

**Druck**

## **RTX 1000 Series**

Rangeable Pressure Transmitters

- Ranges from 70mbar to 1400 bar
- $\pm 0.15\%$  accuracy ( $\pm 0.075\%$  optional)
- 10:1 rangeability
- Aluminium or stainless steel electronics housing
- NAMUR compliant alarm outputs
- Pushbutton zero and span adjustment



# RTX 1000 Series

## Rangeable Pressure Transmitters

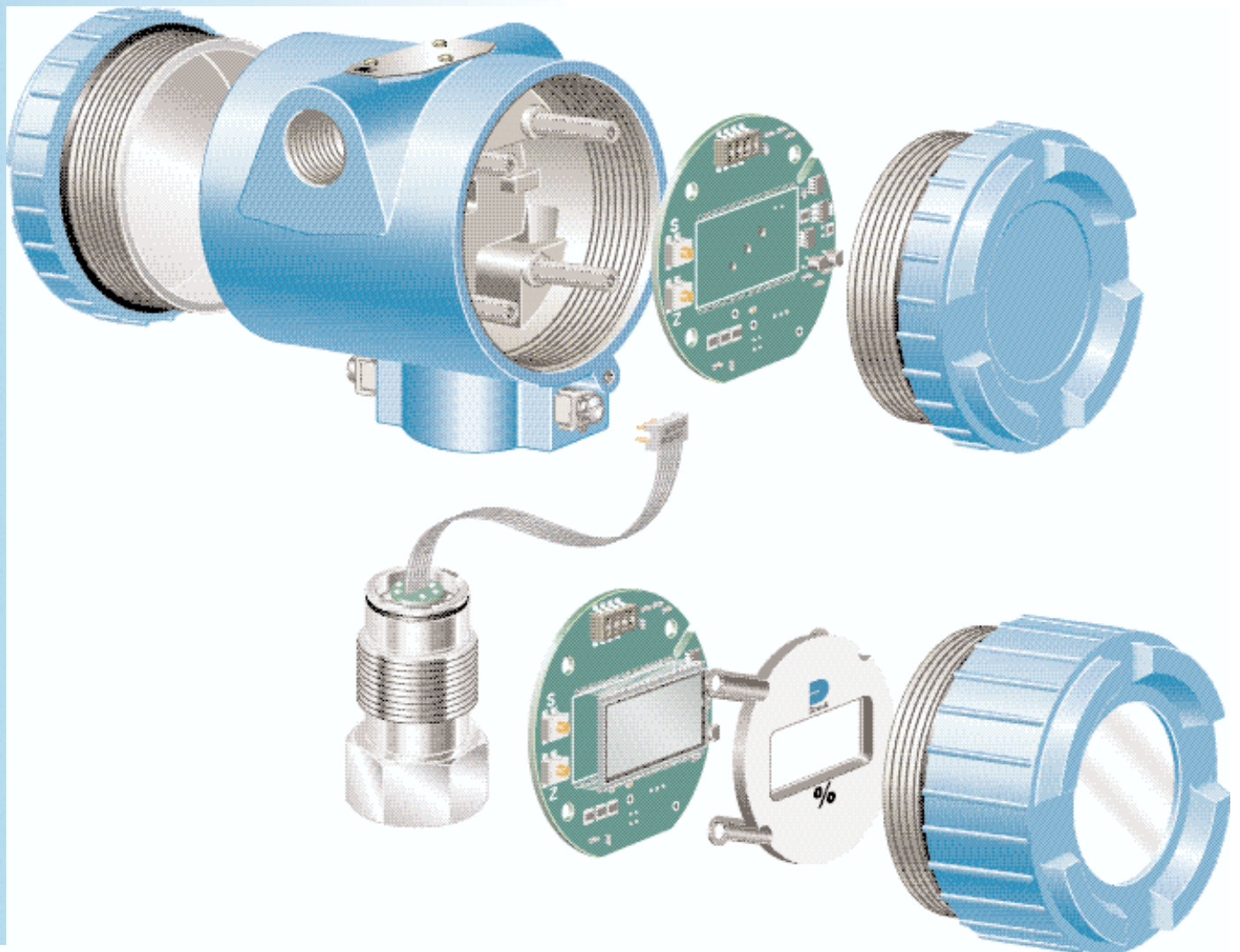
The RTX 1000 Series rangeable transmitter offers a cost effective solution to gauge and absolute pressure measurement with outstanding performance. Any span within a 1:1 to 10:1 ratio of the pressure module upper range limit can be configured via a simple set-up routine using pushbuttons located on the electronics board. When calibration is complete, a switch locks the pushbuttons out of the main circuit, eliminating this potential source of drift to ensure optimum long term stability. 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 also available. A Hastelloy media isolation diaphragm is fitted as standard enabling the RTX 1000 to be used across a broad range of industrial applications.

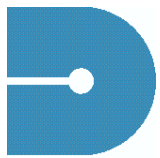
At the heart of the instrument is a micro-machined silicon sensing element. Micro-machining defines the thickness and

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.

The electronics assembly utilizes microprocessor and surface mount technology to create a compact circuit with the minimum of components. Temperature compensation algorithms are stored within the microprocessor during manufacture to minimise any errors caused by changes in ambient temperature.





## Pressure Measurement Specification Standard Ranges

The transmitter is supplied in the following standard ranges or calibrated to any acceptable intermediate span/pressure unit specified:-

- 0 - 70mbar to 0 - 700mbar gauge or absolute
- 0 - 200mbar to 0 - 2 bar gauge or absolute
- 0 - 700mbar to 0 - 7 bar gauge or absolute
- 0 - 2 bar to 0 - 20 bar gauge or absolute
- 0 - 7 bar to 0 - 70 bar gauge or absolute
- 0 - 20 bar to 0 - 200 bar sealed gauge or absolute
- 0 - 70 bar to 0 - 700 bar sealed gauge or absolute
- 0 - 140 bar to 0 - 1400 bar sealed gauge or absolute

## Range Adjustment

Span setting:-

The transmitter can be adjusted to give a full 4 - 20mA output change for any span down to 10% of the Upper Range Limit (URL) e.g. a 2 bar device can be adjusted down to a minimum span of 0.2 bar (10:1 down ranging).

Zero offset:-

0 to +90% URL for absolute configuration.  
For gauge configuration, the zero (4mA) output of the transmitter can be set anywhere within the pressure range -1bar to +90% URL (-700mbar for 700mbar range).

For example, a 2 bar gauge device can be adjusted to give 4 - 20mA for -1 to 1 bar. If down ranged to 0.2 bar span, 4 - 20mA can be provided anywhere within the pressure measurement range up to a maximum zero offset of 1.8 bar, allowing the calibrated range of 1.8 bar to 2 bar.

## Overpressure

The rated pressure can be exceeded by the following multiples without degrading performance:-

- 6 x URL for 700mbar range
- 4 x URL (140 bar maximum) for ranges up to 70 bar
- 2 x URL (900 bar maximum) for ranges from 200 bar to 700 bar.
- 2000 bar for 1400 bar range.

## Pressure Containment

Application of high pressure up to the following limits may damage the sensor but process media leakage will not occur:-

- 10 x URL for 700mbar gauge range
- 6 x URL (200 bar maximum) for ranges up to 70 bar gauge
- 200 bar for ranges up to 70 bar absolute
- 1400 bar for sealed gauge and for absolute versions from 200 bar to 700 bar.
- 2100 bar for 1400 bar range.

## Process Media

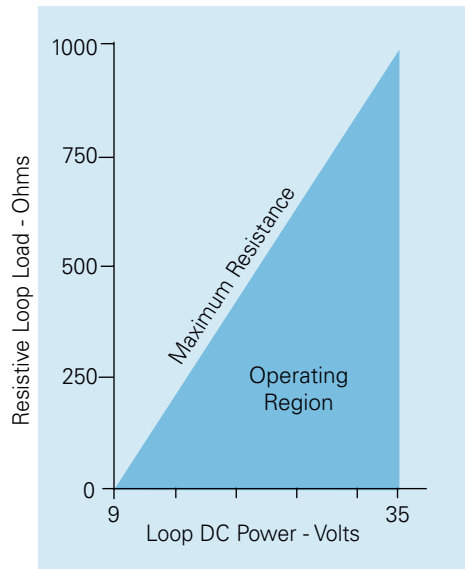
Any liquid, gas or vapour compatible with a welded assembly of a Hastelloy C276 diaphragm with either 316 stainless steel or Hastelloy C body. NACE MR-01-75 compliant.

*NB. 1400 bar unit only: liquid, gas or vapour compatible with Inconel 625.*

## Output Current

4 - 20mA (2 wire configuration) proportional to the calibrated pressure range.

## Transmitter Supply Voltage



## Failure Mode (NAMUR NE 43 compliant)

If a pressure is applied to the transmitter outside of the upper or lower range settings, the output signal will saturate at the following values:

- Under Range: 3.8mA to 4.0mA
- Over Range: 20mA to 20.5mA

If fitted, the LCD indicator will flash to signify an "out of range" reading.

In the event of a transmitter failure, the output will be driven to <3.6mA or >21mA (user configurable) and, if fitted, the LCD indicator will display "ALA" to signify alarm state.

## Performance Specification

### Accuracy

±0.15% of calibrated span including the combined effects of non-linearity, hysteresis and repeatability. *Note: ±0.075% available on request.*

### Long Term Stability

At standard reference conditions, the calibration will not change by more than 0.1% URL per annum.

### Time Response

125 ms time constant (63% response to step change in pressure with damping set to 0.1 second) typical.

### Operating Temperature Ranges

Ambient	-40° to 85°C
(LCD option)	-20° to 70°C
Process	-40° to 120°C
Compensated	-40° to 85°C

### Temperature Effects

Range	Performance Effect
-40 to -20°C	±(0.5% URL + 1% span)
-20 to 50°C	±(0.25% URL + 0.75% span)
50 to 85°C	±(0.5% URL + 1% span)

## Mounting Position Effect

Negligible effect, but for ranges below 700mbar, the 'g' offset effect can be adjusted via the zero controls.

## Vibration Resistance

Negligible effect on performance at 5g from 5Hz to 2000Hz.

## Humidity Limit

0-100% RH.

## Turn-on time

Less than 2 seconds.

## Damping

0.1 or 1 second (switch selectable).

## Hazardous Area Approvals

Designed to meet international standards for Intrinsic Safety and Flameproof approval.

CENELEC Intrinsic Safety Certification:-

EEx ia IIC T4 (Ta = 80°C)

T5 (Ta = 40°C)

CENELEC Flameproof Certification:-

EEx d IIC T5 (Ta = 80°C)

Type N (Non-incendive) certification:-

EEx N IIC T4 (Ta = 85°C)

## CE Conformity

EMC Emissions: EN50081-1

EMC Immunity: EN50082-1

Certification: CE Marked.

## Physical Specification

### Electrical Connections

M20, 1/2 - 14 NPT, or PG13.5 Female threaded electrical conduit.

### Process Connections

Ranges up to 700 bar: G<sub>1/2</sub>F, 1/2 NPTF, G<sub>1/2</sub>M to BS EN 387-1 (DIN 16288), or 1/2 NPTM.  
1400 bar range: 1 3/16" - 16 UN female thread and 60° cone for 3/16" AE medium pressure tube fitting (20,000 psi).

### Electrical Housing

Low copper aluminium alloy with epoxy double coating or stainless steel with aluminium bronze end caps. Environmental Protection IP67.

### Fill fluid

Silicone Oil.

### Shipping Weight

Aluminium Housing: 1.2kg (without options)

Stainless Steel Housing: 2.7kg (without options).

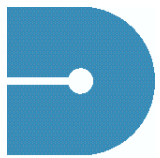
### Options

- (1) 5 Digit LCD Indicator 0-100% (user configurable to display other units).
- (2) Mounting bracket for 2" pipe/panel, supplied in 304 stainless steel.
- (3) Material traceability for pressure containment parts to EN10204 3.1b.

### Accessories

A wide range of remote diaphragm seals including flanged and hygienic connections, and manifold valves are also available. *Please refer to separate datasheet.*





### Rangeable Pressure Transmitters

#### Ordering Information

Please state the following:

<b>X 10</b>	<b>Base Model Number</b>		
<b>Code</b>	<b>Diaphragm</b>	<b>Process Wetted body</b>	<b>Fill Fluid</b>
00	Hastelloy C	316 Stainless Steel	Silicone Oil*
10	Hastelloy C	Hastelloy C	Silicone Oil
	<b>Code</b>	<b>Range</b>	
	04	0 - 70mbar to 0 - 700mbar	
	07	0 - 200mbar to 0 - 2 bar	
	10	0 - 700mbar to 0 - 7 bar	
	13	0 - 2 bar to 0 - 20 bar	
	16	0 - 7 bar to 0 - 70 bar	
	18	0 - 20 bar to 0 - 200 bar	
	22	0 - 70 bar to 0 - 700 bar	
	24	0 - 140 bar to 0 - 1400 bar**	
	<b>Code</b>	<b>Type</b>	
	A	Absolute	
	G	Gauge (sealed gauge for ranges above 70 bar)	
	<b>Code</b>	<b>Process Connection</b>	
	1	G 1/2 female	
	2	1/2 - 14 NPT female	
	3	G 1/2 male to BS EN 387-1 (DIN 16288)	
	4	1/2 - 14 NPT male	
	5	9/16 AE medium pressure tube autoclave fitting***	
	<b>Code</b>	<b>Electrical Entry</b>	
	M	M20 female	
	N	1/2 - 14 NPT female (via adaptor)	
	P	PG 13.5 female (via adaptor)	
	<b>Code</b>	<b>Electronics Housing</b>	
	0	Aluminium Alloy	
	S	Stainless Steel	
	<b>Code</b>	<b>Approvals</b>	
	0	Safe Area	
	I	Dual Intrinsically Safe and Type 'N'	
	D	Flameproof	
	<b>Code</b>	<b>Options</b>	
	0	None	
	L	Digital Indicator(0-100%)	
	B	Mounting Bracket	
	T	DIN 3.1B Material Certificate	
	H	Improved accuracy (0.075%)	

X 10 00 - 07 - G - 2 - P - 0 - 0 - 0 - 0 Typical Model Number

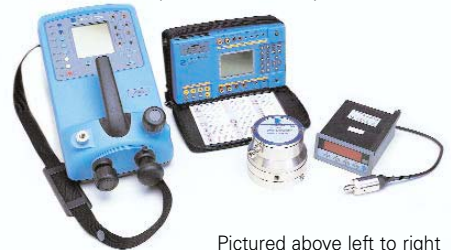
\* For 1400 bar device (range code 24) diaphragm and process wetted body is Inconel 625.

\*\* Available with Process Connection Code 5 only

\*\*\* Applies to range code 24 only

#### Related Products

Druck manufactures a wide range of pressure transducers and transmitters, associated digital indicators, barometers, and a complete range of precision process calibrators and controllers for the field, workshop and laboratory.



Pictured above left to right  
 DPI 610 Portable Pressure Calibrator  
 TRX-II Portable Documenting Calibrator  
 LPX 9000 Low Pressure Transmitter  
 DPI 280 Digital Process Indicator

Pictured below left to right  
 Pressurements T9000 deadweight tester  
 Druck DPI 520 ATE Pressure Controller

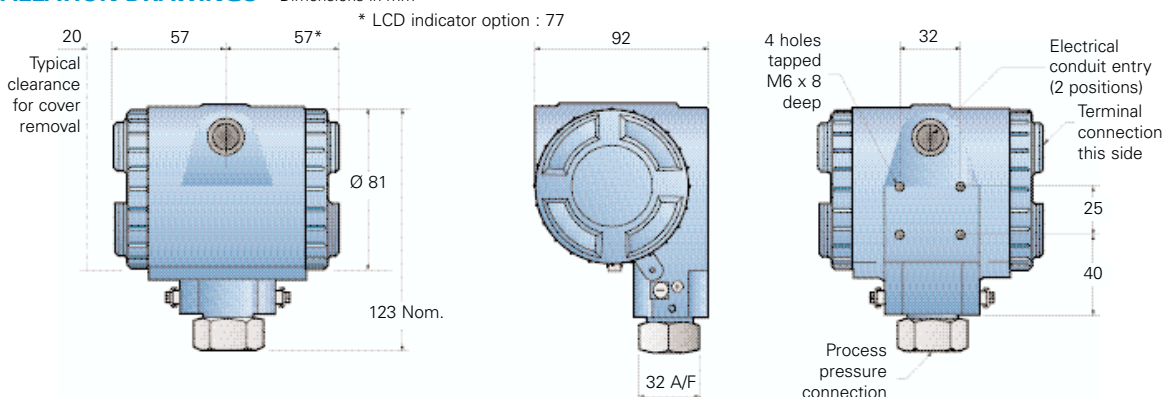


#### Calibration Standards

Instruments manufactured by Druck Limited are calibrated against precision pressure calibration equipment which is traceable to International Standards.

*Continuing development sometimes necessitates specification changes without notice.*

#### INSTALLATION DRAWINGS - Dimensions in mm



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## instrumentation

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