

ROSEMOUNT SPECIFICATIONS

Model 1151 Pressure Transmitter Family

1. EQUIPMENT DESCRIPTION

- Two-wire, capacitance-based analog pressure transmitters with the capability of measuring:
 - Differential pressure
 - Gage/Absolute pressure
 - Draft pressure
 - Liquid level
- Smart option—HART® based digital communication capabilities.

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.
 - 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 explosion-proof enclosure.
- 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:
 - Smart: –40 to 185 °F (–40 to 85 °C).
 - Analog Output Code E: –40 to 200 °F (–40 to 93 °C).
 - Analog Others: –20 to 200 °F (–29 to 93 °C).
- Transmitter shall have a dual-compartment housing with a moisture barrier totally 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 220 °F (–40 to 104 °C)
 - Inert fill: 0 to 160 °F (–18 to 71 °C)
- Pressure Limits:
 - DP/AP: 2,000 psig (13.8 MPa) maximum.
 - HP: 4,500 psig (31 MPa) maximum.
 - GP: 6,000 psig (41.3 MPa) maximum.
 - LT: To flange rating or 2,000 psia (13.8 MPa), whichever is less.
 - DR: 1,000 psig maximum (6.9 MPa).

5. ELECTRICAL

- Transmitter shall be certified for use in hazardous areas by a recognized authority such as Factory Mutual.
- Electrical connections shall be ½–14 NPT conduit.
- Transmitter is factory sealed; conduit seal not required to meet FM Explosion-Proof requirements.

6. POWER SUPPLY

- Transmitter shall operate on:
 - 12 to 45 V dc, with no load for 4–20 mA dc output.
 - 30 to 85 V dc for 10–50 mA dc output.
 - 8 to 12 V dc for 1–5 V dc low power output.
 - 5 to 12 V dc for 0.8–3.2 V dc low power output.

7. RANGES

- Ranges shall be available as follows:

	Minimum Span (Smart)	Minimum Span (Analog)	Maximum Span (Analog and Smart)
DP	2 inH ₂ O (0.5 kPa)	5 inH ₂ O (1.24 kPa)	1,000 psi (6895 kPa)
HP	10 inH ₂ O (2.48 kPa)	25 inH ₂ O (6.22 kPa)	300 psi (2.068 kPa)
DR	Not Applicable	0.5 inH ₂ O (0.124 kPa)	6 in H ₂ O (1.43 kPa)
GP	2 inH ₂ O (0.5 kPa)	5 inH ₂ O (1.24 kPa)	6,000 psig (41.37 MPa)
AP	10 inH ₂ O (2.48 kPa)	25 inH ₂ O (6.22 kPa)	1,000 psia (6895 kPa)
LT	15 inH ₂ O (3.7 kPa)	25 inH ₂ O (6.22 kPa)	2,770 in H ₂ O (689.5 kPa)

8. OUTPUTS

- Outputs shall be available as follows:

- 4–20 mA + HART (Smart Option) User selectable linear or square root with a superimposed HART digital signal.
- 4–20 mA only linear.
- 10–50 mA linear.
- 0.8–3.2 V 3-wire, low power, linear.
- 1–5 V 3-wire, low power, linear.
- 4–20 mA square root of input between 4–100% of input, linear with input between 0–4% of input.
- Span and zero adjustments shall be available on the transmitter.
- With the smart option, analog output shall be adjustable remotely using a field communicator or a control system.

9. PERFORMANCE

- The transmitter shall meet the following performance criteria as a minimum:

- Accuracy (% Calibrated Span):

	DP, GP, and HP up to Range 1000 psi (6895 kPa)		All Other
Calibrated Span	2 to 3 inH ₂ O (0.5 to 0.75 kPa)	3 inH ₂ O to 1,000 psi (0.75 to 6895 kPa)	
Smart Model 1151	$\pm\left(\frac{0.6}{\text{span inH}_2\text{O}} - 0.1\right)$	±0.1	±0.25
Calibrated Span	DP up to Range 750 inH ₂ O (186.4 kPa)		DR
Analog Model 1151	±0.2		±0.5
			All Other
			±0.25

- Static Pressure Effect:

Calibrated Span	DP up to Range 30 in H ₂ O (7.46 kPa)	Other DP	HP
Zero (% URL)	±0.50 for 2,000 psi (13.8 MPa)	±0.25 for 2,000 psi (13.8 MPa)	±2 for 4,500 psi (31 MPa)
Span (% Reading)	±0.50 for 1,000 psi (6.9 MPa)	±0.25 for 1,000 psi (6.9 MPa)	±0.25 for 1,000 psi (6.9 MPa)

- Stability (% URL for six months):

Calibrated Span	DP and GP up to Range 1000 psi (6895 kPa)		All Other
Smart Model 1151	±0.1		±0.25
Calibrated Span	DP up to Range 750 inH ₂ O (186.4 kPa)		DR
Analog Model 1151	±0.2		±0.5
			All Other
			±0.25

- Total Ambient Temperature Effect (% of Span per 100 °F [55 °C] at Maximum Span):

Calibrated Span	DP and GP up to Range 30 inH ₂ O (7.46 kPa)	DP, GP, and HP Range 150 inH ₂ O to 1,000 psi (31.08 to 6895 kPa)	LT	DR	All Other
Smart Model 1151	0.76	0.38	1.5	NA	1
Analog Model 1151	2	1	1.5	1.5 per 50 °F (28 °C)	1

- Vibration Effect: ±0.05% of URL per g to 200 Hz in any axis.

10. DATA STORAGE (for Smart only)

- Transmitter data shall be stored in a nonvolatile EEPROM memory.
- Data integrity shall be protected by an 8-bit checksum.
- Message integrity shall be verified by vertical and longitudinal parity checks.

11. SOFTWARE FUNCTIONALITY (for Smart only)

- Transmitter shall be capable of simultaneous communication over the 4–20 mA output signal using HART Protocol.
- The transmitter shall perform continuous diagnostics, be capable of self-test functions and be able to give specific diagnostic information.
- The configuration capabilities of the transmitter shall allow the user the ability to input and store information including range, engineering units, damping, square root or linear output, vent, flange, and O-ring materials, date, message, descriptor, tag number, and remote seal information.
- Process variable information shall be available digitally.

12. OPTIONS

- The following options shall be available:
 - Remote diaphragm seals
 - Indicating meter
 - Brackets

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