RTX 1000H

RTX 1000H Series

4-20mA HART® Pressure Transmitters

- URL's from 10 psi to 20,000 psi
- 100:1 rangeability
- 'Best in class' performance
- Hastelloy C diaphragm supplied as standard
- Aluminum or stainless electronics housing
- NAMUR compliant alarm outputs

GE Druck

RTX 1000H Series

Versatile Transmitters for a World of Pressure

Proven Technologies

Established in 1972, GE Druck specializes in the design and manufacture of high performance pressure sensors for a wide range of applications, using its own proven micromachined silicon and related technologies.

GE Druck has its own comprehensive and technologically advanced silicon processing facility. Silicon has excellent performance characteristics and is readily adapted for many applications, from process and subsea to race car and aerospace.

RTX 1000 Flexibility

The RTX 1000 series provides a choice of user rangeable pressure transmitters with HART® digital signal superimposed (RTX 1000 H). Offering turndowns up to 100:1 and ranging from 0.3 psi to 20,000 psi, the RTX 1000 covers the widest range of gauge and absolute pressure applications available on the market.

High Performance

The RTX 1000 provides accuracy up to 0.075% including non-linearity, hysteresis and repeatability effects. This helps the user to achieve optimum process efficiency and ultimate product quality.

Ease of Use

Zero/span push buttons and a simple configuration routine reduce user set-up and calibration time. A separate terminal on the terminal block allows a meter to be connected to check calibration without breaking into the 4-20mA loop.

Low Cost of Ownership

The RTX 1000 offers high value performance and reliable long term service. For example, 5 year stability is better than 0.2%, keeping recalibration checks and process downtime to a minimum.

Media Compatibility

A Hastelloy C276 diaphragm and 316L stainless steel pressure port are supplied as standard for compatibility with a wide range of hostile media. For severe or hygienic process conditions, remote diaphragm seals can also be supplied.

Harsh Environments

The optional stainless steel electronics housing is cost-effective for applications such as offshore oil and gas or in hygienic environments such as food and beverage or pharmaceutical facilities. The Aluminum Bronze end caps ensure free-running threads throughout the life of the transmitter.

Product Overview

GE Druck is renowned for the design and manufacture of compact and rugged high performance pressure sensors and related products for extremely accurate and reliable measurements.

The RTX 1000H extends the range to include a fully rangeable transmitter utilizing the industry standard HART® protocol. This provides enhanced performance and digital two-way communication. In addition, any span can be set within a 1:1 to 100:1 ratio of the pressure module upper range limit (URL).

To adjust span, the RTX 1000 uses a simple set-up routine using push buttons located on the electronics board. When calibration is complete, a switch locks the push buttons out of the main circuit, eliminating this potential source of drift to ensure optimum long term operational stability.

Sensing Excellence

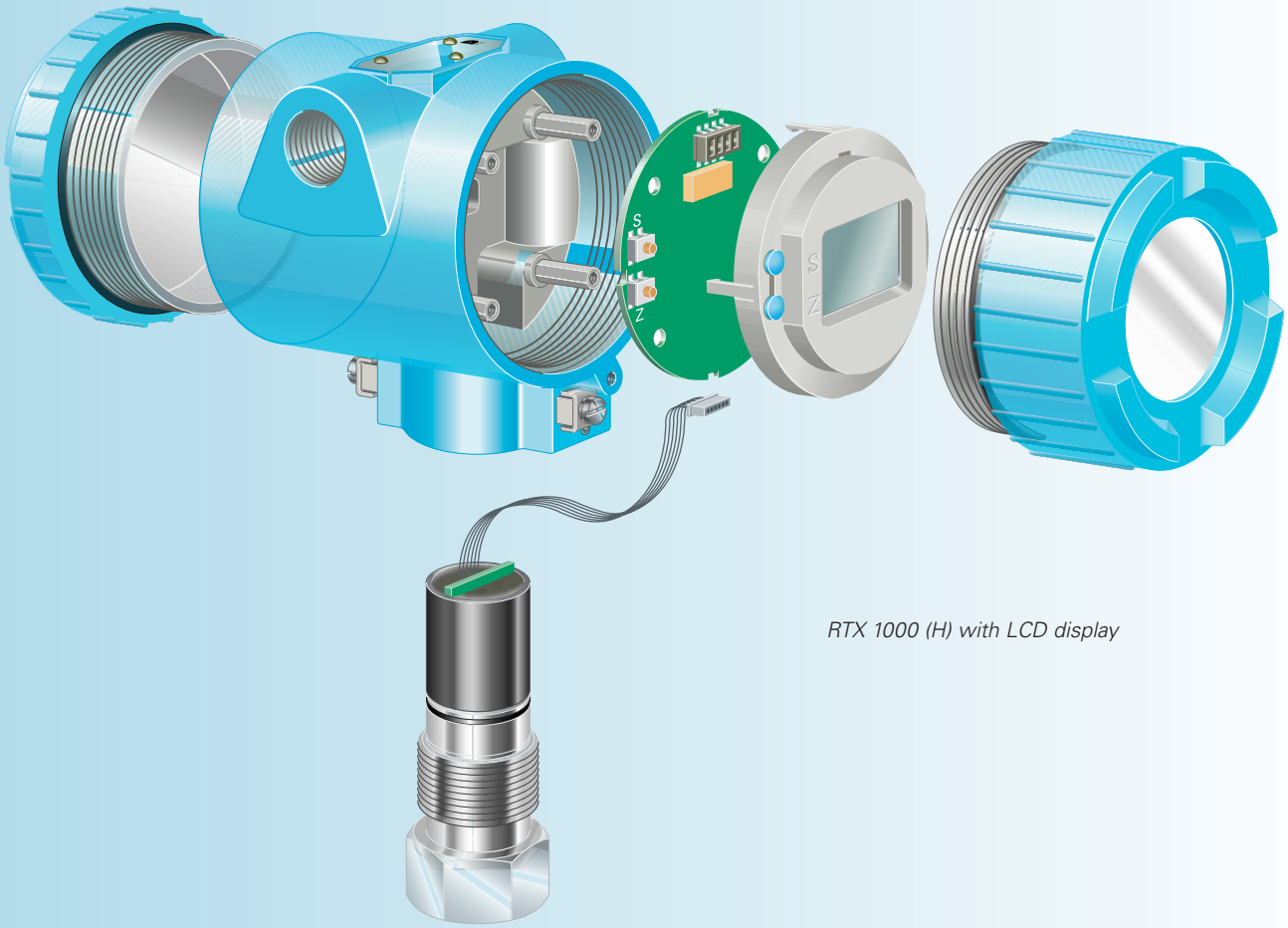
At the heart of the instrument is a micro-machined silicon sensing element. Micro-machining defines the thickness and area of the silicon which forms the pressure sensitive diaphragm and a fully active four-arm strain gauge bridge is diffused into the appropriate regions. Silicon has excellent mechanical properties being perfectly elastic and free from hysteresis, and the 'atomically' diffused gauges provide high output signals and overload capabilities.

The basic sensor is housed within a high integrity glass to metal seal, providing both electrical and physical isolation from the pressure media. The Hastelloy isolation diaphragm is electron beam welded to this seal and transmits applied pressure to the sensor via a silicone fluid filling.

Intelligent Electronics

The electronics assembly utilizes microprocessor technology to create a compact circuit with the minimum of components while producing an extremely stable signal unaffected by shifts in ambient temperature. User selectable switches provide direct access to damping adjustment, high or low failure alarm and write protection to inhibit any unauthorized change of instrument configuration.

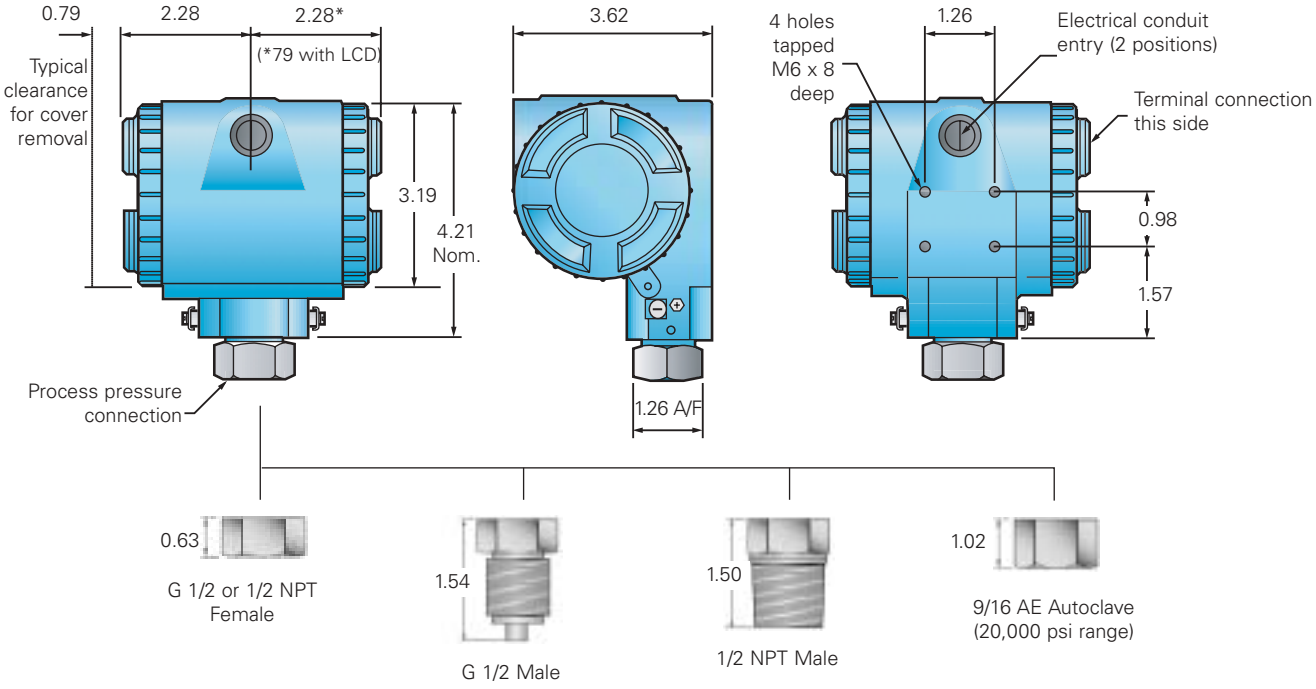
The electronics are enclosed in a compact and lightweight aluminum alloy housing which, in most cases, enables direct mounting to the process, eliminating the need for additional hardware. Alternatively, a stainless steel housing is available.



RTX 1000 (H) with LCD display

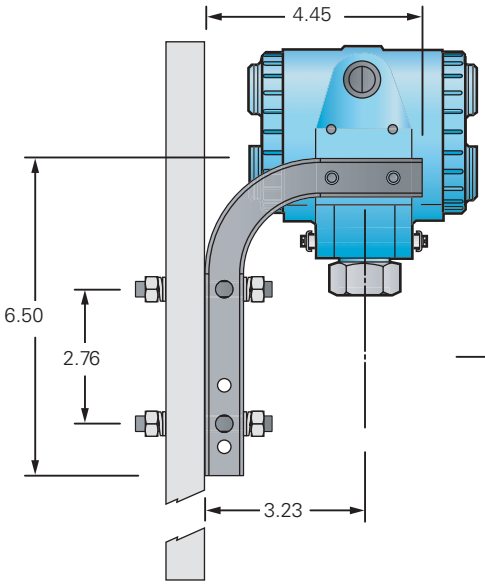
4-20mA Hart® Pressure Transmitters

Installation Drawings - Dimensions in inches

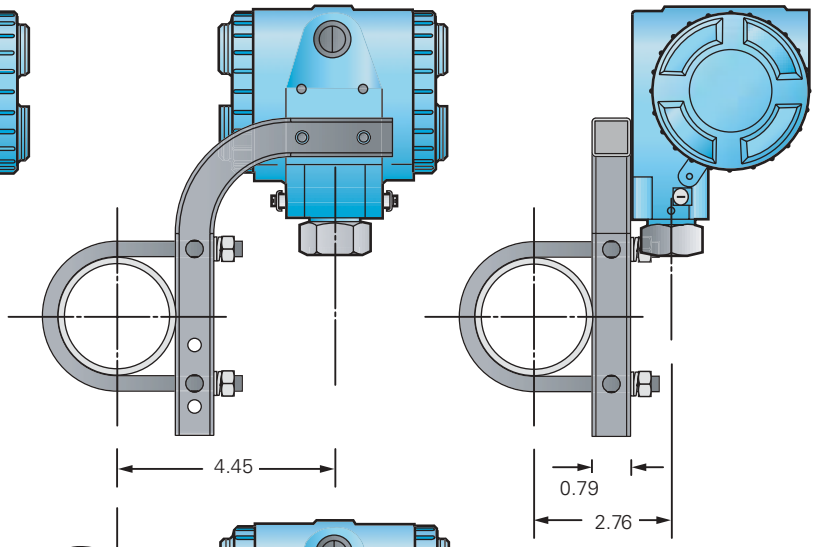


Installation - With Optional Mounting Bracket

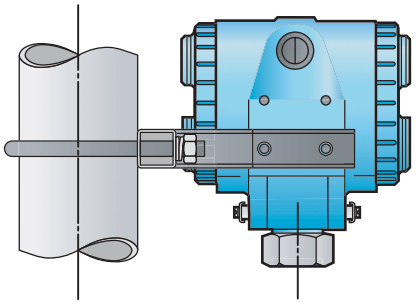
Example - Panel Mounting



Examples - Horizontal Pipe Mounting



Example - Vertical Pipe Mounting



STANDARD SPECIFICATIONS

Pressure Measurement

Pressure Ranges

Standard ranges which can be calibrated to any acceptable intermediate span/pressure unit:-

0 - 10 psi gauge or absolute
0 - 30 psi gauge or absolute
0 - 100 psi gauge or absolute
0 - 300 psi gauge or absolute
0 - 1000 psi gauge or absolute
0 - 3000 psi sealed gauge or absolute
0 - 10,000 psi sealed gauge or absolute
0 - 20,000 psi sealed gauge or absolute

Range Adjustment

Full 4 - 20mA output change for any user span setting within Upper Range Limit (URL) as below:
RTX 1000H: 1 - 100% URL
e.g. RTX 1000 H: 30 psi device can be adjusted down to a span of 0.3 psi (100:1 down ranging)

Zero offset - for absolute configurations:
RTX 1000H: 0 - 99% URL
For gauge configuration, the zero (4mA) output can be set anywhere within the range below:
RTX 1000H: -15 psi to 99% URL
e.g. 30 psi gauge device can be set 4-20mA for -15 to 15 psi. Down ranged to 3 psi span, 4-20mA can be set anywhere within range to a zero offset of 26 psi, e.g. calibrated range of 26 psi to 30 psi.

Overpressure

Rated pressure can be exceeded by the following multiples without degrading performance:

6x URL for 10 psi range
4x URL (2000 psi max) for ranges 30 psi to 1000 psi
2x URL (13,000 psi max) for ranges 3000 psi to 10,000 psi
2900 psi max for range 20,000 psi

Pressure Containment

High pressure application as below may damage sensor but process media leakage will not occur:

10x URL for 10 psi gauge range
6x URL (3000 psi max) ranges 30 to 1000 psi gauge
3000 psi for ranges up to 1000 psi absolute
20,000 psi for ranges 3000 to 10,000 psi sealed gauge or absolute
30,000 psi for range 20,000 psi sealed gauge or absolute

Process Media

Any liquid, gas or vapor compatible with Hastelloy C276 diaphragm and 316 stainless steel or Hastelloy C276 body. NACE MR-01-75 compliant.
NB. 20,000 psi range: compatible with Inconel 625.

Output Current

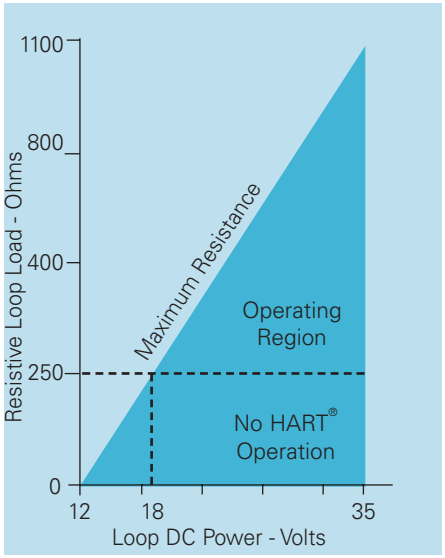
4 - 20mA (2 wire configuration).
RTX 1000 H:- HART® digital signal superimposed.

Failure Mode (NAMUR NE 43 compliant)

If pressure is applied outside upper or lower range settings, output saturates at Under Range 3.8 mA Over Range 20.5mA. Display flashes out of range.

In the event of failure, output will be driven to <3.6mA or >21mA (user configurable) and, if installed, the display will confirm the alarm status.

Transmitter Supply Voltage



Performance

Accuracy - RTX 1000H:

For calibrated Span >= 10% URL: 0.075% Span including non-linearity, hysteresis and repeatability.
For calibrated Span < 10% URL:
(0.025% + 0.005 [URL/Span])% Span

Long Term Stability

At standard reference conditions, maximum calibration change 0.2% URL over a 5 year period.

Time Response

100 ms time constant (63% response to step change in pressure with damping set to 0.1 sec).

Operating Temperature Ranges

Ambient	-40° to 185°F*
Process	-40° to 250°F
Compensated	-40° to 185°F
*(LCD option	4° to 160°F)

Temperature Effects - RTX 1000H:

-40 to 185°F, maximum output deviation from room temperature calibration at 72°F:
0.1% configured span+0.2% reading+0.1% URL
(Reading expressed as % of configured span).

Mounting Position Effect

Negligible effect for ranges < 10 psi, the 'g' offset effect can be adjusted via zero controls.

Vibration Resistance

Negligible effect at 5g from 5Hz to 2kHz.

Humidity Limit

0-100% RH.

Damping

RTX 1000H: Adjustable 0.1 to 30 seconds.

Physical

Electrical Connections

$^1/_2$ - 14 NPT, PG13.5 Female conduit entry or M20.

Process Connections

Ranges up to 10,000 psi: $^1/_2$ NPT Female, $^1/_2$NPT Male 20,000 psi range $^{13}/_{16}$"- 16 UN Female with 60° cone ($^9/_{16}$" AE medium tube autoclave fitting).

Electrical Housing

Low copper aluminium alloy with epoxy painted coating or stainless steel with aluminium bronze end caps. Sealed to NEMA 4X (IP 67).

Shipping Weight

Aluminium Housing: 2.7 lbs (without options)
Stainless Steel Housing: 6 lbsl (without options).

Hazardous Area Approvals

(F) FM and CSA

Intrinsically Safe:	Class I Division 1 Groups A,B,C,D Class II Division 1 Groups E,F,G Class III
Explosion Proof:	Class I Groups A,B,C,D Class II Groups E,F,G Class III
Division 2:	Class I Div 2 Groups A,B,C,D Class II Div 2 Groups F, G Class III Div 2 Groups F, G

(O) Safe Area: Category 1 Pressure Accessory to Pressure Equipment Directive (PED) 97/23/EC. 'Maximum Span' range is equivalent to maximum working pressure (Ps) as referred to in the PED.

(I) ATEX Intrinsically Safe Approval

CE 1180 Ex II 1G — EEx ia IIC T4 (Ta = 80°C)
EEx ia IIC T5 (Ta = 40°C)
to ATEX directive 94/9/EC

(D) ATEX Flameproof Approval

CE 1180 Ex II 2G, II 1D EEx d IIC T5 (Ta = 80°C)

(N) ATEX Type N

Ex II 3G, II 1D — EEx nl IIC T4 (Ta = 80°C)
EEx nl IIC T5 (Ta = 40°C)

All options compliant with EMC Directive 89/336/EEC EMC Emissions: EN 50081-1, EN 55022 EMC Immunity: EN 61000-6-2: 1999

CE Conformity

EMC Emissions: EN50081-1, EN55022
EMC Immunity: EN61000-6-2: 1999
PED: Pressure accessory, Category 1 Certification: CE Marked.

OPTIONS

(A) Digital indicator:
RTX 1000H: Graphic display
RTX 1000A: 5 Digit LCD Indicator.
(B) Mounting bracket for 2" pipe/panel, supplied in 316 stainless steel.
(C) Material traceability for pressure containment parts to EN10204 3.1b.

CALIBRATION STANDARDS

Products manufactured by GE Druck are calibrated against precision calibration equipment which is traceable to International Standards.

Continuing development sometimes means specification changes without notice.

RTX 1000H Series

4-20mA Hart® Pressure Transmitters

ORDERING INFORMATION

Please determine the specific model number required by appropriate selection from the following coded areas (example is given below):

X 10 — Base Model Number

Code	Diaphragm	Process Wetted body	Fill Fluid
00	Hastelloy C*	316 Stainless Steel*	Silicone Oil
10	Hastelloy C	Hastelloy C	Silicone Oil

Code	Output
H	4 - 20 mA + HARTt

Code	Max Span	Min Span (Code H)
04	0 - 10 psi	N/A
07	0 - 30 psi	0 - 0.3 psi
10	0 - 100 psi	0 - 1 psi
13	0 - 300 psi	0 - 3 psi
16	0 - 1000 psi	0 - 10 psi
18	0 - 3000 psi	0 - 30 psi
22	0 - 10,000 psi	0 - 100 psi
24	0 - 20,000 psi**	0 - 200 psi

Code	Type
A	Absolute
G	Gauge (sealed gauge for ranges above 1000 psi)

Code	Process Connection
1	G½ female
2	1/2 - 14 NPT female
3	G½ male to BS EN 837-1 (DIN 16288)
4	1/2 NPT male
5	9/16 AE medium pressure tube autoclave fitting***

Code	Electrical Entry
N	1/2 - 14 NPT female
M	M20 female
P	PG 13.5 female (via adaptor)

Code	Electronics Housing
0	Aluminium Alloy
S	Stainless Steel

Code	Approvals
F	FM/CSA Intrinsically Safe / Explosion Proof / Non Incendive
O	Safe Area
I	ATEX Intrinsically Safe
D	ATEX Flameproof
N	ATEX Type 'N'

Code	Options
O	None
LH	Digital Indicator (with output code H)
B	Mounting Bracket
T	DIN 3.1B Material Certificate

X 10 - 00 - H - 07 - G - 2 - N - 0 - D - LHB — Typical Model Number

* For 20,000 psi device (range code 24) diaphragm and process wetted body is Inconel 625.

** Available with process connection code 5 only and approvals options O, I, N or

*** Process connection code 5/Autoclave fitting applies to range code 24 (0 - 20,000 psi) only.

HART® Communicator

The Model 275 HART Communicator is the most widely used communicator on the market. Supplied with 12MB of memory, it contains the device descriptions for all HART® devices regardless of manufacturer. It also holds up to 10 transmitter configurations, with optional data packs available to expand this to 100 devices.

The LCD 8 line x 21 character display simplifies access to all functions of a HART® device. A user programmable 'hot' key allows single key stroke access to the most frequently used tasks.

Remote Diaphragm Seals

Remote diaphragm seals provide a reliable means of measuring pressure while preventing the process fluid from directly contacting the pressure transmitter. A diaphragm seal should therefore be considered where process conditions are not directly compatible with the pressure sensor.

For example, process media which is hostile to the transmitter wetted materials, contains suspended solids or is viscous, may corrode or clog the usual transmitter impulse piping and pressure connections.

For hygienic applications such as food and beverage production, a sanitary grade pressure fitting may be required.

In addition, process temperature which cannot be brought within the required range (e.g. by use of impulse piping) may also damage the transmitter and present a safety risk.

A variety of remote diaphragm seals are available to meet these and other requirements.

Manifold Valves

A range of 2, 3 and 5 valve manifolds are available to operate with the transmitters. Manufactured from 316 stainless steel, these rugged instrument manifolds are supplied with Teflon gaskets and high tensile carbon steel bolts where applicable.

Stainless steel color coded identity tags are affixed to individual valve head units: Blue for Isolate, Green for Equalize and Red for Vent functions. High temperature Grafoil gaskets and stainless steel bolts are available as an option and all valves are available compliant with NACE MR-01-75 for sour gas service if required.

The standard manifold valves are rated up to a maximum working pressure of 6000 psi (414 bar). Alternatively, a high pressure option for service up to 10,000 psi is available.

Related Products

Differential Pressure Transmitter
STX 2100

- Ranges up to 300 psi
- Line pressures to 2,000 psi
- 0.1% accuracy

Slimline Pressure Transmitter
PTX 7800 Series

- Range from 1 to 10,000 psi
- Diameter 1.2 inches
- Intrinsically Safe/Explosure Proof
- 2 KHz response time

Heavy Duty Pressure Transmitter
PTX 7900 Series

- Range from 1 to 10,000 psi
- Intrinsically Safe/Explosure Proof
- Stainless steel housing
- 2 KHz response time

Low Pressure Transmitter
LP1000 Series

- Ranges from 0.1 inH_2O to 1 psid
- Gauge and differential
- Ideal for HVAC and cleanrooms

Slimline Level Transmitter
1830 Series

- All Titanium body with 5 year corrosion warranty
- Compact 0.69" diameter
- Suitable for tank level applications
- FM/CSA Intrinsically Safe

Loop Calibrator
UPS III

- Rugged, compact/pocket size
- Measure and source 0 - 24 mA
- Accuracy 0.01% of reading

Portable Pressure Calibrators
DPI 615/DPI 615IS

- From 1 inH_2O to 10,000 psi
- Accuracy to 0.025% F.S.
- Pneumatic and hydraulic

Portable Multifunction Calibrators
TRX II/TRX II IS

- Pressure/temperature/electrical
- Dual readout: Measure and source
- Fully documenting - RS232/PCMCIA

High Pressure Pneumatic Calibrators
DPI 320/325

- From 500 to 3,000 psi
- Rugged and fully portable
- Self contained pressure source

Representative

GE Druck

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