

INSTALLATION INSTRUCTIONS FOR THE TRUSTABILITY™ BOARD MOUNT PRESSURE SENSORS, DPR SERIES

32347060

Issue B

1.0 GENERAL INFORMATION

The TruStability™ DPR Series is a piezoresistive silicon pressure sensor offering a ratiometric analog output for reading pressure over the specified full scale pressure span and temperature range. These sensors are fully calibrated and temperature compensated for sensor offset, sensitivity, temperature effects, and non-linearity using an on-board Application Specific Integrated Circuit (ASIC).

CAUTION

PRODUCT DAMAGE FOR SENSORS WITH LIQUID MEDIA OPTION (ONLY AVAILABLE 60 MBAR | 6 KPA | 1 PSI AND ABOVE)

- Ensure liquid media is applied to Port 1 only; Port 2 is not compatible with liquids.
- Ensure liquid media contains no particulates. All TruStability™ sensors are dead-ended devices. Particulates can accumulate inside the sensor, causing damage or affecting sensor output.
- Recommend that the sensor be positioned with Port 1 facing downwards; any particulates in the system are less likely to enter and settle within the pressure sensor if it is in this position.
- Ensure liquid media does not create a residue when dried; build-up inside the sensor may affect sensor output. Rinsing of a dead-ended sensor is difficult and has limited effectiveness for removing residue.
- Ensure liquid media are compatible with wetted materials. Noncompatible liquid media will degrade sensor performance and may lead to sensor failure.

Failure to comply with these instructions may result in product damage.

2.0 CLEANING

CAUTION

IMPROPER CLEANING

Avoid cleaning the sensor; however, if it must be cleaned ensure cleaning fluids, such as appropriate alcohols or fluorinated solvents, are used based on the type of contaminants to be removed. Do not immerse the sensor.

Failure to comply with these instructions may result in product damage.

3.0 SPECIFICATIONS AND MOUNTING DIMENSIONS

See Tables 1 through 8, and Figures 3 through 6.

TABLE 1. ABSOLUTE MAXIMUM RATINGS¹

CHARACTERISTIC	MIN.	MAX.	UNIT
Supply voltage (V_{supply})	-5.0	12.0	Vdc
Voltage on output pin	-0.3	6.0	Vdc
Working pressure	—	135	inH ₂ O
Overpressure	—	270	inH ₂ O
Burst pressure	—	415	inH ₂ O

¹Absolute maximum ratings are the extreme limits the device will withstand without damage.

TABLE 2. ENVIRONMENTAL SPECIFICATIONS

CHARACTERISTIC	PARAMETER
Humidity	0 %RH to 95 %RH, non-condensing
Vibration	15 g, 10 Hz to 2 kHz
Shock	100 g, 6 ms duration
ESD susceptibility	3 kV min, human body model
Life ¹	1 million pressure cycles minimum
Orientation sensitivity (± 1 g)	± 0.08 %FSS typical

¹Life may vary depending on the specific application in which the sensor is utilized.

TABLE 3. WETTED MATERIALS¹

COMPONENT	MATERIAL	
	PORT 1 (PRESSURE PORT)	PORT 2 (REFERENCE PORT)
Ports and covers	high temperature polyamide	
Substrate	alumina ceramic	
Adhesives	epoxy, silicone	
O-Ring	silicone rubber	
Electronic components	ceramic, silicon, glass, solder	silicon, glass, gold

¹Contact Honeywell Customer Service for detailed material information.

TABLE 4. SENSOR PRESSURE TYPES

PRESSURE TYPE	DESCRIPTION
Differential	Output is proportional to the difference between the pressures applied to each port (Port 1 - Port 2).

TABLE 5. OPERATING SPECIFICATIONS

CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT
Supply voltage (V_{supply}) ¹	4.75	5.0	5.25	Vdc
Minimum operating voltage	3.0	—	—	Vdc
Supply current	—	2.7	3.5	mA
Operating temperature range ²	-40 [-40]	—	85 [185]	°C [°F]
Compensated temperature range ³	-20 [-4]	—	70 [158]	°C [°F]
Startup time (power up to data ready)	—	—	5	ms
Response time	—	1	—	ms
Clipping limits: upper	—	—	97.5	% V_{supply}
lower	2.5	—	—	
Accuracy ⁴	—	—	±0.25	%FSS BFSL ⁶
Output resolution	—	0.033	—	%FSS ⁶
Orientation sensitivity (±1 g) ⁵ :				
<40 mbar 4 kPa 20 inH ₂ O	—	±0.1	—	%FSS ⁶
<2.5 mbar 250 kPa 1 inH ₂ O	—	±0.2	—	

¹Ratiometricity of the sensor (the ability of the device output to scale to the supply voltage) is achieved within the specified operating voltage.

²**Operating temperature range:** The temperature range over which the sensor will produce an output proportional to pressure.

³**Compensated temperature range:** The temperature range over which the sensor will produce an output proportional to pressure within the specified performance limits.

⁴**Accuracy:** The maximum deviation in output from a Best Fit Straight Line (BFSL) fitted to the output measured over the pressure range. Includes all errors due to pressure non-linearity, pressure hysteresis, and non-repeatability.

⁵**Orientation sensitivity:** The maximum change in offset of the sensor due to a change in position or orientation relative to Earth's gravitational field.

⁶**Full Scale Span (FSS):** The algebraic difference between the output signal measured at the maximum ($P_{max.}$) and minimum ($P_{min.}$) limits of the pressure range. (See Figure 7 for ranges).

FIGURE 1. TEB COMPONENTS FOR TRUSTABILITY™ BOARD MOUNT PRESSURE SENSORS

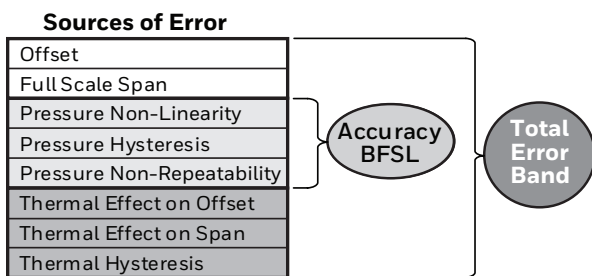
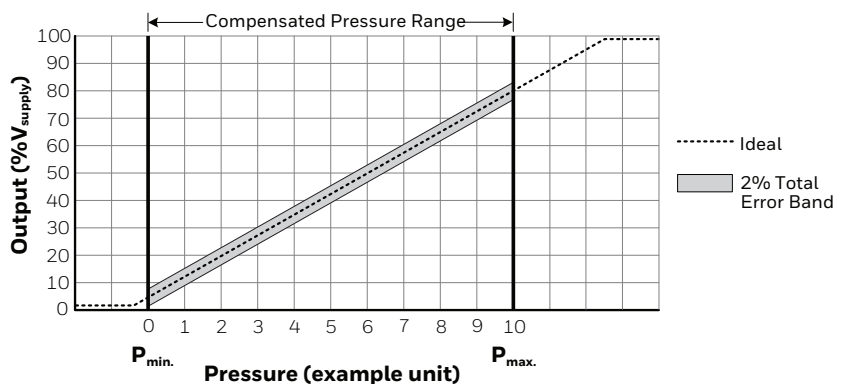
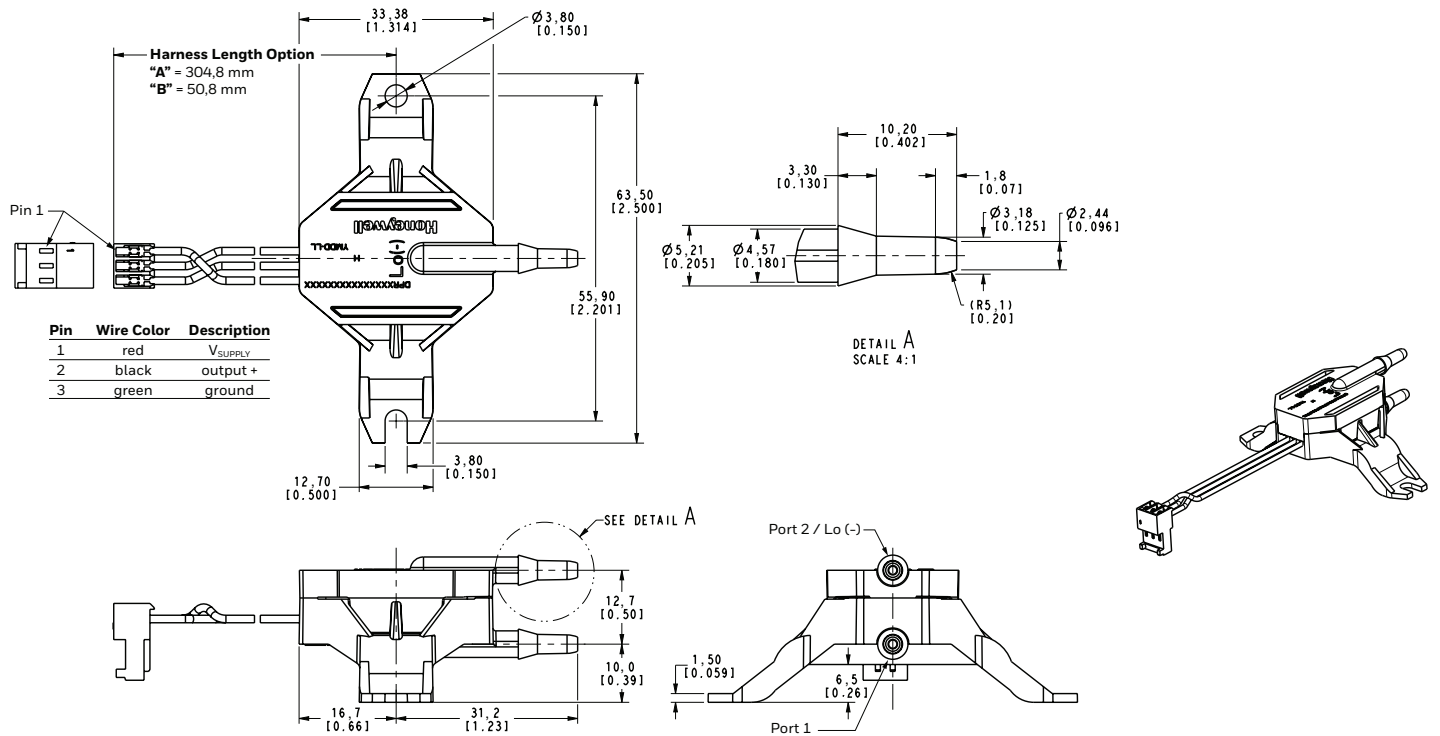


FIGURE 2. TRANSFER FUNCTION LIMITS

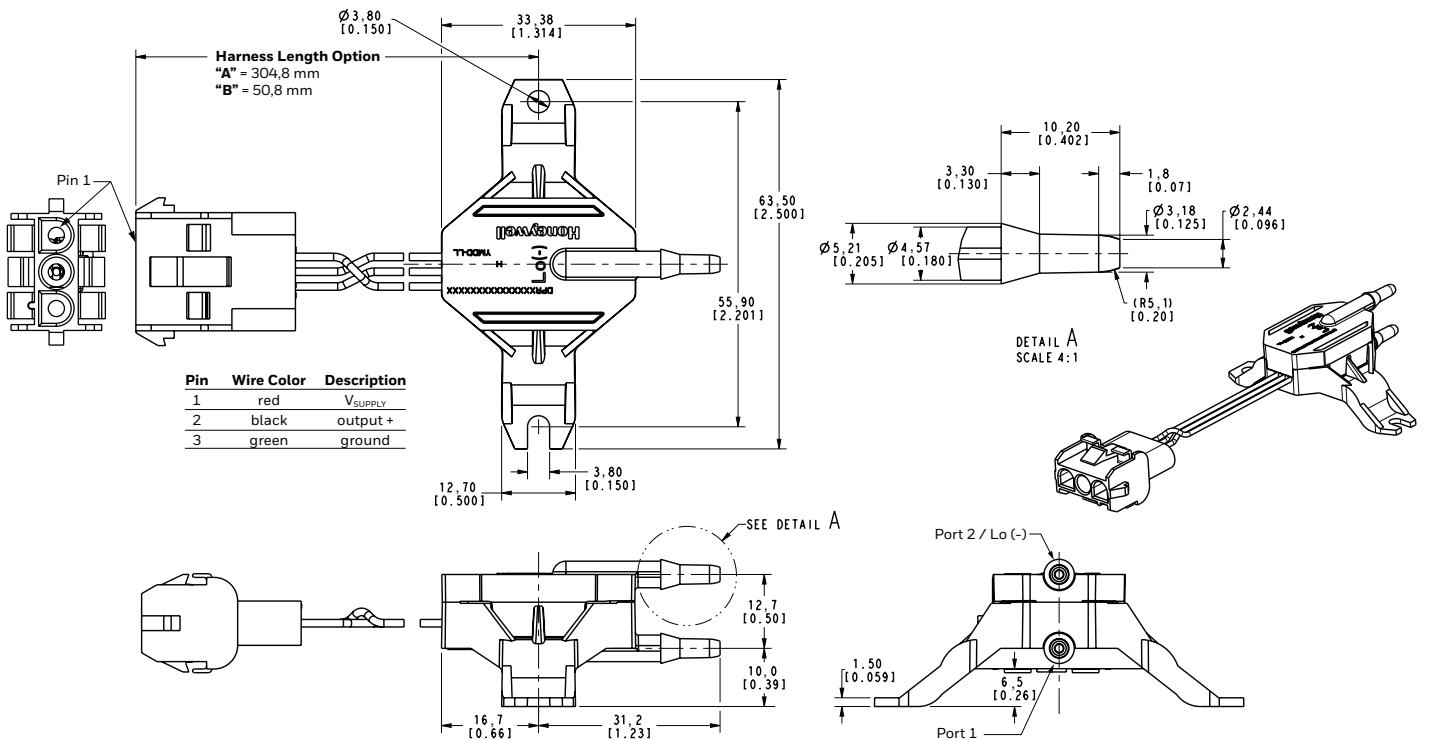


$$\text{Output (V)} = \frac{0.75 \times V_{supply}}{P_{max.} - P_{min.}} \times (\text{Pressure}_{applied} - P_{min.}) + 0.05 \times V_{supply}$$

**FIGURE 3. MOUNTING DIMENSIONS FOR ELECTRICAL TERMINATION, OPTION "A": AMP 3-643814-3
(FOR REFERENCE ONLY: MM/[IN].**



**FIGURE 4. MOUNTING DIMENSIONS FOR ELECTRICAL TERMINATION OPTION "B": AMP 1-480701-0
(FOR REFERENCE ONLY: MM/[IN].**



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FIGURE 5. MOUNTING DIMENSIONS FOR ELECTRICAL TERMINATION OPTION "C": FLYING LEADS
(FOR REFERENCE ONLY: MM/[IN].)

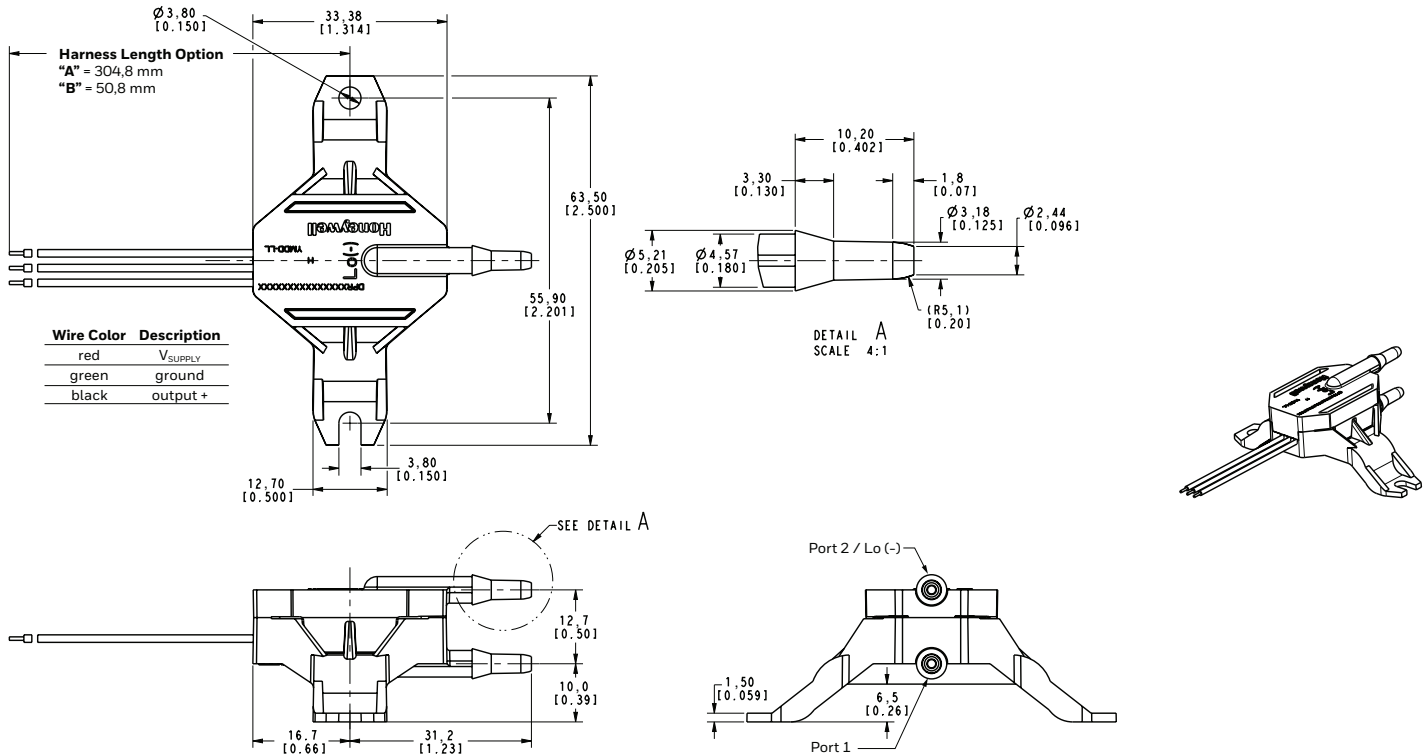
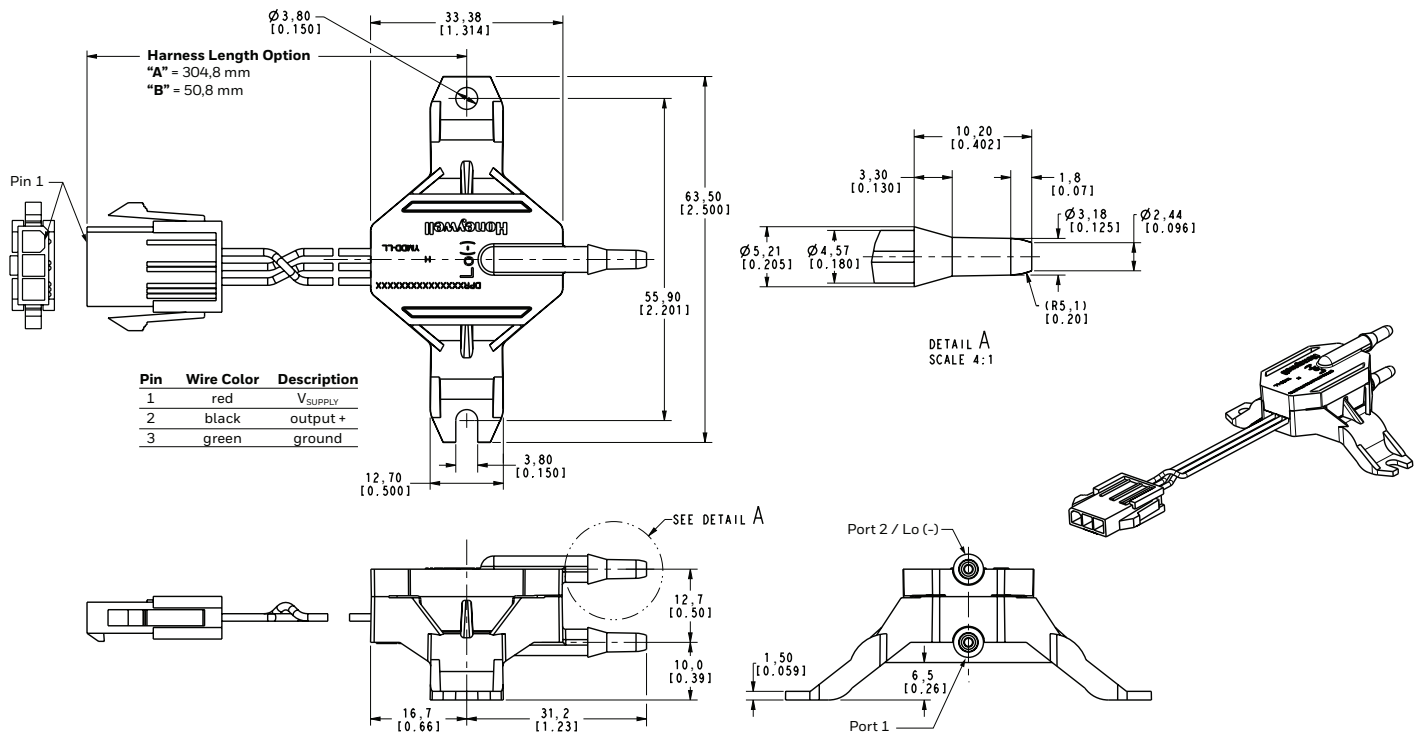


FIGURE 6. MOUNTING DIMENSIONS FOR ELECTRICAL TERMINATION OPTION "D": MOLEX 39-01-4033
(FOR REFERENCE ONLY: MM/[IN].)



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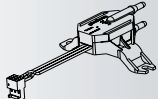
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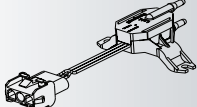
FIGURE 7. NOMENCLATURE AND ORDER GUIDE

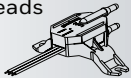
For example, **DPRCAN0002NG0000A5** defines a DPR Series, Standard Accuracy, Compensated/Amplified, flying leads, 304.8 mm harness length, no gel, 0 inH₂O to 2 inH₂O pressure range, analog output type, 5% to 80% of V_{supply} transfer function, 5.0 Vdc supply voltage.

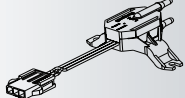
D P R C A N 0 0 0 2 N G 0 0 0 0 A 5

Product Series
DPR Standard accuracy, compensated/amplified

Electrical Termination
AMP 3-643814-3
A 

AMP 1-480701-0
B 

Flying leads
C 

Molex 39-01-4033
D 

Harness Length
A 304,8 mm
B 50,8 mm

Gel
N No gel

Supply Voltage
5 5.0 Vdc

Transfer Function
A 5% to 80% of V_{supply} (analog output)
B 10% to 90% of V_{supply} (analog output)

Pressure Range

Differential		Gage	
P _{max.}	unit, reference	P _{min.}	
01.6MDN1.6	±1.6 mbar	02.5MG0000	0 mbar to 2.5 mbar
02.5MDN2.5	±2.5 mbar	0004MG0000	0 mbar to 4 mbar
0004MDN004	±4 mbar	0006MG0000	0 mbar to 6 mbar
0006MDN006	±6 mbar	0010MG0000	0 mbar to 10 mbar
0010MDN010	±10 mbar	0016MG0000	0 bar to 16 mbar
0016MDN016	±16 mbar	0025MG0000	0 bar to 25 mbar
0025MDN025	±25 mbar	0040MG0000	0 bar to 40 mbar
0160LDN160	±160 Pa	0250LG0000	0 Pa to 250 Pa
0250LDN250	±250 Pa	0400LG0000	0 Pa to 400 Pa
0400LDN400	±400 Pa	0600LG0000	0 Pa to 600 Pa
0600LDN600	±600 Pa	0001KG0000	0 kPa to 1 kPa
0001KDN001	±1 kPa	01.6KG0000	0 kPa to 1.6 kPa
01.6KDN1.6	±1.6 kPa	02.5KG0000	0 kPa to 2.5 kPa
02.5KDN2.5	±2.5 kPa	0004KG0000	0 kPa to 4 kPa
00.5NDN0.5	±0.5 inH ₂ O	0001NG0000	0 inH ₂ O to 1 inH ₂ O
0001NDN001	±1 inH ₂ O	0002NG0000	0 inH ₂ O to 2 inH ₂ O
0002NDN002	±2 inH ₂ O	0005NG0000	0 inH ₂ O to 5 inH ₂ O
0005NDN005	±5 inH ₂ O	0009NGN.75	-0.75 inH ₂ O to 9 inH ₂ O
0010NDN010	±10 inH ₂ O	0010NG0000	0 inH ₂ O to 10 inH ₂ O
		0014NGN.40	-0.40 inH ₂ O to 14 inH ₂ O
		0020NG0000	0 inH ₂ O to 20 inH ₂ O

**⚠ 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.

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment 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 that Honeywell, in its sole discretion, 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. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility 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 writing. However, Honeywell assumes no responsibility for its use.

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