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Installation Instructions for the Basic Board Mount Pressure Sensors

Issue F

TBP Series, Compensated/Unamplified NBP Series, Uncompensated/Unamplified

50076346

60 mbar to 10 bar | 6 kPa to 1 MPa | 1 psi to 150 psi

GENERAL INFORMATION

Honeywell's Basic Board Mount Pressure Sensors: NBP Series, Uncompensated/Unamplified, and TBP Series, Compensated/Unamplified, are piezoresistive silicon pressure sensors designed for customers who require a simple, cost-effective, mV output, unamplified, high quality, high resolution solution for medical and industrial applications.

CAUTION

MEDIA INCOMPATIBILITY

- No gel coating option: The input port is limited to non-corrosive, non-ionic media such as dry air and gases and should not be exposed to condensation. The gases are limited to media that are compatible with the following wetted materials of construction: high temperature polyamide, silicone, epoxy, alumina ceramic, silicon, gold, and glass.
- Silicon gel coating option: The gel coated sensors use the same materials in the wetted media path but are protected from condensation by a silicone-based gel coating. The gel coating option allows use in applications where condensation can occur.

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

SOLDERING

See soldering times and temperatures in Table 1.

CAUTION

IMPROPER CLEANING

- 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.

Table 1. Absolute Maximum Ratings¹

Characteristic	Min.	Max.	Unit
Supply voltage (V _{supply}) ²	-12.0	12.0	Vdc
Storage temperature	-40 [-40]	125 [257]	°C [°F]
Soldering time and temperature:			
lead solder temperature (DIP)	4 s max. at 250 °C [482 °F]		
peak reflow temperature (Lead less SMT, SMT)	15 s max. at 250 °C [482 °F]		

1. Absolute maximum ratings are the extreme limits the device will withstand without damage.
2. Incorrect application of supply voltage or ground to the wrong pin may cause electrical failure.

Table 2. Operating Specifications

Characteristic	Min.	Typ.	Max.	Unit
Supply voltage (V _{supply}): ^{1,2}				
TBP Series	1.5	5.0	12.0	Vdc
NBP Series	1.8	5.0	12.0	
Supply current (at 5.0 Vdc supply):				
TBP Series	—	0.6	1.0	mA
NBP Series	—	1.5	2.5	
Operating temperature range ³	-40 [-40]	—	125 [257]	°C [°F]
Compensated temperature range ⁴ (TBP Series only)	0 [32]	—	85 [185]	°C [°F]
Input resistance (NBP Series only)	2.4	3.0	5.5	kOhm

1. Ratiometricity of the sensor (the ability of the device output to scale to the supply voltage) is achieved within the specified operating voltage.
2. Incorrect application of supply voltage or ground to the wrong pin may cause electrical failure.
3. Operating temperature range: The temperature range over which the sensor will produce an output proportional to pressure.
4. Compensated temperature range: The temperature range over which the sensor will produce an output proportional to pressure within the specified performance limits.

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Table 3. Environmental Specifications

Characteristic	Parameter
Humidity: all external surfaces internal surfaces of silicon gel coating option internal surfaces of no coating option	0 %RH to 95 %RH, non-condensing 0 %RH to 100 %RH, condensing 0 %RH to 95 %RH, non-condensing
Vibration	MIL-STD-202G, Method 204D, Condition B (15 g, 10 Hz to 2 kHz)
Shock	MIL-STD-202G, Method 213B, Condition C (100 g, 6 ms duration)
Life ¹	1 million pressure cycles min.
ESD: TBP Series NBP Series	MIL-STD 883 Method 3015.7, Class 1 MIL-STD 883 Method 3015.7, Class 3
Solder reflow	J-STD-020-D, MSL 1 (unlimited shelf life when stored at less than 30 °C and 85 %RH)

Notes:

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

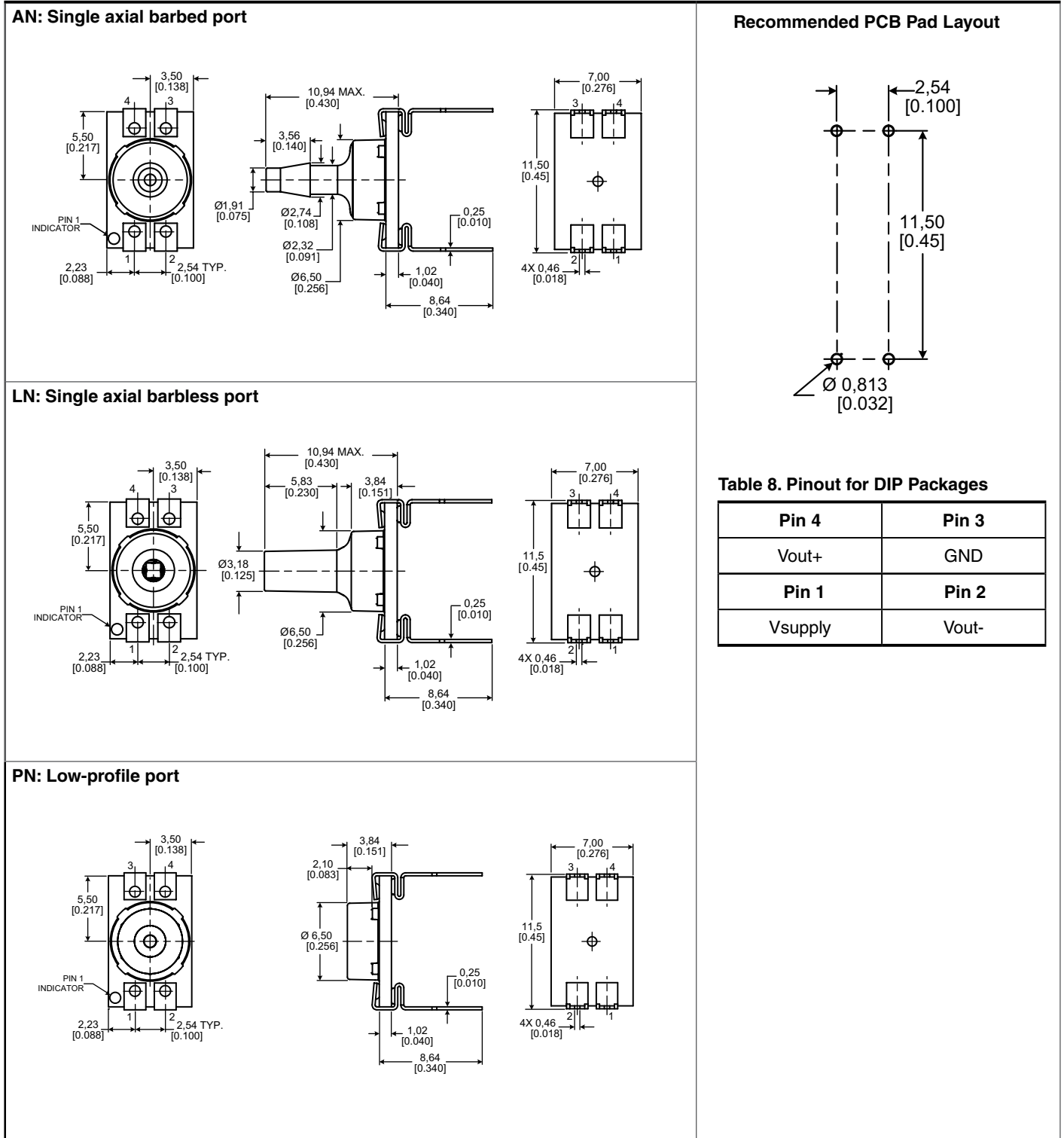
Table 4. Wetted Materials

Component	No Gel Coating Option	Silicon Gel Coating Option
Ports	high temperature polyamide	high temperature polyamide
Substrate	alumina ceramic	not exposed: protected by silicone gel
Adhesives	epoxy, RTV	epoxy
Electronic components	ceramic, silicon, gold, glass	not exposed: protected by silicone gel

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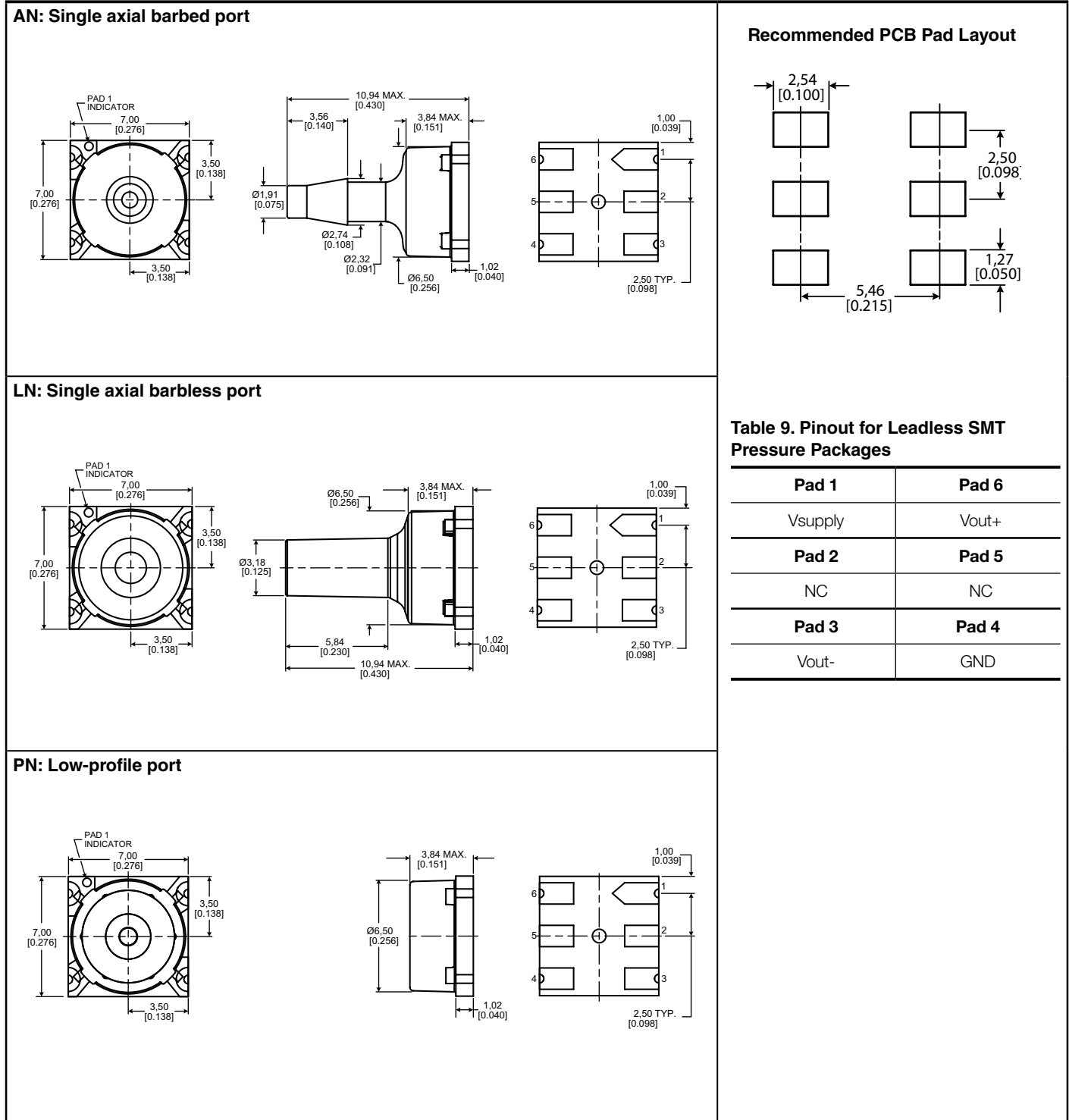
Figure 2. DIP Package Dimensional Drawings (For reference only: mm [in].)



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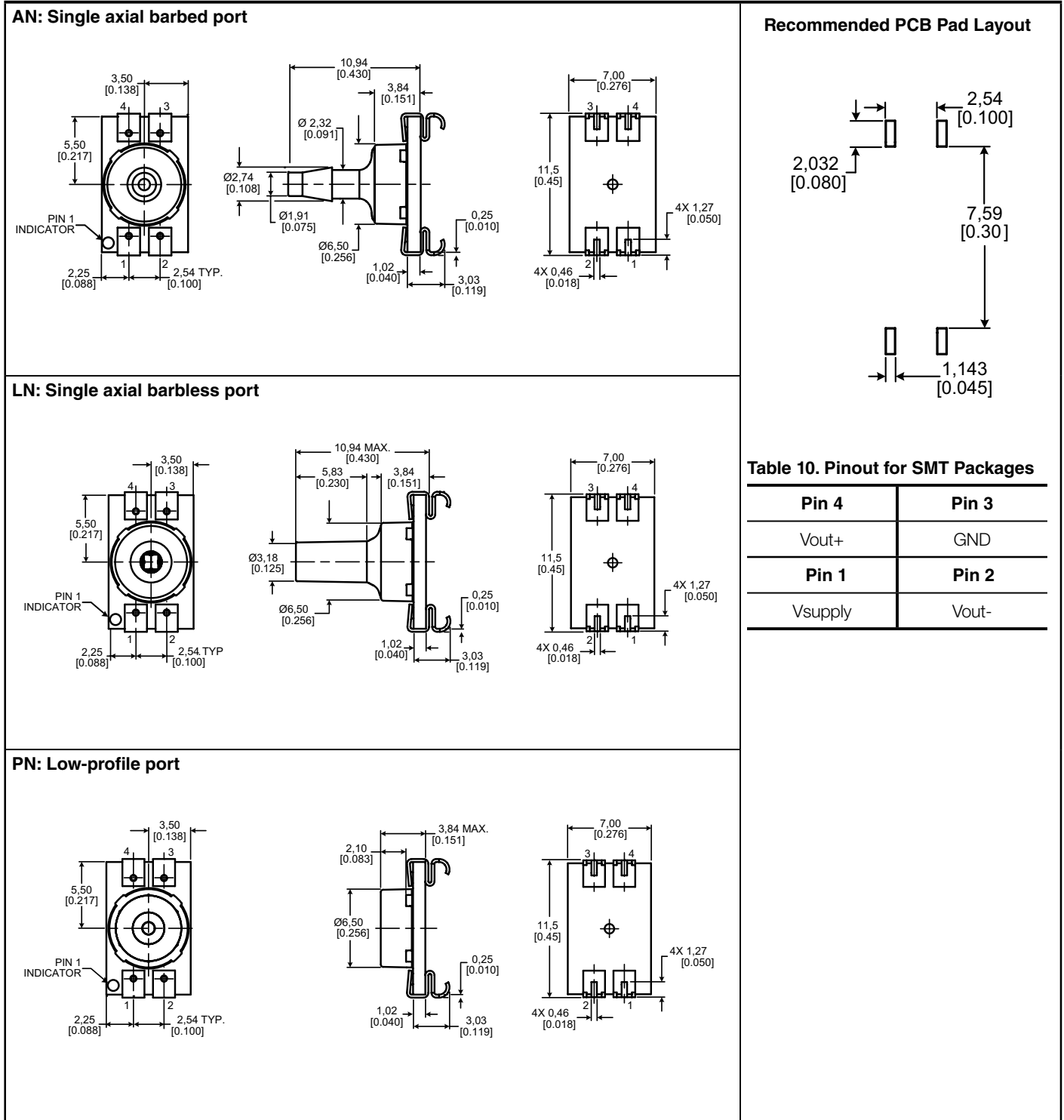
Figure 3. Leadless SMT Package Dimensional Drawings (For reference only: mm [in])



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Figure 4. SMT Package Dimensional Drawings (For reference only: mm [in])

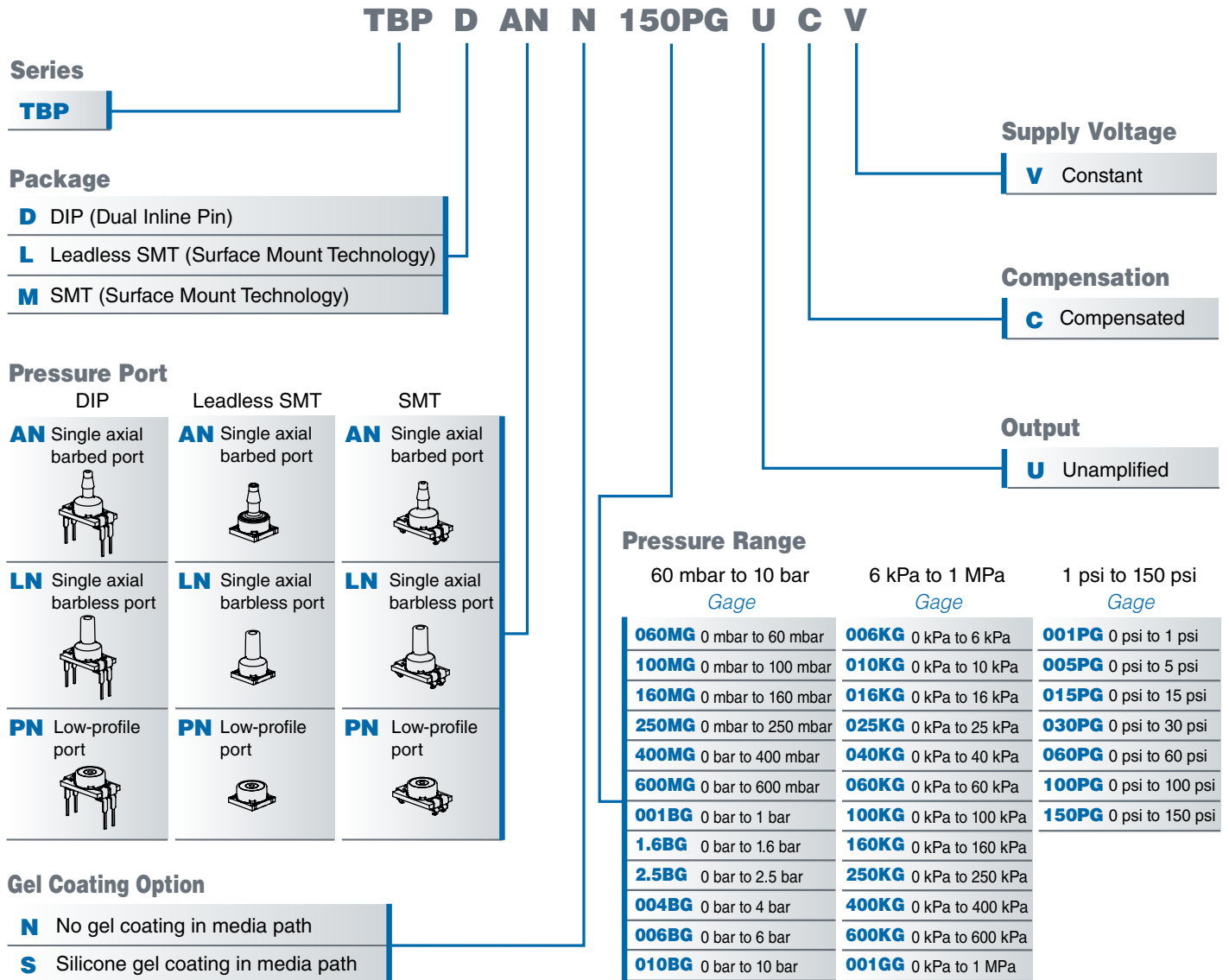


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Figure 5. TBP Series Nomenclature and Order Guide

For example, **TBPDANN150PGUCV** defines a TBP Series Basic Board Mount Pressure Sensor, DIP package, AN pressure port, no gel coating in media path, 150 psi gage pressure range, unamplified, compensated, constant supply voltage.

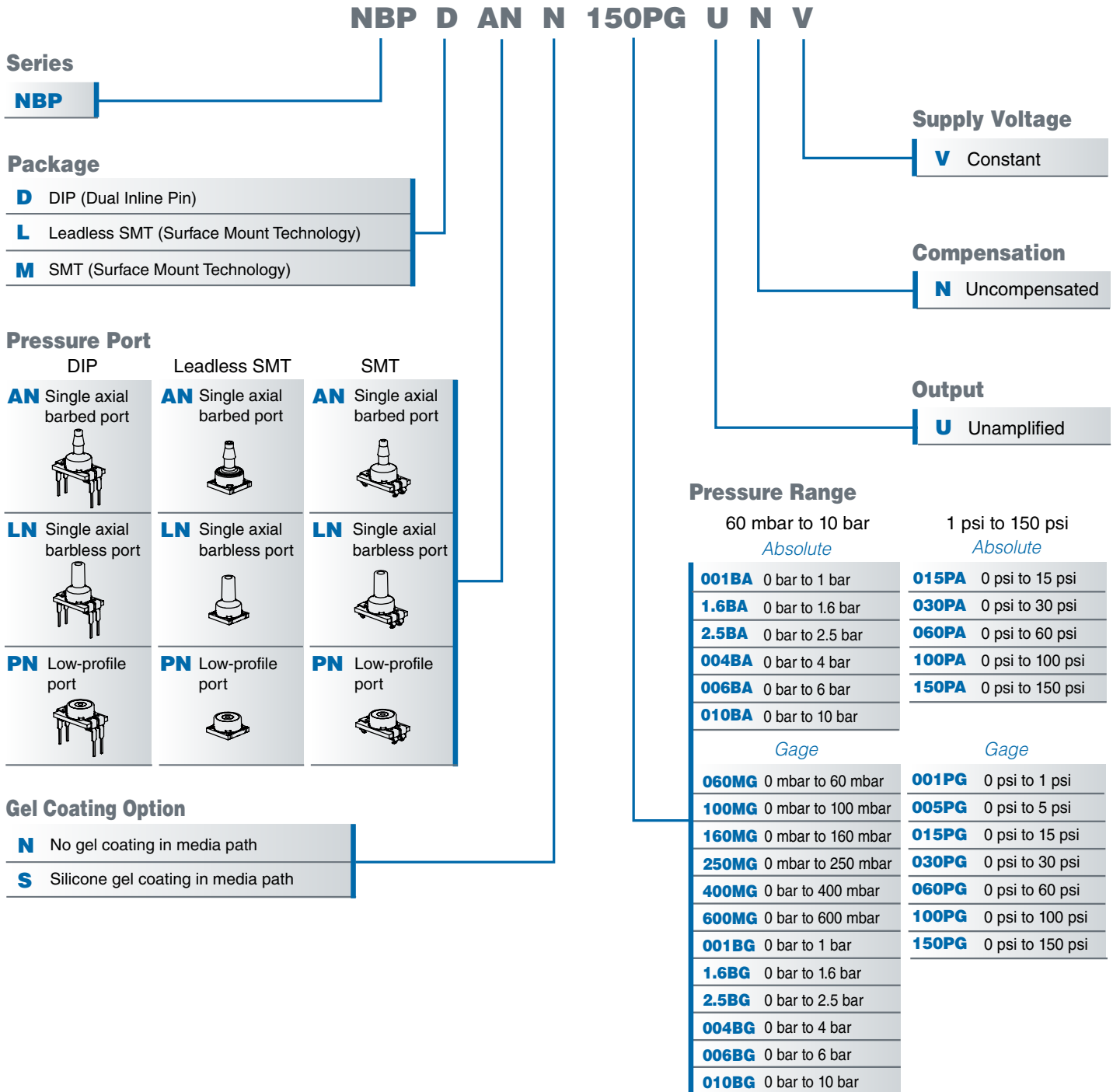


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Figure 6. NBP Series Nomenclature and Order Guide

For example, **NBPDANN150PGUNV** defines an NBP Series Basic Board Mount Pressure Sensor, DIP package, AN pressure port, no gel coating in media path, 150 psi gage pressure range, unamplified, uncompensated, constant supply voltage.



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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

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.

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