13MM SERIES

008360
Issue 2

13V: SEMI F20 compatible 316L stainless steel, media-isolated sensors

DESCRIPTION

Honeywell 13V Series stainless steel pressure sensors are designed for Ultra High Purity (UHP) applications that involve measurement of gases and liquid flow in harsh environments.

The rugged, media isolated package pressure sensor uses the Honeywell proven piezoresistive semiconductor sensor chip in an oil-isolated housing. This design has proven to be highly reliable, stable and accurate. Designed with a SEMI F20 compatible ring and diaphragm, this sensor exhibits exceptional corrosion resistance and specifically designed to withstand the aggressive nature of halogenated gases commonly encountered in semiconductor manufacturing processes. Its robust construction ensures protection against environmental factors while maintaining accurate pressure measurements.

The 13V pressure sensor designed to minimize the offset drift under prolonged vacuum conditions, making it an ideal choice for critical industrial applications where measurement accuracy and material integrity are crucial. These sensors feature a weld-ring collar and special back support ring for high cycle life capability as they are designed for further package integration in OEM (Original Equipment Manufacturer) applications.

FEATURES[1]

- 500 psia[1]
- SEMI F20 compatible
- Rugged, isolated stainless steel package

MECHANICAL AND ENVIRONMENTAL SPECIFICATIONS

- Wetted component: Weld ring and diaphragm as per SEMI F20 UHP standard
- Life: 10 million pressure cycles minimum
- Vibration: 10 G at 20 Hz to 2000 Hz as per IEC 60068-2-6
- Shock: 50 G as per IEC 60068-2-27
- Insulation resistance: 100 MOhm at 50 Vdc
- Surface finish (diaphragm): < Ra 0.127 µm for the non-welded, central area of the diaphragm
- Storage temperature -40°C to 125°C [-40°F to 257°F]
- Operating temperature -40°C to 125°C [-40°F to 257°F]

REGULATIONS

- **SEMI F20 compatible:** SEMI F20 compliant sensors can simplify regulatory compliance since they are designed to meet recognized industry standards. This compliance not only aids in fulfilling quality assurance requirements but also positions favorably in audits and inspections related to manufacturing practices

APPLICATIONS

- Semiconductor equipment
- Integrated Gas Systems (IGS)
- Process control gas
- Mass flow controller
- Liquid flow monitoring
- Solar panels
- Displays/Instrumentation
- Medical equipment

DIFFERENTIATION

- SEMI F20 for ultra-high purity applications
- Reliable and proven piezoresistive semiconductor technology
- Cell for further OEM package integration
- Minimum offset drift under vaccum
- Compatible media with stainless steel, typ. include common gases used in semiconductor manufacturing

ORDERING INFORMATION[1]

SKU listing Part: **13V0500PA0K**

PORTFOLIO

The 13V Series is part of an extensive line of heavy-duty pressure sensors. To learn more about the product, or the many other Honeywell pressure sensors in this series, click here.

[1]Additional product features available upon request:
- Lower pressure ranges (<100 psi) available
- Ribbon cable electrical connection available
- Both temperature compensated and uncompensated options

Honeywell

TABLE 1. 13V0500PA0K PERFORMANCE CHARACTERISTICS[1,10]

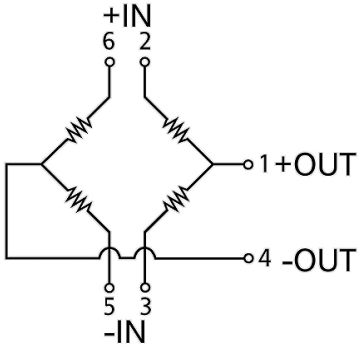
Characteristic	Minimum	Typical	Maximum	Units
Span output signal[2]	30	–	48	mV/V
Zero pressure offset	-7.5	–	+7.5	mV/V
Pressure non-linearity[3]	-0.1	–	0.1	%FSS
Pressure hysteresis[3]	-0.03	–	0.03	%FSS
Repeatability	-0.02	–	0.02	%FSS
Supply voltage (V_S)[11]	5 Vdc ±0.01 Vdc			
Temp. coefficient of span[4] (0°C to 82°C [32°F to 180°F])	360	990	1620	ppm/°C
Temp. coefficient of offset[4] (0°C to 82°C [32°F to 180°F])	-30	–	30	µV/V/°C
Temp. coefficient of resistance[4] (0°C to 82°C [32°F to 180°F])	2700	3420	4500	ppm/°C
Thermal hysteresis Zero and Span (0°C to 82°C [32°F to 180°F])	-0.25	–	0.25	%FSS
Long-term stability of offset and span[8]	-0.1	–	0.1	%FSS
Response time (10 % to 90 %)[5]	–	–	0.1	ms
Input resistance	4.00	5.0	6.0	kΩ
Output resistance	4.00	5.0	6.0	kΩ
Pressure overload[6]	1200	–	–	psi
Pressure burst[7]	2400	–	–	psi
Wetted material[9]	316L stainless steel			

Note 1: Reference Conditions (unless otherwise noted): T_A = 25°C [77°F]; Supply V_S = 5 Vdc ±0.01 Vdc or I_S = 1.0 mA ±0.001 mA
Note 2: Full Scale Span (FSS) is the algebraic difference between the output voltage at full-scale pressure and the output at zero pressure. Span is ratiometric to supply voltage
Note 3: Pressure non-linearity is based on best-fit straight line from zero to full-scale pressure. Pressure hysteresis is the maximum output difference at any point within the operating pressure range for increasing and decreasing pressure
Note 4 The error band resulting from maximum deviation of a transducers output parameter (offset, span, or resistance) as temperature is varied from 25°C to any other temperature within the specified range (0 to 82°C). This parameter is not 100 % tested and is guaranteed by process design and tested on a sample basis only. Temperature coefficient of offset and span is evaluated using 1mA constant current excitation
Note 5: Response time for a 0 psi to FSS pressure step change, 10 % to 90 % rise time
Note 6: The maximum pressure that can be applied without changing the transducer's performance or accuracy
Note 7: The maximum pressure that can be applied to a transducer without rupture of either the sensing element or transducer case
Note 8: Long term stability over one year
Note 9: Weld Ring and Diaphragm as per SEMI F20 UHP standard
Note 10: Additional pressure ranges available upon request. Ribbon cable electrical connection and alternative mechanical packaging options available upon request
Note 11: Maximum supply voltage rating for the voltage version "K" is +15 Vdc

SEMI F20 COMPATIBLE 316L STAINLESS STEEL, MEDIA ISOLATED SENSORS
13MM SERIES

EQUIVALENT CIRCUIT

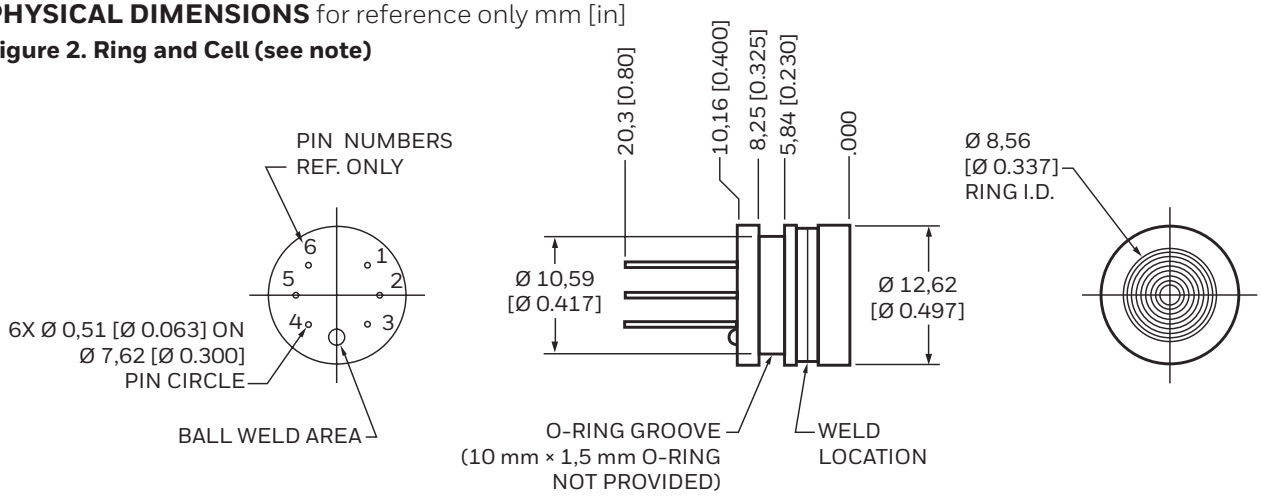
Figure 1. 13V Series Circuit



PIN OUT	
PIN #	**Designator**
1	+ Out
2	+ In
3	- In
4	- Out
5	- In
6	+ In

PHYSICAL DIMENSIONS for reference only mm [in]

Figure 2. Ring and Cell (see note)



Note: Non-concentricity effects at the diaphragm weld area may cause runout of up to ±0.006 in between the upper and lower portions of the sensor body. (It is recommended to use a counter bore to mate with this device to allow for this non-concentricity).

PRODUCT NOMENCLATURE

Figure 3. Product Configurations

13 — Type: **13mm** Series cell

V/D — Compensation

V	Uncompensated SEMI F20
D*	Compensated SEMI F20

* Compensated output available upon request

0500 — Pressure Range

500	500 psi
100*	100 psi
50*	50 psi
30*	30 psi
15*	15 psi

*additional pressure ranges available upon request.
This data sheet and specs apply to 500 psi version only.

P — Pressure Unit

P	PSI

A/S — Pressure Type

A	Absolute
S	Sealed gage

X — Pressure Connections

0	Ring and cell
1*	Ring with back support
4*	1/8-27 NPT
5*	1/4-18 NPT
6*	7/16-20 UNF

*additional package styles available upon request.

K/L — Excitation

K	5 Vdc or 1.0 mA (uncompensated and compensated versions supported)
L	I_S = 1.5 mA (compensated versions only)

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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.

For more information

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008360-2-EN | 2 | 06/25
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