



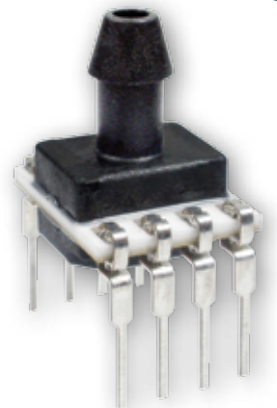
TruStability® Board Mount Pressure Sensors

TSC Series, Compensated/Unamplified

±60 mbar to ±10 bar | ±6 kPa to ±1 MPa | ±1 psi to ±150 psi
Millivolt Analog Output

NSC Series, Uncompensated/Unamplified

±2.5 mbar to ±10 bar | ±250 Pa to ±1 MPa | ±1 inH₂O to ±150 psi
Millivolt Analog Output



TruStability® Board Mount Pressure Sensors

Honeywell's TruStability® TSC Series and NSC Series are piezoresistive silicon pressure sensors offering a ratiometric analog output for reading pressure over the specified full scale pressure span and temperature range.

TSC Series:

- Temperature compensated and unamplified.
- Compensation makes it easier to integrate the sensor into a system by eliminating the need to calibrate the system over temperature and also offers reduced part-to-part variation.
- Compensated temperature range is 0 °C to 85 °C [-32 °F to 185 °F].
- Operating temperature range is -40 °C to 85 °C [-40 °F to 185 °F].
- Measures differential or gage pressures

NSC Series:

- Uncompensated and unamplified.
- Allows customers the flexibility of performing their own calibration while still benefiting from the industry-leading stability, accuracy, and repeatability that the Honeywell TruStability® Pressure Sensors provide.
- Operates as specified from -40 °C to 85 °C [-40 °F to 185 °F].
- Measures absolute, differential or gage pressures.

The absolute versions have an internal vacuum reference and an output value proportional to absolute pressure. Differential versions allow measurement of pressure between two pressure ports. Gage versions are referenced to atmospheric pressure and provide an output proportional to pressure variations from atmosphere.

The TSC Series and NSC Series sensors are intended for use with non-corrosive, non-ionic gases, such as air. Port 1 can also be used for non-corrosive, non-ionic liquids on sensors rated above 60 mbar | 6 kPa | 1 psi.

The TSC and NSC Series offer numerous package styles and mounting options, making it easier for device manufacturers to integrate the product into their applications. These sensors offer infinite resolution on the pressure signal. Frequency response is also typically limited only by the end user's system. All products are designed and manufactured according to ISO 9001.

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What makes our sensors better?

- Stability and reliability you can count on
- Industry-leading accuracy down to ±0.15 %FSS BFS
- Port and housing options simplify integration
- Wide pressure range from ±2.5 mbar to ±10 bar | ±250 Pa to ±1 MPa | ±1 inH₂O to ±150 psi
- Small package size
- Low power consumption

STABILITY • ACCURACY • FLEXIBILITY • SMALL SIZE

Features and Benefits

INDUSTRY-LEADING LONG-TERM STABILITY

Even after long-term use and thermal extremes, these sensors perform substantially better relative to stability than any other pressure sensor available in the industry today:

- Minimizes system calibration needs and maximizes system performance.
- Helps support system uptime by eliminating the need to service or replace the sensor during its application life.

INDUSTRY-LEADING ACCURACY

Extremely tight accuracy down to ± 0.15 %FSS BFSI:

- Reduces software needed to correct system inaccuracies, minimizing system design time.
- Supports system accuracy and warranty requirements.

Minimizes system calibration and design needs; supports system uptime.

INDUSTRY-LEADING FLEXIBILITY

- Modular, flexible design with numerous package styles, pressure ports, and options simplifies integration into the device manufacturer's application.
- Single side wet media allows the end customer to use one port of the sensor with condensing humidity or directly with non-corrosive liquid media.

Simplifies product integration.

INSENSITIVE TO MOUNTING ORIENTATION

Allows flexibility of use within the application.

SMALL SIZE

Miniature 10 mm x 10 mm [0.39 in x 0.39 in] package is very small when compared to most board mount pressure sensors:

- Occupies less area on the PCB.
- Typically allows for easy placement on crowded PCBs or in small devices.

REPEATABILITY

Provides **excellent repeatability, high accuracy and reliability** under many demanding conditions.

SUPPORTS LEAN MANUFACTURING

- J-STD-020-D MSL 1 unlimited shelf life after packaging is opened.
- System can be calibrated within one hour after reflow solder.
- Compatible with modern lead-free and no-clean solder processes.

Features and Benefits

EXTREMELY LOW POWER CONSUMPTION

- Operating supply voltage as low as 1.5 Vdc.
- Reduces power consumption, provides extended battery life, and promotes energy efficiency.

ABSOLUTE, DIFFERENTIAL AND GAGE TYPES

- Provides flexibility of use within the application.
- Absolute type on NSC Series only.

PRESSURE RANGES FROM ± 2.5 MBAR TO ± 10 BAR | ± 250 PA TO ± 1 MPA | ± 1 INH₂O TO ± 150 PSI

Optimizes the customer's system performance by maximizing pressure resolution with more available pressure ranges.

ROHS AND ISO9001 COMPLIANCE

Potential Applications



MEDICAL

- NEBULIZERS
- SPIROMETERS
- PATIENT MONITORING EQUIPMENT
- THERAPEUTIC HOSPITAL BEDS
- HOSPITAL GAS SUPPLY
- OXYGEN CONCENTRATORS
- BLOOD ANALYSIS
- GAS CHROMATOGRAPHY
- ANALYTICAL INSTRUMENTS



INDUSTRIAL

- VALVES
- PUMPS
- ACTUATORS
- HVAC TRANSMITTERS
- AUTOMATED PNEUMATIC ASSEMBLY EQUIPMENT
- PNEUMATIC OPERATOR CONTROL SYSTEMS
- INDUSTRIAL GAS SUPPLY
- BAROMETRY
- GAS CHROMATOGRAPHY
- ANALYTICAL INSTRUMENT SAMPLING SYSTEMS



TSC Series and NSC Series General Specifications

Table 1. Absolute Maximum Ratings¹

Characteristic	Min.	Max.	Unit
Supply voltage (V_{supply}) ² : pressure ranges ≥ 60 mbar 6 kPa 1 psi pressure ranges ≤ 40 mbar 4 kPa 20 inH ₂ O	-12.0 0	12.0 7	Vdc
Storage temperature	-40 [-40]	85 [185]	°C [°F]
Soldering time and temperature: lead solder temperature (SIP, DIP) peak reflow temperature (SMT)	4 s max. at 250 °C [482 °F] 15 s max. at 250 °C [482 °F]		

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

²Incorrect 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} : pressure ranges ≥ 60 mbar 6 kPa 1 psi pressure ranges ≤ 40 mbar 4 kPa 20 H ₂ O	1.5 2.7	5.0 5.0	12.0 6.5	Vdc
Supply current (at 5.0 Vdc supply) TSC Series NSC Series	— —	0.6 1.5	1 2.2	mA
Operating temperature range ³	-40 [-40]	—	85 [185]	°C [°F]
TSC Series compensated temperature range ⁴	0 [32]	—	85 [185]	°C [°F]
Startup time	—	—	5	ms
TSC Series output resistance	—	2.5	—	kOhm

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

²Incorrect application of supply voltage or ground to the wrong pin may cause electrical failure.

³Operating temperature range: The temperature range over which the sensor will produce an output proportional to pressure.

⁴Compensated temperature range: The temperature range over which the sensor will produce an output proportional to pressure within the specified performance limits.

Table 3. Environmental Specifications

Characteristic	Parameter
Humidity	0% 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 minimum
Solder reflow	J-STD-020-D MSL1 (unlimited shelf life when stored at less than 30 °C and 85 %RH)

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

TSC Series and NSC Series General Specifications

Table 4. Wetted Materials¹

Component	Port 1 (Pressure Port)	Port 2 (Reference Port)
Ports and covers	high temperature polyamide	high temperature polyamide
Substrate	alumina ceramic	alumina ceramic
Adhesives	epoxy, RTV	epoxy, RTV
Electronic components	silicon	silicon, glass, gold

¹Contact Honeywell Customer Service for detailed material information.

CAUTION

PRODUCT DAMAGE

- 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. Non-compatible liquid media will degrade sensor performance and may lead to sensor failure.

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

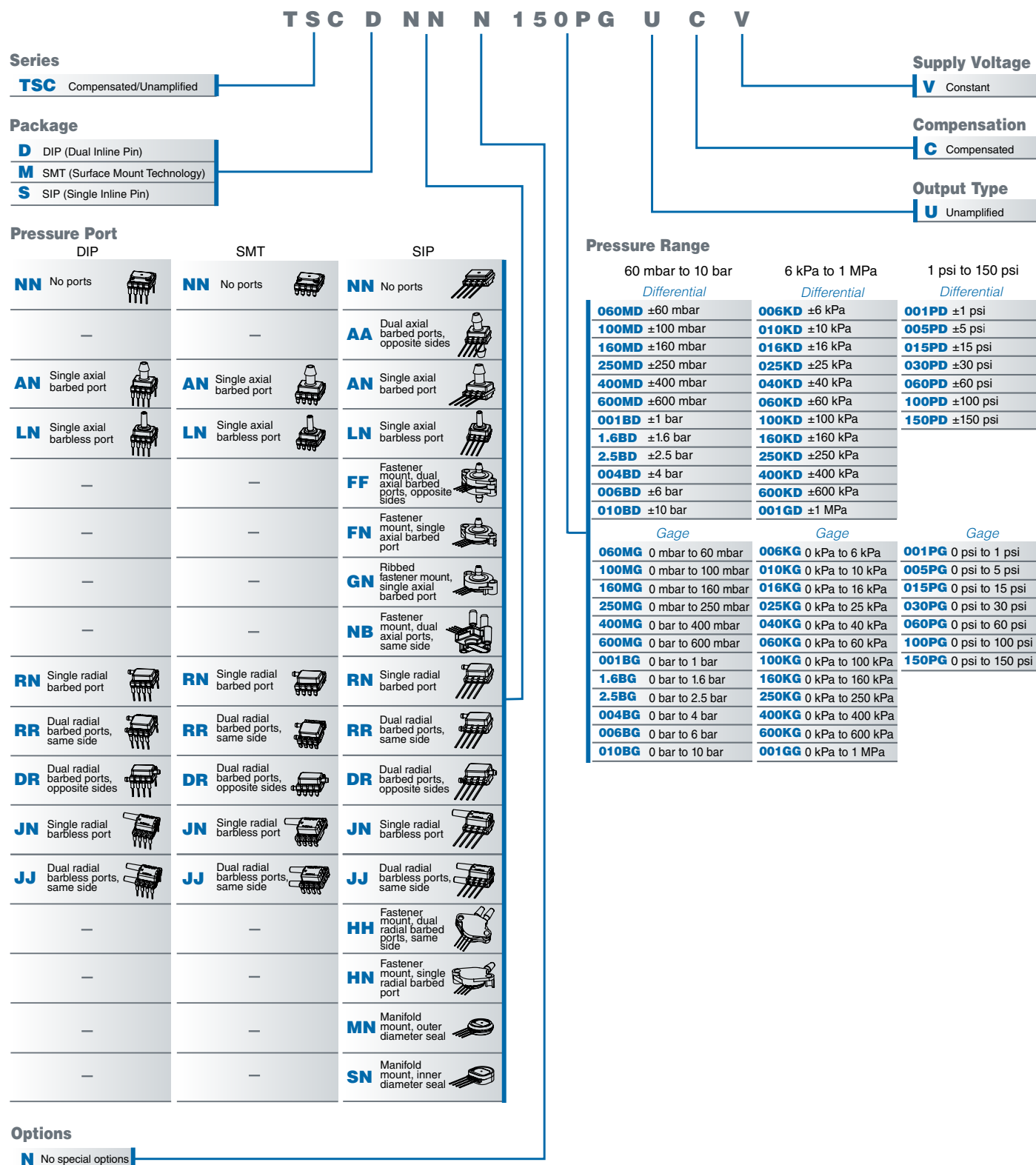
Table 5. Sensor Pressure Types

Pressure Type	Description
Absolute	Output is proportional to the difference between applied pressure and a built-in reference to vacuum.
Differential	Output is proportional to the difference between the pressures applied to each port (Port 1 – Port 2).
Gage	Output is proportional to the difference between applied pressure and atmospheric (ambient) pressure.

TSC Series Nomenclature and Order Guide

Figure 1. TSC Series Nomenclature and Order Guide¹

For example, **TSCDNNN150PGUCV** defines a TSC Series TruStability® Pressure Sensor, DIP package, NN pressure port, no special options, 150 psi gage pressure range, unamplified, compensated, constant supply voltage.



¹See Table 5 for an explanation of sensor pressure types.

