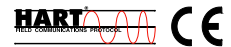


Oil & Gas Panel Pressure Transmitter

TRANSMITTER FEATURES:

- *A compact, lightweight, all-welded stainless steel design*
- *40:1 rangeability for increased flexibility and reduced inventories*
- *3 year stability guarantee reduces maintenance costs*
- *Leading edge capacitance sensor with integral temperature measurement for improved total performance*
- *4-20 mA HART[®] Smart capabilities and 0.25% of calibrated span reference accuracy*



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Legendary Rosemount Performance, Customized For Your Panel Applications

The Rosemount 4600 Oil & Gas Panel Transmitter is a compact, reliable transmitter designed to meet your panel-mount monitoring needs. The Rosemount 4600 continues the Rosemount tradition of delivering superior performance, industry leading reliability, and exceptional value.

A compact, lightweight, all-welded stainless steel design

You asked for it and we've delivered — the stability, performance and reliability of Rosemount are now available in a compact transmitter for your space and weight constrained panel applications. The entire transmitter weighs less than 1.5 pounds (0,6 kg) and the all-welded, hermetic enclosure maximizes reliability by minimizing environmental effects, such as salt spray and humidity, on the electronics and sensor.

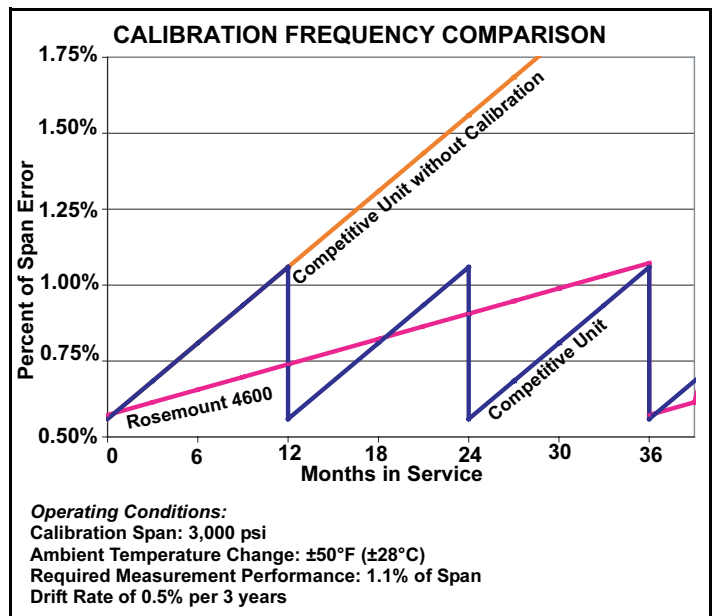
40:1 rangeability for increased flexibility and reduced inventories

Rosemount understands that Oil & Gas Well Pressures are sometimes unpredictable, and that's why we've incorporated 40:1 rangeability into the Rosemount 4600 Oil & Gas Panel Transmitter. Not only does 40:1 rangeability allow you incredible flexibility, it also lowers your transmitter inventories by allowing you to measure pressure ranges from 20 psi to 20,000 psi with only 4 transmitter ranges.

Leading edge capacitance sensor with integral temperature measurement for improved total performance

Integral temperature measurement means the Rosemount 4600 provides superior temperature compensation and therefore, a more precise pressure measurement over the entire operating temperature range.

3-year stability guarantee reduces maintenance costs



Most competitive devices can drift out of specification after just a few months and require recalibration, which consumes both your time and money. The Rosemount 4600 carries a 3-year "Set and Forget" stability guarantee to reduce the frequency of calibration and lower maintenance costs.

4-20 mA HART Smart capabilities and 0.25% of calibrated span reference accuracy

The HART protocol enables quick and easy reranging, calibration and troubleshooting for nearly effortless field adjustments. As always, reference accuracy is specified as a percent of *calibrated span*, not as a percent of full scale, so you're guaranteed 0.25% reference accuracy whether you're measuring 20,000 psi or 20 psi.

Specifications

PERFORMANCE SPECIFICATIONS

For zero-based spans, reference conditions, silicone oil fill, SST materials, 1/2 in. - 14 NPT process connections, digital trim values set to equal range points. Does not include any error due to the effects of sealed gauge.

Conformance to specification (±3 Sigma)

Technology leadership, advanced manufacturing techniques and statistical process control ensure specification conformance to at least ±3 sigma.

Reference Accuracy

Includes the effects of terminal based linearity, hysteresis, and repeatability.

Range 2: ±0.25% of calibrated span from 1:1 to 7.5:1 rangedown

Range 4: ±0.25% of calibrated span from 1:1 to 40:1 rangedown

Range 5: ±0.25% of calibrated span from 1:1 to 30:1 rangedown

Range 6: ±0.25% of calibrated span from 1:1 to 30:1 rangedown

Long Term Stability

0.5% of span for 3 years under normal operating conditions

Vibration Effect

Less than ±0.1% of URL when tested per the requirements of IEC 60770.84 pipeline (general and extreme vibration level) (10-60 Hz 0.21mm peak to peak displacement/60-2000 Hz 3g).

Range and Sensor Limits

Rosemount 4600 Oil & Gas Panel Transmitter Range Limits								
Units	Range 2		Range 4 Span		Range 5		Range 6	
	min.	max.	min.	max.	min.	max.	min.	max.
psi	20	150	125	5,000	330	10,000	660	20,000
MPa	0.14	1.03	125	34.47	2.28	68.95	4.55	137.90
bar	1.38	10.34	125	344.74	22.75	689.48	45.51	1378.95
kg/cm ²	1.41	10.55	125	351.535	23.20	703.07	46.40	1406.14

RFI Effects

±0.15% of span from 20 MHz to 1000 MHz for field strength up to 10 V/m.

Transient Protection (Option T1)

Meets IEEE C62.41, Category B

6 kV crest (0.5 μs - 100 kHz)

3 kA crest (8 × 20 microseconds)

6 kV crest (1.2 × 50 microseconds)

Meets IEEE C37.90.1, Surge Withstand Capability

SWC 2.5 kV crest, 1.25 MHz wave form

General Specifications:

Response Time: < 1 nanosecond

Peak Surge Current: 5000 amps to housing

Peak Transient Voltage: 100 V dc

Loop Impedance: < 25 ohms

Applicable Standards: IEC61000-4-4, IEC61000-4-5

NOTE:

Calibrations at 68 °F (20 °C) per ASME Z210.1 (ANSI)

FUNCTIONAL SPECIFICATIONS

Dynamic Performance

500 Milliseconds (response time + dead time)

Ambient Temperature Effect per 100°F (56°C)

±0.03% URL + 1.0% span from 1:1 to maximum rangedown

Service

Liquid, gas, and vapor applications

4–20 mA (output code A)

Zero and Span Adjustment

Zero and span values can be set anywhere within the range.
Span must be greater than or equal to the minimum span.

Output

Digital process variable superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol.

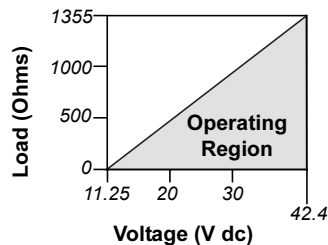
Power Supply

External power supply required. Standard transmitter (4–20 mA) operates on 11.25 to 42.4 V dc with no load.

Load Limitations

Maximum loop resistance is determined by the voltage level of the external power supply, as described by:

$$\text{Max. Loop Resistance} = 43.5 (\text{Power Supply Voltage} - 11.25)$$



Communication requires a minimum loop resistance of 250 ohms.

Overpressure Limits

Transmitters withstand the following pressure without damage:

- Range 2: 1,500 psi (103,4 bar)
- Range 4: 7,500 psi (517,1 bar)
- Range 5: 15,000 psi (1034 bar)
- Range 6: 24,000 psi (1655 bar)

Burst Pressure Limits

- Range 2: 11,000 psi (758,4 bar)
- Range 4: 11,000 psi (758,4 bar)
- Range 5: 26,000 psi (1793 bar)
- Range 6: 31,000 psi (2137 bar)

Temperature Limits

Ambient

–40 to 185 °F (–40 to 85 °C)

Storage

–50 to 230 °F (–46 to 110 °C)

Process Temperature Limits

–40 to 200 °F (–40 to 93°C)

Turn-On Time

Performance within specifications less than 2.5 seconds after power is applied to the transmitter

Damping

Analog output response to a step input change is user-selectable from 0.3 to 60 seconds for one time constant. This software damping is in addition to sensor module response time.

Failure Mode Alarm

HART 4-20mA (output code A)

If self-diagnostics detect a gross transmitter failure, the analog signal will be driven offscale to alert the user. Rosemount standard and custom alarm levels are available.

High or low alarm signal is software-selectable.

Alarm Configuration

Rosemount

High Alarm: ≥ 21.75 mA

Low Alarm: ≤ 3.75 mA

Custom Level ⁽¹⁾

High Alarm: 20.2 - 23.0 mA

Low Alarm: 3.6 - 3.8 mA

(1) Low alarm must be 0.1 mA less than low saturation and high alarm must be 0.1 mA greater than high saturation.

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PHYSICAL SPECIFICATIONS

Electrical Connections

$\frac{1}{2}$ -14 NPT Male, 72in. flying leads (polyvinyl chloride insulated #18 AWG copper wire)

Conduit Seal

Integral conduit seal meets the requirements of NEC[®] 2002 section 501.5 (A), 501.5 (B) and 505.16 (B)(1). No additional conduit seal required.

Process Connections

- $\frac{1}{2}$ -14 NPT female (Available on Ranges 2 and 4 only)
- $\frac{1}{4}$ -18 NPT female (Not available on Range 6)
- Autoclave type F-250-C (Pressure relieved $\frac{9}{16}$ -18 gland thread: $\frac{1}{4}$ OD high pressure tube 60° cone: available Range 5 and 6 transmitters only.

Process Sealing

Reliable dual process seal design meets the requirements NEC[®] 2002 section 501.5 (F)(3), 505.16 (E)(3) and API 14F/14FZ 6.8.2.2. No additional process sealing is required.

Process-Wetted Parts

Process Isolating Diaphragms

316L SST ⁽¹⁾

Hastelloy C-276[®] ⁽¹⁾

Non-Wetted Parts

Electronics Housing

316L SST

NEMA 4X

IP 68, IP 66

Sensor Module Fill Fluid

Silicone

Shipping Weights for Rosemount 4600

Range 2 and 4: 1.34 lb. (0,61 kg.)

Range 5 and 6: 2.03 lb. (0,92 kg.)

(1) *Materials of Construction comply with recommendations per NACE MR0175/ISO 15156 for sour oilfield production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.*

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota, USA

Ordinary Locations Certifications

As standard, the transmitter has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by FM, a nationally recognized testing laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

European Pressure Equipment Directive (PED) (97/23/EC)

Model 4600 Pressure Transmitters-
Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (89/336/EEC)

All Models: EN 50081-1: 1992; EN 50082-2:1995;
EN 61326-1:1997/ A1 1998– Industrial

Process Sealing Certification

FM Approved Dual Process Seal

Certified to the requirements of ANSI / ISA 12.27.01

No additional sealing required.

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM) Approvals

- E5** Explosion-Proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G hazardous locations; Temperature Code T5 ($T_{amb} = -40^{\circ}\text{C}$ to 85°C); Explosion-Proof for Class 1, Zone 1 AEx d IIC T5 ($T_{amb} = -40^{\circ}\text{C}$ to 85°C); Enclosure Type 4X
Conduit seal not required
- I5** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Temperature Code T4 ($T_{amb} = -50^{\circ}\text{C}$ to 70°C); Intrinsically Safe for use in Class I, Zone 0 AEx ia IIC T4 ($T_{amb} = -50^{\circ}\text{C}$ to 70°C); Non-incendive for Class I, Division 2, Groups A, B, C, and D; When connected in accordance with Rosemount drawing 04620-5007; Enclosure Type 4X
For entity parameters see control drawing 04620-5007

Canadian Standards Association (CSA) Approvals

- E6** Explosion-Proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G hazardous locations; Temperature Code T5 ($T_{amb} = -50^{\circ}\text{C}$ to 40°C); Explosion-Proof for Class 1, Zone 1 Ex d IIC T5 ($T_{amb} = -20^{\circ}\text{C}$ to 40°C); Suitable for Class I, Division 2, Groups A, B, C, and D, when installed per Rosemount drawing 04620-5005; Enclosure Type 4X
Conduit seal not required
- I6** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Temperature Code T3C ($T_{amb} = -50^{\circ}\text{C}$ to 70°C); Intrinsically Safe for use in Class I, Zone 0 Ex ia IIC T4 ($T_{amb} = -50^{\circ}\text{C}$ to 70°C); When connected in accordance with Rosemount drawing 04620-5005; Enclosure Type 4X
For entity parameters see control drawing 04620-5005

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European Certifications

I1 ATEX Intrinsic Safety
Certificate No. Baseefa03ATEX0114X
ATEX Marking: Ⓔ II 1 G
EEx ia IIC T4 (-40 ≤ Ta ≤ 70°C)
CE 1180
Input Parameters:
U_i = 30V
I_i = 200mA
P_i = 1.0W
C_i = 35nF
L_i = 390μH

SPECIAL CONDITIONS FOR SAFE USE (X):

The Apparatus with the Transient Protection (T1) option is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020 2002. This must be taken into account when installing the apparatus.

E1 ATEX Flame-Proof
Certificate No. KEMA02ATEX2231X
ATEX Marking: Ⓔ II 1/2 G
EEx d IIC T6 (-40 ≤ Ta ≤ 80°C)
CE 1180

SPECIAL CONDITIONS FOR SAFE USE (X):

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

The Model 4600 Pressure transmitter is provided with a permanently connected unterminated cable. The free end of the cable shall be connected using a suitable junction box, e.g. in type of explosion protection flameproof enclosure "d" or increased safety "e".

N1 ATEX Type n
Certificate No. Baseefa03ATEX0115X
ATEX Marking: Ⓔ II 3 G
EEx nA II T5 (-40 ≤ Ta ≤ 70°C)
U_i = 42.4V MAXIMUM

SPECIAL CONDITIONS FOR SAFE USE (X):

The Apparatus with the Transient Protection (T1) option is not capable of withstanding the 500V insulation test required by Clause 9.1 of EN50021 1999. This must be taken into account when installing the apparatus.

ND ATEX Dust Ignition-Proof
Certificate No. KEMA02ATEX2231X
ATEX Marking: Ⓔ II 1 D
Dust Rating: T85°C (-40 ≤ Ta ≤ 80°C)
IP66, IP68
CE 1180
V = 42.4 Volts MAX
A = 24mA

SPECIAL CONDITIONS FOR SAFE USE (X):

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

The Model 4600 Pressure transmitter is provided with a permanently connected unterminated cable. The free end of the cable shall be connected using a suitable junction box, e.g. in type of explosion protection flameproof enclosure "d" or increased safety "e".

Combinations of Certifications

A certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

K1 Combination of **E1**, **I1**, and **N1**
K5 Combination of **E5** and **I5**
K6 Combination of **E6** and **I6**
KA Combination of **E1**, **I1**, **E6**, and **I6**
KB Combination of **E5**, **I5**, **I6** and **E6**
KC Combination of **E5**, **E1**, **I5** and **I1**

Dimensional Drawings

FIGURE 1. Dimensional Drawings for the Rosemount 4600 Oil & Gas Panel Pressure Transmitter

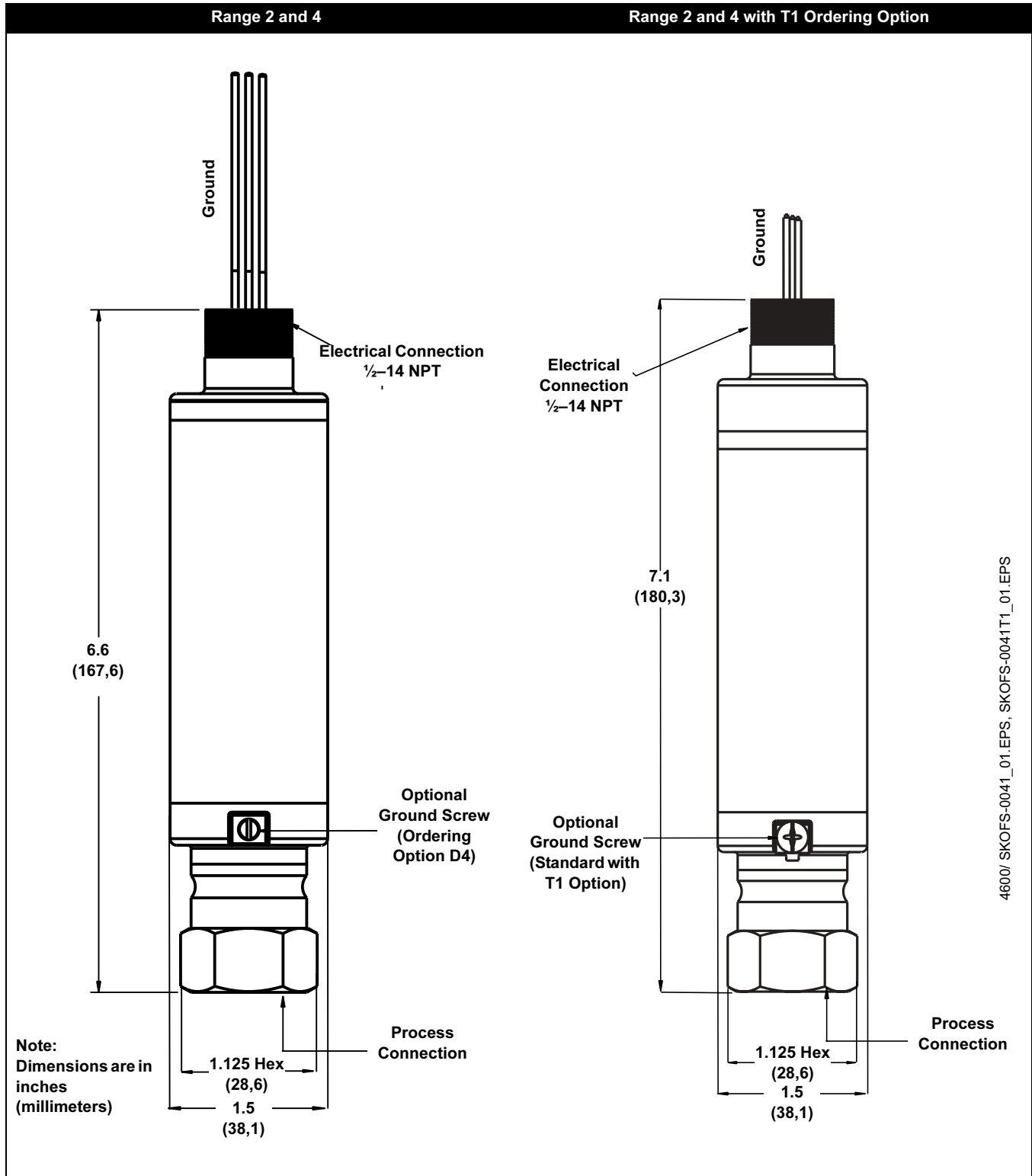
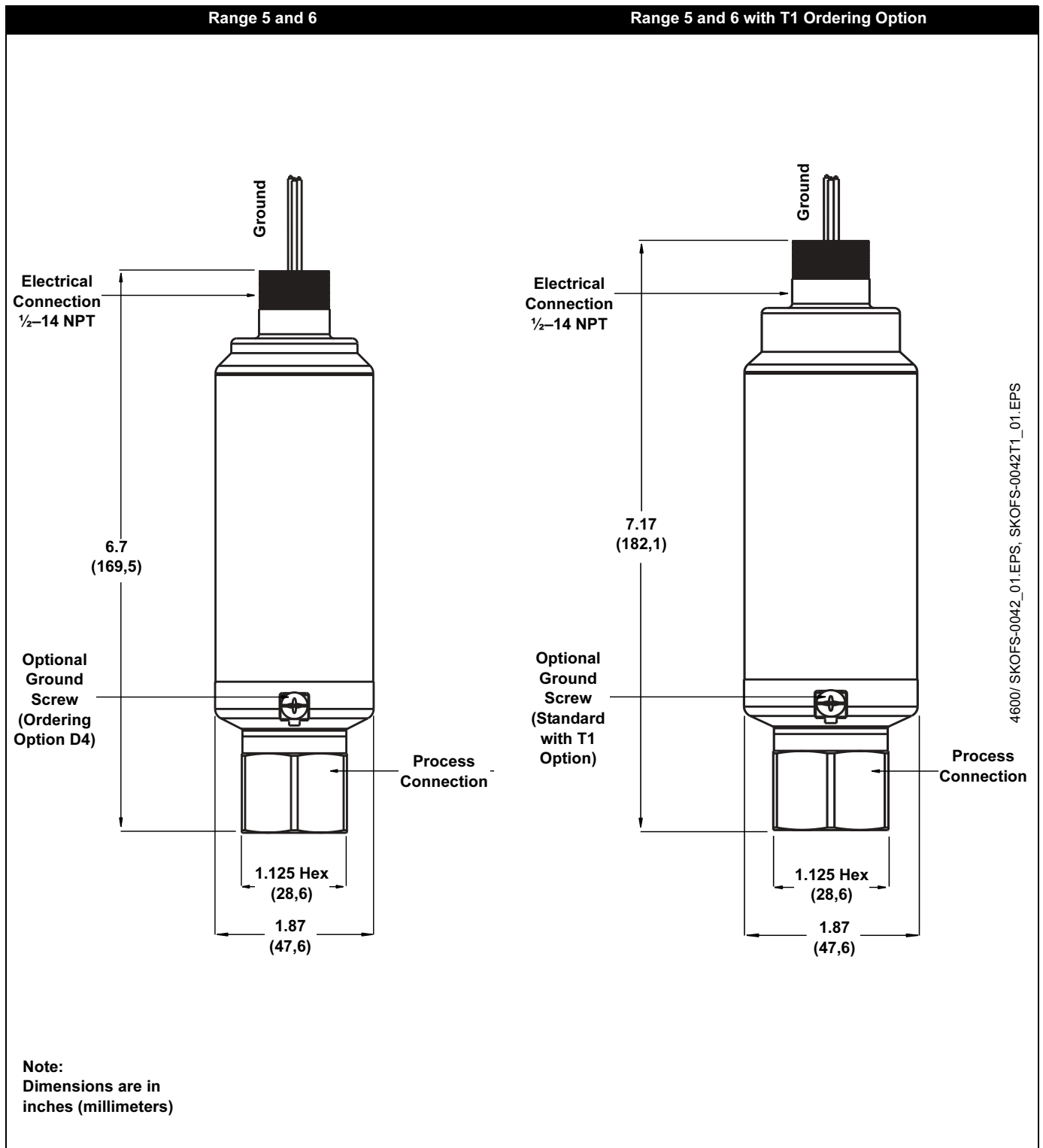


FIGURE 2. Dimensional Drawings for the Rosemount 4600 Oil & Gas Panel Pressure Transmitter



Ordering Information

Model	Transmitter Type
4600	Oil and Gas Panel Pressure Transmitter
Code	Measurement Type
G	Sealed Gauge
A	Absolute
Code	Pressure Range
2	0-20 to 0-150 psi
4	0-125 to 0-5000 psi
5	0-330 to 0-10,000 psi
6	0-660 to 0-20,000 psi (available only with H11)
Code	Isolating Diaphragm/ Process Connection Materials
2	316L SST ⁽¹⁾
3	Hastelloy C-276 ⁽¹⁾
Code	Process Connection Style
E09	¹ / ₄ -18 NPT Female (not available with Pressure Range 6)
E11	¹ / ₂ -14 NPT Female (not available with Pressure Range 5 or 6)
H11	Coned and Threaded, compatible with autoclave type F-250-C (available on Pressure Ranges 5 and 6 only)
Code	Output
A	4-20 mA with Digital Signal Based on HART protocol
Code	Electrical Connection
5A	¹ / ₂ -14 NPT Male with 72 in. Flying Lead
Code	Options
	Software Configuration
C1	Custom Software Configuration (CDS required with order)
	Alarm Limits
C6	Custom Alarm and Saturation Signal Levels, High Alarm
C7	Custom Alarm and Saturation Signal Levels, Low Alarm
	Hardware Adjustments
D1	Zero and Span Adjustments
	External Ground Screw Assembly
D4	External Ground Screw Assembly
	Product Certifications
E1	ATEX Flameproof
I1	ATEX Intrinsic Safety
K1	ATEX Flameproof, Intrinsic Safety, Type n (combination of E1, I1, and N1)
N1	ATEX Type n
ND	ATEX Dust Ignition-Proof
E5	FM Approval Explosionproof
I5	FM Approval Intrinsic Safety, Non-incendive
K5	FM Approval Explosionproof, Intrinsic Safety, Non-incendive (combination of E5 and I5)
E6	CSA Explosionproof, Division 2
I6	CSA Intrinsic Safety
K6	CSA Explosionproof, Intrinsic Safety, Division 2 (combination of E6 and I6)
KA	ATEX/ CSA Flameproof and Intrinsic Safety (combination of E1, I1, E6, and I6)
KB	FM Approval and CSA Explosionproof and Intrinsic Safety (combination of E5, E6, I5, and I6)
KC	FM Approval and ATEX Explosionproof and Intrinsic Safety (combination of E5, E1, I5, and I1)

Options (Continued)

Special Certifications

- | | |
|----|--|
| Q4 | Calibration data certificate consistent with ISO 10474 2.1 or EN 10204 2.1 |
| Q8 | Material traceability certification per EN 10204 3.1.B |

Transient Protection

- | | |
|----|----------------------|
| T1 | Transient protection |
|----|----------------------|

Typical Model Number: 4600 G 4 2 E11 A 5A D1 E5

(1) *Materials of Construction comply with recommendations per NACE MR0175/ISO 15156 for sour oilfield production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.*

SIGNAL SELECTION: (Software Selectable)

4-20 mA with simultaneous digital signal based on HART protocol★

Burst mode of HART digital process variable

Burst mode output options:

- Primary variable in engineering units
- Primary variable in percent of range
- All dynamic variables in engineering units
- All dynamic variables in engineering units and the primary variable mA value

Multidrop Communication Transmitter Address (1-15): |_|_| (default = 1)

SECURITY INFORMATION ⁽¹⁾

Write Protect: On **Off** ★

ANALOG OUTPUT ALARM AND SATURATION SIGNAL LEVELS ⁽¹⁾

All categories must be completed for custom configuration.

Custom (Requires Option C6 or C7)= Low Alarm: (\leq |_|_|.|_|_| mA)—values must be between 3.8 and 3.6

Low Saturation (|_|_|.|_|_| mA)—values must be between 3.9 and 3.7

* Low alarm must be 0.1 mA lower than the low saturation value

High Alarm (\geq |_|_|_|_|_|_|_|_| mA)—values must be between 20.2 and 23.0

High Saturation (|_|_|_|_|_|_|_|_| mA)—values must be between 20.1 and 21.5

* High alarm must be at least 0.1 mA higher than the high saturation value

For Reference Only:
 Alarm Values: Values (mA) the transmitter outputs if it detects a gross malfunction condition.
 Saturation Values: Values (mA) the transmitter outputs if applied pressure goes outside the 4–20 mA range values.

Standard ★ =	Low Alarm: (\leq 3.75 mA)	Low Saturation (3.9 mA)
	High Alarm (\geq 21.75 mA)	High Saturation (20.8 mA)

Continued on Next Page

(1) Requires a C1 option code.

PROCESS VARIABLE OUTPUT ASSIGNMENTS ⁽¹⁾						
Primary Variable ★	<input type="checkbox"/>	Measured Pressure ★	<input type="checkbox"/>	Scaled Variable Pressure	<input type="checkbox"/>	
Secondary Variable:	<input type="checkbox"/>	Measured Pressure	<input type="checkbox"/>	Scaled Variable Pressure	<input type="checkbox"/>	Device Temperature ★
Tertiary Variable:	<input type="checkbox"/>	Measured Pressure	<input type="checkbox"/>	Scaled Variable Pressure★	<input type="checkbox"/>	Device temperature

SCALED VARIABLE INFORMATION ⁽¹⁾	
Scaled Units = _ _ _ _ _ _ _ _ (5 characters max—spaces consume 0-9, A-Z, /, %, -, and * character positions)	
Transfer Function=	
<input type="checkbox"/> Linear ★	
Linear Scaled Variable (with Linear option only)	
Low pressure value _ _ _ _ _ _ _ _ (Eng. Units)	
High pressure value _ _ _ _ _ _ _ _ (Eng. Units)	
Low scaled value _ _ _ _ _ _ _ _ (Scaled Units)	
High scaled value _ _ _ _ _ _ _ _ (Scaled Units)	
Linear Offset _ _ _ _ _ _ _ _ (Eng. Units)	
Range Values—both categories must be completed. (used when scaled variable is set to primary variable)	
LRV _ _ _ _ _ _ _ _ (Scaled Unit) (seven characters max)	URV _ _ _ _ _ _ _ _ (Scaled Unit) (seven characters max)

PROCESS ALERT SETPOINTS ⁽¹⁾	
Process alert set points are values set by the user where the transmitter outputs a HART message when the applied pressure or temperature goes outside the designated range. The pressure values are limited to the range of the transmitter.	
Pressure Process Alert (HART signal only) <input type="checkbox"/> On <input type="checkbox"/> Off ★ <input type="checkbox"/> Low alert _ _ _ _ _ _ _ _ (Eng. Unit) (LRL ≤ Low Alert ≤ High Alert ≤ URL) <input type="checkbox"/> High Alert _ _ _ _ _ _ _ _ (Eng. Unit)	Temperature Process Alert (HART signal only) <input type="checkbox"/> On <input type="checkbox"/> Off ★ <input type="checkbox"/> Low alert _ _ _ _ _ _ _ _ (Temp. Unit -40°F, -40 °C) (-40 °C ≤ Low Alert ≤ * High Alert ≤ 85°C) *must have a 5°C difference <input type="checkbox"/> High Alert _ _ _ _ _ _ _ _ (Temp. Unit 185°F, 85 °C)

(1) Requires a C1 option code.

Product Data Sheet

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Rosemount 4600

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HART is a registered trademark of the HART Communication Foundation.
Hastelloy and Hastelloy C-276 are registered trademarks of Haynes International.*

Emerson Process Management

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