

ROSEMOUNT SPECIFICATIONS

Model 3051 Digital Pressure Transmitter

00815-0100-4001
English
Rev. AB

1. EQUIPMENT DESCRIPTION

- Two-wire, capacitance (DP/GP) or piezoresistive (AP/GP), high-performance differential/gage/absolute/level/flow pressure transmitter with HART[®] based or FOUNDATION[™] fieldbus based digital communication capabilities.
- Small, lightweight Coplanar[™] design.

2. REFERENCES

- Material supplied under this specification shall be in conformance with:
 - National Electric Code (NFPA 70) 501-5 by incorporating a two-compartment electronics housing for separation of the process medium and the electrical conduit.
 - National Electrical Manufacturer's Association (NEMA) standard number ICS6 "Enclosure for industrial controls and systems," 4X.
 - IP65 or IP68, depending on installation conditions.
 - Factory Mutual (FM), Canadian Standards Association (CSA), CENELEC, and SAA standards for explosion-proof enclosure and intrinsically safe electronic circuitry.
 - Japanese Industrial Standard (JIS) for flameproof enclosure.
 - CE mark per European Standards EN 50081-1, EN 50082-1, EN 50082-2
- Manufacturer must be certified as meeting the requirements of ISO 9001.

3. ENVIRONMENTAL CONDITIONS

- The instrument selected shall be suitable for the following conditions:
 - Humidity: 0–100% relative humidity.
 - Ambient Temperature Limits: –40 to 185 °F (–40 to 85 °C).
- Transmitter shall have a dual-compartment housing with a moisture barrier completely isolating the electronic circuitry from the field wiring and calibration terminals.

4. PROCESS CONDITIONS

- Suitable for liquid, gas, and vapor service.
 - Process Temperature Limits:
 - Silicone fill: –40 to 250 °F (–40 to 121 °C) with Coplanar flange.
 - –40 to 300 °F (–40 to 149 °C) with traditional flange.
 - Inert fill, above atmospheric pressure: 0 to 185 °F (–18 to 85 °C).
 - Overpressure Limits (Models 3051CD and 3051CG)*:
 - 0 psia to 4,500 psig (31 MPa).
 - 0 psia to 2,000 psig (13.8 MPa) for 0.5 to 2.5 inH₂O (0.12 to 0.62 kPa).
- * See PDS 00813-0100-4001 for Model 3051T and 3051CA overpressure limits.*
- Line Pressure Limits (Model 3051CD):
 - 0.5 psia to 4,500 psig (3.5 kPa abs. to 31 MPa). **4,500 psig (31 MPa) optional for Ranges 2–5 (see Section 12).
 - 0.5 psia to 2,000 psig (3.5 kPa abs. to 13.8 MPa) for spans of 0.5 to 2.5 inH₂O (0.12 to 0.62 kPa).

5. ELECTRICAL

- Transmitter shall be certified for use in hazardous areas by a recognized authority, such as Factory Mutual.
- Electrical connections shall include a choice of: ½–14 NPT, M20 x 1.5 (CM20), PG 13.5, or G½ conduit.

6. POWER SUPPLY

- Transmitter shall operate on 10.5 to 55 V dc, with no load (6–12 V dc with no load for low power).

7. MEASUREMENT RANGES

	Minimum Span	Maximum Span
Differential	0.1 inH ₂ O (0.25 kPa)	2,000 psig (13.8 MPa)
Gage	2.5 inH ₂ O (0.62 kPa)	10,000 psig (70.0 MPa)
Absolute	0.339 inHg (8.61 mmHg)	10,000 psig (70.0 MPa)
Liquid Level	2.5 inH ₂ O (0.62 kPa)	8,310 inH ₂ O (2068 kPa)
Remote Seals	2.5 inH ₂ O (0.62 kPa)	2,000 psig (13.8 MPa)

8. OUTPUTS

- Outputs shall be a 4–20 mA analog signal (1–5 V dc or 0.8–3.2 V dc for low power), user-selectable linear or square root, with a superimposed digital signal, using HART Protocol.
- Analog output shall be adjustable remotely with a field communicator or control system. Zero and span adjustments shall also be available on the transmitter.

9. DATA STORAGE

- Transmitter data shall be stored in nonvolatile EEPROM memory.
- Sensor module characterization data shall be an integral part of the sensor module.

10. SOFTWARE FUNCTIONALITY

- Transmitter shall be capable of digital communication over the 4–20 mA output loop without disruption, using the HART Communications Protocol.
- The transmitter shall perform continuous diagnostics, capable of self-test functions and be able to provide specific diagnostic information locally on the meter and remotely.
- The configuration capabilities of the transmitter shall allow the user the ability to input and store information including the range, engineering units, damping, square root or linear output, drain/vent valves, flange, and O-ring materials, date, message, descriptor, tag number, serial number, and remote seal information.
- Process variable and sensor module temperature information shall be available digitally.
- Transmitter software security shall be user selectable.
- Upscale/Downscale failure mode shall be user selectable.

11. PERFORMANCE

- The transmitter shall meet the following performance criteria as a minimum:
 - **Specification Conformance:**
The Model 3051 Family maintains a specification conformance of at least 3σ .
 - **Total Performance [over ± 50 °F (28°C), 1,000 psi (6.9 MPa) line pressure]:**
 $\pm 0.15\%$ of span (Models 3051CD, 3051CG, 3051T, 3051CA).
 $\pm 0.10\%$ of span (Model 3051P Reference Class).
 - **Stability [over ± 50 °F (28°C), 1,000 psi (6.9 MPa) line pressure]:**
 $\pm 0.125\%$ of URL for 5 years.
 $\pm 0.1\%$ of URL for 12 months (Models 3051T and 3051CA Ranges 1–5).
 $\pm 0.2\%$ of URL for 12 months (Models 3051CD Range 1, 3051CA Range 0).
 - **Accuracy:**
 $\pm 0.075\%$ of Calibrated Span (Standard Model 3051).
 $\pm 0.05\%$ of Calibrated Span (Model 3051P Reference Class).
 - **Total Ambient Temperature Effect per 50 °F (28 °C):**
 $\pm(0.0125\%$ URL + 0.0625% span) spans from 1:1 to 30:1 (Standard Model 3051).
 $\pm(0.006\%$ URL + 0.03% span) spans from 1:1 to 10:1 (Model 3051P Reference Class).
 $\pm(0.025\%$ URL + 0.125% span) spans from 1:1 to 30:1 (Models 3051T and 3051CA).
 - **Static Pressure Effects per 1,000 psi (6.9 MPa) for Differential only:**
Zero: $\pm 0.05\%$ of URL which can be calibrated out (Standard Model 3051).
 $\pm 0.04\%$ of URL which can be calibrated out (Model 3051P Reference Class).
Span: $\pm 0.1\%$ of Reading (Standard Model 3051).
 $\pm 0.1\%$ of Reading (Model 3051P Reference Class).
 - **Time Response:**
Dead Time (T_d): 45 milliseconds (nominal)
Time Constant (T_c): 55 milliseconds
Update Rate: 20 times per second (minimum)
 - **Vibration Effect:**
 $\pm 0.1\%$ of URL when tested from 15 to 2,000 Hz per SAMA PMC 31.1.
 - **RFI Effect:** less than $\pm 0.1\%$ of span from 20 to 1,000 MHz for field strength of 30 V/m per IEC 801-3.

12. OPTIONS

- The following optional equipment shall be available:
 - Digital LCD indicator with diagnostic capabilities.
 - Model 305/306 Integral Manifold.
 - Remote diaphragm seals.
 - 4,500 psi (31.0 MPa) line pressure.
 - Worldwide hazardous locations certifications.
 - FOUNDATION fieldbus
 - High temperature (375 °F [191 °C]).
 - Mounting brackets.
 - Stainless steel housing.
 - Level flanges.
 - Low power electronics.
 - Factory-assembled primary elements

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