a plastic package. For applications where force is applied by a flexible membrane to the sensor, such as found in infusion pumps, the Model 1865's precision height silicone diaphragm provides long life and is a reliable replacement for older force or load cell transducers. Utilizing a silicon rubber diaphragm, the 1865 is compatible with some liquid media applications.

The Model 1865 provides access to important safety features in critical care medical instrumentation, such as occlusion pressure or infiltration detection. The pressure data can provide medical personnel with useful diagnostic information regarding the condition of the patient's circulatory system. These force/pressure transducers can also be used with other medical dispensing devices, such as syringe pumps, to improve safety and accuracy.

May be operated in either current or voltage excitation, the Model 1865's output can be amplified or signal conditioned, as required. The semiconductor-based sensor offers high resolution using its Wheatstone Bridge strain gauge design. The height of the unit's patented, poured-in-place silicon rubber diaphragm is controlled to ensure sensitivity to low pressure. This diaphragm is bonded to a plastic header and transmits force applied through a special silicone gel to the diaphragm of a silicon piezoresistive die. The back of the die is exposed to atmospheric pressure, which results in a gauge pressure output.

#### **⚠ WARNING**

##### **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

#### **⚠ WARNING**

##### **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

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### ELECTRICAL SPECIFICATIONS

	Ratings
Input impedance	
Current excitation	2.0 KOhm min. to 8.0 KOhm max.
Voltage excitation	8.0 KOhm min. to 40 KOhm max.
Output impedance	
Current excitation	3.5 KOhm min. to 6.0 KOhm max.
Voltage excitation	3.5 KOhm min. to 6.0 KOhm max.
Input excitation	
Current	< 2.0 mA
Voltage	< 15.0 Vdc
Effect of excitation change	Ratiometric
Response time (10% to 90%)	≤ 5 milliseconds
Insulation resistance	≥ 100 MOhm at 50 Vdc
Output common mode voltage	50 % of input typical

### PHYSICAL SPECIFICATIONS

	Specification
Pressure over-range protection	3X span or 60 psi, whichever is least
Media/materials compatibility	
Top side	Room atmosphere, directly applied force, and liquids compatible with dimethyl silicon, polyetherimide (Ultem)
Bottom side	Non-corrosive dry gasses and fluids compatible with silicon, Pyrex, RTV silicone, and ceramic
Mass	3.0 g with laser-trim board

### ENVIRONMENTAL CONDITIONS

	Specification
Position effect	≤ 0.05 % of zero or span shift for 90° tilt in any direction
Vibration effect	No change in performance at 10 Gs RMS, 20 Hz to 2,000 Hz
Shock	100 Gs for 11 milliseconds
Life	1 million cycles

### PERFORMANCE SPECIFICATIONS

	Min.	Typ.	Max.	Unit
<b>Temperature Compensated Performance</b>				
Nonlinearity	-	0.10	0.25	% of Span, BFSL
Hysteresis	-	0.0125	0.015	% of Span, BFSL
Repeatability	-	0.0125	0.015	% of Span, BFSL
Output (laser trimmed normalized)				
Current excitation	98	100	102	mVdc
Voltage Excitation	38	40	42	mVdc
Zero pressure	-2	0	2	mVdc
<b>Temperature Performance</b>				
Compensated temperature range	-1 °C to 54 °C [30 °F to 129 °F]			
Operating temperature range	-28 °C to 54 °C [-19 °F to 129 °F]			
Maximum zero error			0.5	% of Span in reference to 27 °C [80.6 °F]
Maximum span error			0.5	% of Span in reference to 27 °C [80.6 °F]
Thermal hysteresis			0.2	% of Span, compensated temperature range
<b>Long-term stability</b>			± 0.3	% of Span per six months

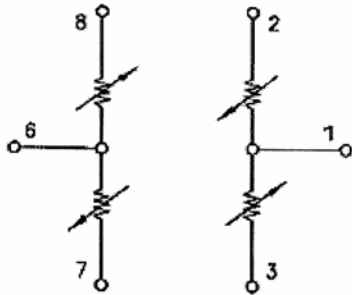
# Pressure Sensors

## Force/Pressure Transducer

## Model 1865 Series

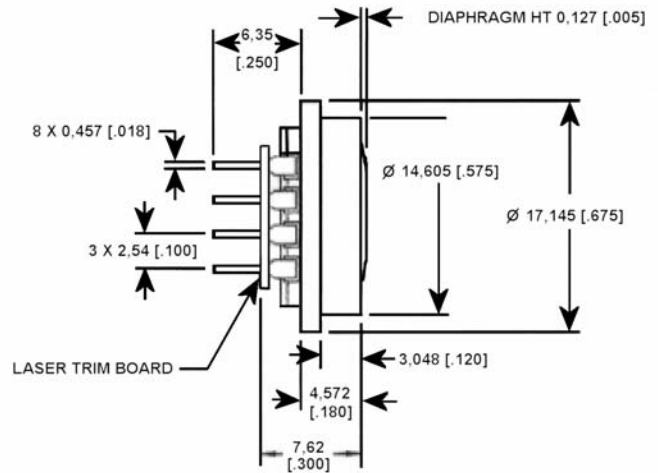
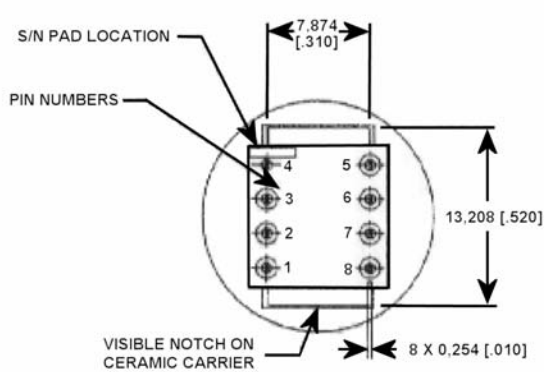
**FIGURE 1. LASER TRIM BOARD**

Current Excitation, Normalized Output



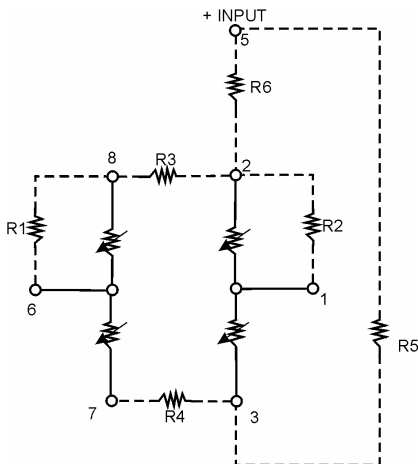
Pin	Connection	Pin	Connection
1	+ Output	5	+ Input
2	NC	6	- Output
3	- Input	7	NC
4	NC	8	NC

**FIGURE 2. DIMENSIONAL DRAWING (FOR REFERENCE ONLY)**



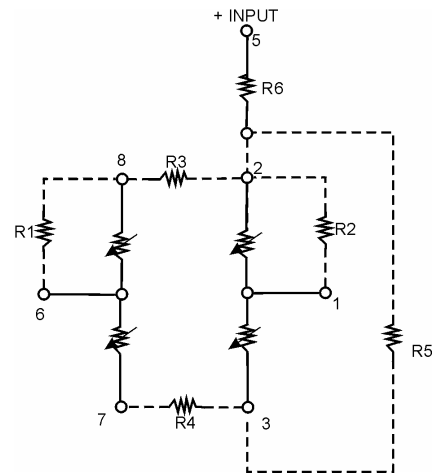
**FIGURE 3. LASER TRIM BOARD**

Current Excitation, Normalized Output



**FIGURE 3. LASER TRIM BOARD**

Voltage Excitation, Normalized Output

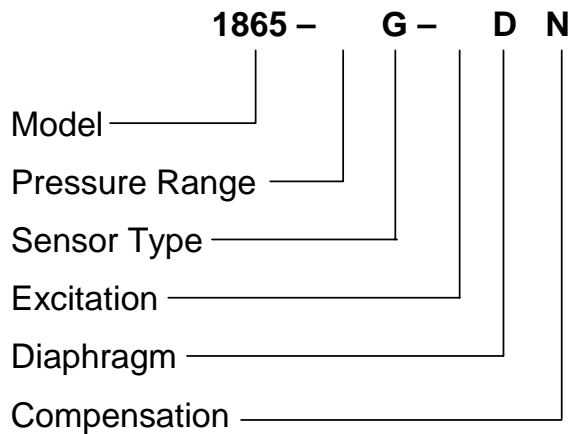


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*Model 1865 Series*

## ORDER GUIDE



## PRESSURE RANGE

01 = 0 psi to 5 psi  
02 = 0 psi to 10 psi  
03 = 0 psi to 15 psi  
05 = 0 psi to 25 psi  
07 = 0 psi to 30 psi

## SENSOR TYPE

G = Gauge Pressure

## EXCITATION

L = 1.5 mA  
K = 10 Vdc

## DIAPHRAGM TYPE

D = Dimethyl Silicone

## COMPENSATION

N = Laser trimmed, normalized output

## ACCURACY GUIDE

Higher accuracy grades are available as specials.  
Custom configurations are available on request

## WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. **The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.**

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While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

For application assistance, current specifications, or name of the nearest Authorized Distributor, contact a nearby sales office. Or call:

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1-815-235-6847 International

## FAX

1-815-235-6545 USA

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