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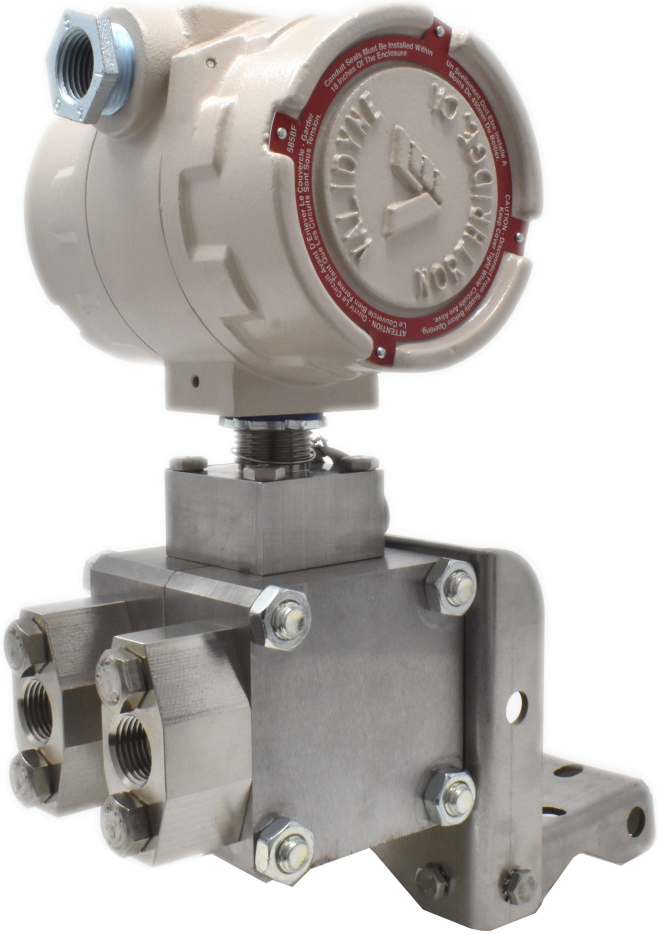
Product Data Sheet
N-DR800 Draft Range Pressure Transmitter



N-DR800 Series Draft Range Differential Pressure Transmitter

Model N-DR800 Draft Range Transmitter is a nuclear qualified analog loop powered transmitter for very low-pressure measurement. It has a full-scale range as low as ±0.25” H2O, making it ideal for air flow control applications. It can be turned down to ±0.1” H2O; higher full-scale ranges to ±100” H2O are available. The DR800 offers 0.5% accuracy and an operating temperature range of -20°F to +185°F. The total combined temperature effects are less than 3%/100°F.

Nuclear Power Plant Applications

The model N-DR800 has many outstanding features which make it the perfect transmitter for very low pressure measurements such as: HEPA vent filter, HEPA filter discharge flow, control room air, containment pressure, scrubber/pre-concentrator demister, rad waste evaporator, vent stack monitoring, turbine building DP, main chimney flow, and other low range pressure monitoring

applications.

Replacement for obsolete draft range transmitters including these discontinued models

- Ametek Gulton-Statham DR 3200
- Prime 340D (Cameron, Barton, Moore Products)
- Rosemount™ 1151DR Draft Range
- Tobar 56DR Draft Range
- KDG Mobrey (Emerson, Delta) Series 4000 Draft Range

Features

- Fully Analog, loop powered, 4-20 mA
- Operates from 12 to 45 VDC terminal voltage
- Nuclear Grade (CGD/OEM)
- IEEE 344 Seismic/mild environment
- Designed for Electromagnetic Compatibility with other nuclear plant I&C
- EMC per NRC RG1.180
- Wetted parts traceability
- Full Range as low as 0.25” H2O without Turndown or Amplification
- Low Ambient Temperature Effects Improve Very Low Measurements
- Selectable Resolution on Zero and Span Adjustments Ease Critical Calibrations
- Sensor body and wetted parts made from 410 SST for corrosion resistance

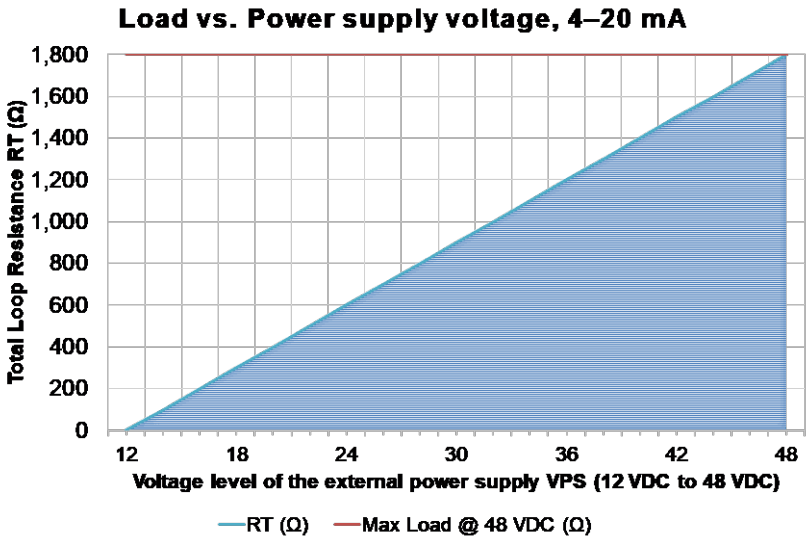
We are ready to help you select the right product for your application.

Connect with us today Request Sales Support

Electrical

- Two-wire loop powered 4-20 mA
- Wide power input range of 12 to 48 VDC (see Power Supply / Load Curve)
- Reverse polarity and short circuit protection
- Selectable damping with user selectable time constant from 0.25 to 8 seconds
- External zero and span adjustment potentiometers

Power Supply / Load Curve



VPS = (.02 x RT) +12 Where:
VPS = Power Supply Voltage
RT = Total Loop Resistance
.02 = Full Scale Current (Amps)
12 = VDC Min. Terminal Volts

Construction

- Gasketed, threaded covers on the electrical enclosures (NEMA 4 enclosure).
- Dual electrical cavities in the electrical housing keep field wiring separate from the electrical compartment.
- ¼" NPT female pressure connections on 2.125" centers
- Pressure connections on front and rear
- Sensor body and wetted parts made from 410 SST
- IEEE 344 Seismic qualified stainless-steel mounting bracket

Nuclear Specifications

IEEE 323/344 Class 1E Mild Environment where seismic is the only design basis event (DBE) of consequence: Seismic qualification envelopes the Generic Seismic Profile per EPRI TR-107330 Figure 4-5 with 5% damping horizontal and vertical. EMC Compliance to USNRC RG 1.180.

Reference Standards & Specifications

1. IEEE Std. 323-1974/1983/2003, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations," The Institute of Electrical and Electronics Engineers, Inc.
2. IEEE Std. 344-1975/1987/2004, "IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," The Institute of Electrical and Electronic Engineers, Inc.
3. EPRI TR-107330, "Generic Requirements Specification for Qualifying a Commercially Available PLC for Safety-Related Applications in Nuclear Power Plants," EPRI, December 1996.
4. MIL-HDBK-217F, Military Handbook: Reliability Prediction of Electronic Equipment

Reliability

Reliability calculations indicate a 95.3% probability that these transmitters will operate for 40 years at 25°C without failure. The test program verified that the specimens can meet or exceed their performance requirements in mild environment applications under normal, abnormal, operational basis event and safe shutdown event conditions.

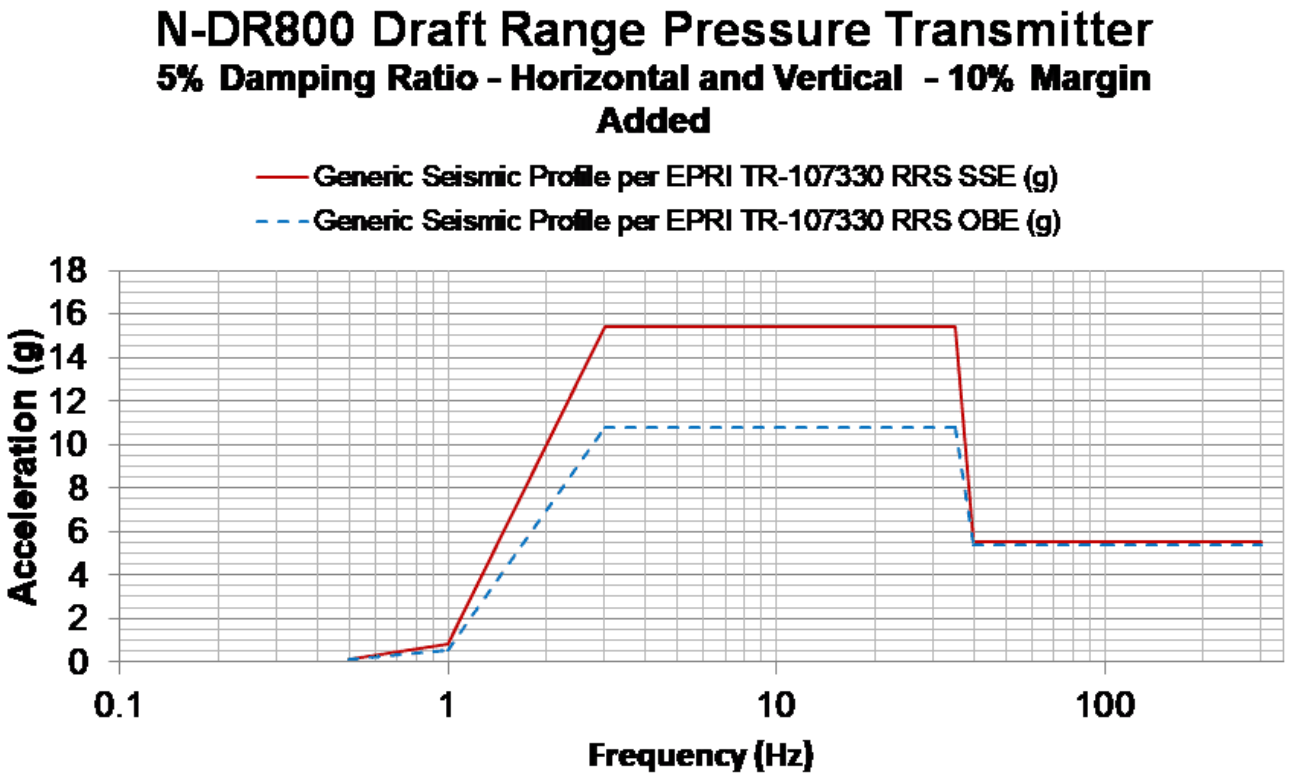
MIL-HDBK-217F MTBF & Failure Rate

- 25°C (77°F) MTBF 7,274,526 hours (830.4 years); Failure Rate FIT 137.5 (10^9 hours)
- 40°C (104°F) MTBF 5,378,455 hours (614.0 years); Failure Rate FIT 185.9 (10^9 hours)

Quality Assurance and Certification of Origin

Ultra is a value-added reseller of Model N-DR800 under an OEM/VAR agreement with Validyne Engineering located in Northridge CA. The EMC protection circuitry has been designed and tested by Ultra to comply with US NRC Reg. Guide 1.180 (IEC 61000 Series options). Ultra performs commercial grade dedication under its 10CFR50 App. B QA program and owns the IEEE 323/344 Class 1E qualification. Ultra is the exclusive channel to market for N-DR800. This product is designed and manufactured in U.S.A.

Seismic Qualification



Test levels from EPRI TR-107330, Figure 4-5 (1996 corrected edition.) During the Seismic test the output remained within ≤ ± 18 mV disturbance, which is less than the ±0.5% reference accuracy. The N-DR800 output before, during and after OBE and SSE remained within the ±0.5% of URL.

Model Matrix/ Ordering Information

See Documents

Dimensional Drawing

See Documents

Mounting Bracket Drawing

See Documents

Specifications

NAME	DESCRIPTION
Functional Specifications	Description
Type	Draft Range Differential Pressure Transmitter
DP Ranges	Upper Range Limit
P25	± 0.25 inH2O, 0.6225 mbar, 62.16 Pa
P50	± 0.5 inH2O, 1.245 mbar, 124.3 Pa
1P0	± 1 inH2O, 2.49 mbar, 248.6 Pa
2P5	± 2.5 inH2O, 6.225 mbar, 622 Pa
5P0	± 5 inH2O, 12.45 mbar, 1,243 Pa
10P	± 10 inH2O, 24.9 mbar, 2,486 Pa
25P	± 25 inH2O, 62.25 mbar, 6,216 Pa
50P	± 50 inH2O, 124.5 mbar, 12,432 Pa
1CO	± 100 inH2O, 249 mbar, 24,864 Pa
Turndown (applicable for all range codes)	2.5:1
Zero Adjust	Continuously adjustable 20-turn zero pot. Works in combination with circuit board jumper to provide a zero setpoint from –100% to +85% of full-scale.
Span Adjust	Continuously adjustable 20-turn span pot provides turn-down ratios up to 2.5:1. Works in combination with circuit board jumper for bipolar applications.

NAME	DESCRIPTION
Temperature Effects	3%/100°F combined zero and span, -20°F to +185°F
Humidity	0-100% relative humidity
Overpressure Limits	±5 psi (with less than 5% FS Zero Shift)
Max. Line Pressure	100 psi 10” H2O and below; 2000 psi above 10” H2O
Line Pressure Coefficient	10” H2O FS and below, 1% FS or less per 100 psi; above 10” H2O FS, 1% FS or less per 400 psi (typical)
Accuracy	0.5% or better, including non-linearity, hysteresis, non-repeatability, and dead band
Stability	±0.5% Full-Scale over 6 months
Damping	Time constant selectable from ¼ to 8 seconds
Signal Output	4-20 mA (true two-wire system)
EMC and Circuit Protection	US NRC RG 1.180, IEC 61000 Series, Reverse polarity, short-circuit proof
Physical Specifications	Description
Pressure Connections	¼” NPT female pressure connections on 2.125” centers
Dimensions	See drawings
Electrical Connections	Terminal barrier strip for field wiring and test points
Electrical Enclosure	Powder coated aluminum NEMA 4 with Neoprene gasket and threaded covers
Weight	16 lbs (without bracket and accessory fittings)

NAME	DESCRIPTION
O-rings	Available with BUNA-N (std.), Ethylene Propylene, Viton-A, or Silicone.
Chemical compatibility	Process fluids and gasses compatible with 410 SST, Inconel, 316 SST and selected O-ring material
Accessories	Wall Mount Seismic Mounting Kit 1000-520-0015T (2 lbs)

Accessories

Wall Mount Seismic Mounting Kit	1000-520-0015T

Documents

NAME	VIEW / DOWNLOAD
N-DR800 Model Matrix Ordering Information	View / Download
N-DR800 Power Supply Curve	View / Download
N-DR800D Draft Range Pressure Transmitter Dimensional Outline Drawing	View / Download