Honeywell

Model 1865 Series

Force/Pressure transducer

DESCRIPTION

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 peizoresistive die. The back of the die is exposed to atmospheric pressure, which results in a gauge pressure output.

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, nonpressurized media-level sensors
- Ventilation systems
- Blood pressure equipment
- Syringe pumps
- Drug delivery systems

Model 1865 Series

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

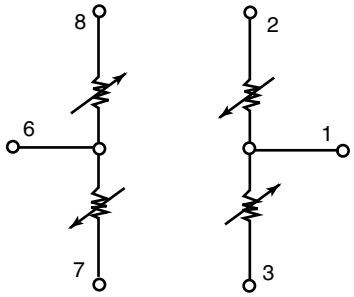
ENVIRONMENTAL CONDITIONS

	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
Temperature Compensated Performance				
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
Temperature Performance				
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
Long-term stability			± 0.3	% of Span per six months

FIGURE 1. SENSING ELEMENTS



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

REFERENCE CONDITIONS

	Specification
Media temperature	27 °C ± 1 °C [80 °F ± 2 °F]
Ambient temperature	27 °C ± 1 °C [80 °F ± 2 °F]
Vibration	0.1 G (1 m/s/s) max.
Humidity	50 % ± 10 %
Ambient pressure	12.8 psi to 16.5 psi [860 mBar to 1060 mBar]
Excitation source	1.5 mAdc ± 0.0015 mAdc or 10.0 Vdc ± 0.01 Vdc

FIGURE 2. MOUNTING DIMENSIONS IN MM (INCHES), FOR REFERENCE ONLY

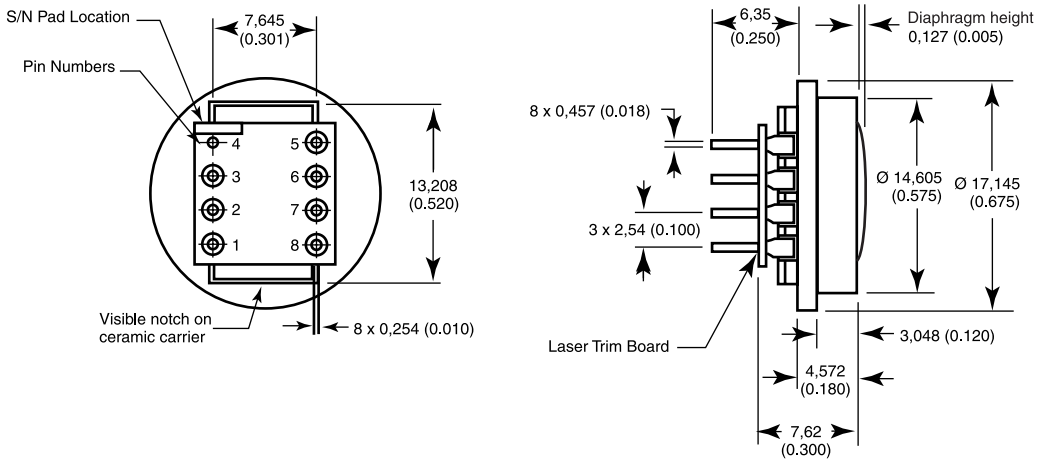


FIGURE 3. LASER TRIM BOARD

Current Excitation, Normalized Output

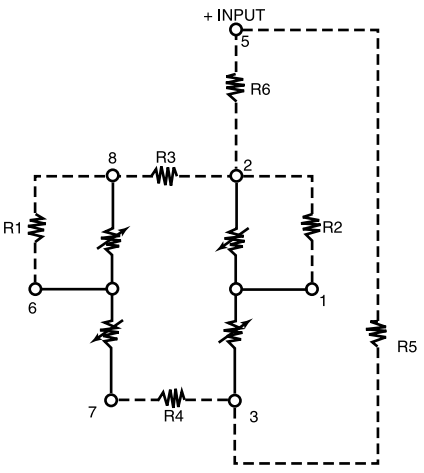
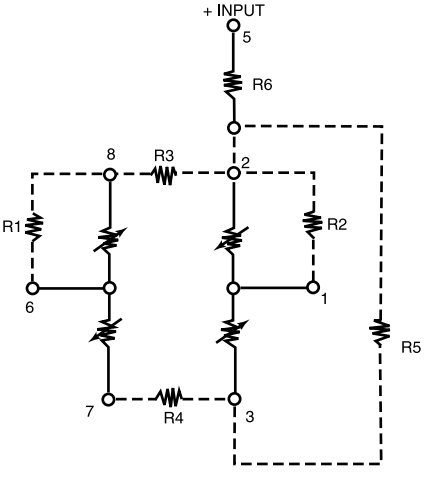
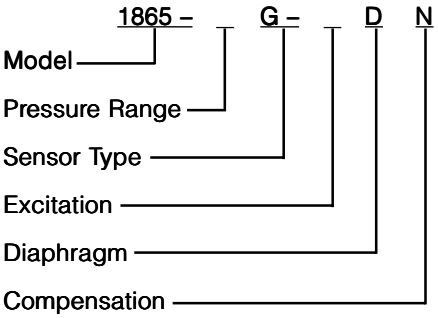


FIGURE 4. LASER TRIM BOARD

Voltage, Normalized Output



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 GRADE

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. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

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.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

⚠ 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.**

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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⚠ 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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