Product Data Sheet
October 2013
00813-0100-4690, Rev NB

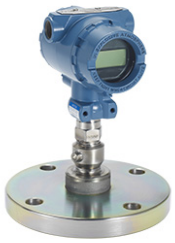
Rosemount 2088 Absolute and Gage Pressure Transmitter

- Performance of 0.065% with High Accuracy option
- Lightweight, compact design for cost-effective installation
- Protocols available include 4-20 mA HART® and 1-5 Vdc HART Low Power
- Absolute and gage pressure ranges up to 4,000 psi (276 bar)
- Rangeability of 50:1

ROSEMOUNT

EMERSON. Process Management

Rosemount 2088 Pressure Transmitter Product Offering



Proven Reliability for Gage and Absolute Applications

- Available protocols include 4-20 mA HART® and 1-5 Vdc HART Low Power
- Fully Configurable LCD to display process variable, percent of range, and diagnostic messages
- Lightweight, compact design enables easy installation
- Choice of Stainless Steel or Alloy C-276 wetted materials

Unlock the Value of Devices with the Smart Wireless THUM™ Adapter

- Gain access to field intelligence and improve quality, safety, availability, operations, and maintenance costs
- Remotely manage devices and monitor health
- Enable new wireless measurement points
- Utilize existing loop power

Proven, Reliable, and Innovative DP Level Technologies

- Connect to virtually any process with a comprehensive offering of process connections, fill fluids, direct mount or capillary connections and materials
- Quantify and optimize total system performance with QZ option

Instrument Manifolds – Quality, Convenient, and Easy

- Designed and engineered for optimal performance with Rosemount transmitters
- Save installation time and money with factory assembly
- Offers a variety of styles, materials, and configurations

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Rosemount 2088 In-line Pressure Transmitter

Configuration	Transmitter Output Code
4-20 mA HART® - 2088 with Selectable HART	S
1-5 Vdc Low Power - 2088 with Selectable HART	N

Additional Information

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Ordering Information

Table 1. Rosemount 2088 Pressure Transmitter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is manufactured after receipt of order and is subject to additional delivery lead time.

Model	Product description		
Standard			**Standard**
2088	Pressure Transmitter		★
Code	**Measurement Type**		
Standard			**Standard**
A	Absolute		★
G	Gage		★
Code	**Pressure Ranges**		
Standard			**Standard**
	2088G	**2088A**	
1	-14.7 to 30 psi /(-1,01 to 2,1 bar)	0 to 30 psi (0 to 2,1 bar)	★
2	-14.7 to 150 psi (-1,01 to 10,3 bar)	0 to 150 psi (0 to 10,3 bar)	★
3	-14.7 to 800 psi (-1,01 to 55,2 bar)	0 to 800 psi (0 to 55,2 bar)	★
4	-14.7 to 4,000 psi (-1,01 to 275,8 bar)	0 to 4,000 psi (0 to 275,8 bar)	★
Code	**Transmitter Output**		
Standard			**Standard**
S(1)	4–20 mA dc/Digital HART® Protocol		★
N(1)	1-5 Vdc Low Power/ Digital HART protocol		★

Table 1. Rosemount 2088 Pressure Transmitter Ordering Information

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The Expanded offering is manufactured after receipt of order and is subject to additional delivery lead time.

Code	Materials of Construction			
Standard				**Standard**
	Process connection	**Isolating diaphragm**	**Fill Fluid**	
22[2]	316L SST	316L SST	Silicone	★
33[2]	Alloy C-276	Alloy C-276	Silicone	★
Expanded				
2B[2]	316L SST	316L SST	Inert	
Code	**Process Connection**			
Standard				**Standard**
A	½–14 NPT Female			★
B[3]	DIN 16288 G ½ Male			★
D[3][4]	M20 × 1.5 Male			★
Expanded				
C[3][4]	RC ½ Female			
Code	**Conduit Entry**			
Standard				**Standard**
1	½–14 NPT			★
2[3]	M20 × 1.5			★
Expanded				
4[3]	G ½			

Options (Include with selected model number)

Diaphragm Seal Assemblies		
Standard		**Standard**
S1[5] [6]	Assemble to one Rosemount 1199 diaphragm seal	★
Display and Interface		
Standard		**Standard**
M4	LCD Display with Local Operator Interface	★
M5	LCD Display, configured for Engineering Units	★
Configuration Buttons		
Standard		**Standard**
D4	Analog Zero and Span	★
DZ	Digital Zero Trim	★
Mounting Brackets		
Standard		**Standard**
B4	SST mounting bracket with SST Bolts	★

Table 1. Rosemount 2088 Pressure Transmitter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is manufactured after receipt of order and is subject to additional delivery lead time.

Product Certifications		
Standard		**Standard**
C6	CSA Explosion-Proof, Intrinsically Safe, and non-Incendive	★
E2	INMETRO Flameproof	★
E3	China Flameproof	★
E4[3][7]	TIIS Flameproof	★
E5	FM Explosion-Proof, Dust Ignition-proof	★
E7	IECEx Flameproof	★
ED	ATEX Flameproof	★
I1[3]	ATEX Intrinsic Safety	★
I2	INMETRO Intrinsic Safety	★
I3	China Intrinsic Safety	★
I5	FM Intrinsically safe, Division 2	★
I7	IECEx Intrinsic Safety	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K2	INMETRO Flameproof, Intrinsic Safety	★
K5	FM Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6[3]	ATEX and CSA Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7	IECEx Flameproof, Intrinsic Safety, Type n, Dust	★
KB	FM and CSA Explosion-Proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KH[3]	FM Approvals and ATEX Explosion-Proof and Intrinsically Safe	★
N1[3]	ATEX Type n	★
N3	China Type n	★
N7	IECEx Type n	★
ND[3]	ATEX Dust	★
NK	IECEx Dust	★
Shipboard Approvals		
Standard		**Standard**
SBS	American Bureau of Shipping (ABS) Type Approval	★
SBV	Bureau Veritas (BV) Type Approval	★
SDN	Det Norske Veritas (DNV) Type Approval	★
SLL	Lloyd's Register (LR) Type Approval	★
Pressure Testing		
Expanded		
P1	Hydrostatic testing	
Terminal Blocks		
Standard		**Standard**
T1	Transient protection	★
Special Cleaning		
Expanded		
P2	Cleaning for special service	
Calibration Certificate		
Standard		**Standard**
Q4	Calibration certificate	★

Table 1. Rosemount 2088 Pressure Transmitter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
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Quality Calibration Certificate Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204 3.1	★
Q15	Certificate of Compliance to NACE MR0175/ISO 15156 for wetted materials	★
Q25	Certificate of Compliance to NACE MR0103 for wetted materials	★
Digital Signal		
Standard		**Standard**
C4[3]	NAMUR alarm and saturation levels, high alarm	★
CN[3]	NAMUR alarm and saturation levels, low alarm	★
C5[8][9]	Custom alarm and saturation levels, high alarm, (Requires C9 and Configuration Data Sheet)	★
C7[8][9]	Custom alarm and saturation levels, low alarm (Requires C9 and Configuration Data Sheet)	★
C8[9]	Low alarm (Standard Rosemount Alarm and Saturation Levels)	★
Configuration		
Standard		**Standard**
C9	Software configuration	★
Manifold Assemblies		
Standard		**Standard**
S5[5][6]	Assemble to Rosemount 306 integral manifold	★
Calibration Accuracy		
Standard		**Standard**
P8[10]	0.065% accuracy to 10:1 turndown	★
Water Approval		
Standard		**Standard**
DW[11]	NSF drinking water approval	★
Surface Finish		
Standard		**Standard**
Q16	Surface finish certification for sanitary remote seals	★
Toolkit Total System Performance Reports		
Standard		**Standard**
QZ	Remote Seal System Performance Calculation Report	★
HART Revision Configuration		
Standard		**Standard**
HR 5[9][12]	Configured for HART Revision 5	★
HR7[9][13]	Configured for HART Revision 7	★
Typical Model Number: 2088 G 2 S 22 A 1 B4 M5		

(1) HART Revision 5 is the default HART output. The 2088 with selectable HART can be factory or field configured to HART Revision 7. To order HART Revision 7 factory configured, add option code HR7.

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

(3) Not available with low-power Transmitter Output code N.

(4) Not available with Alloy C-276, Material of Construction code 33.

(5) Use $^{1}/_{2}$ - 14 NPT Female Process Connection code A.

(6) "Assemble-to" items are specified separately and require a completed model number.

(7) Only available with Conduit Thread code 4.

(8) Only available with 4-20 mA HART Output (Output Code A).

(9) Select Configuration Buttons (option code D4 or DZ) or Local Operator Interface (option code M4) if local configuration buttons are required.

(10) Requires Transmitter Output code S with either Materials of Construction code 22 or 23.

(11) Requires Materials of Construction code 22 with Process Connection code A.

(12) Configures the HART output to HART Revision 5. The device can be field configured to HART Revision 7 if needed.

(13) Configures the HART output to HART Revision 7. The device can be field configured to HART Revision 5 if needed.

Specifications

Performance Specifications

For zero-based spans, reference conditions, silicone oil fill, 316L SST isolating diaphragm.

Reference Accuracy

±0.075% of calibrated span. Includes combined effects of linearity, hysteresis, and repeatability

±0.065% of calibrated span (high accuracy option - P8)

For spans less than 10:1, accuracy =

$$\pm \left[0.009\left(\frac{URL}{Span}\right)\right] \text{ \% of Span}$$

Ambient Temperature Effect

Expressed as a total effect per 50 °F (28 °C)

Total effect includes zero and span effects.

± (0.15% URL + 0.15% of span)

Stability

Ranges 2-4: ±0.10% of URL for 3 years

Range 1: ±0.10% of URL for 1 year

Vibration Effect

Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10 - 60 Hz 0.21 mm displacement peak amplitude / 60 - 2000 Hz 3g).

Power Supply Effect

Less than ±0.005% of calibrated span per volt change in voltage at the transmitter terminals.

Mounting Position Effect

Zero shifts to ±2.5 inH_2O (6,22 mbar), which can be zeroed

Span: no effect

Transient Protection

Tested in accordance with IEEE C62.41.2-2002,

Location Category B

6 kV crest (0.5 µs - 100 kHz)

3 kA crest (8 x 20 microseconds)

6 kV crest (1.2 x 50 microseconds)

General Specifications

Tested to IEC 801-3

Functional Specifications

Table 2. 2088 Range Values

Range	Minimum Span	Upper (URL)	Lower (LRL)	Lower[(1)] (LRL) (Gage)
1	0.60 psi (41,37 mbar)	30.00 psi (2,07 bar)	0 psia (0 bar)	–14.70 psig (–1,01 bar)
2	3.00 psi (206,85 mbar)	150.00 psi (10,34 bar)	0 psia (0 bar)	–14.70 psig (–1,01 bar)
3	16.00 psi (1,11 bar)	800.00 psi (55,16 bar)	0 psia (0 bar)	–14.70 psig (–1,01 bar)
4	80.00 psi (5,52 bar)	4000.00 psi (275,79 bar)	0 psia (0 bar)	–14.70 psig (–1,01 bar)

(1) Assumes atmospheric pressure of 14.70 psia (1,01 bar-a).

Output

Code S: 4–20 mA

Code N: 1-5 Vdc, low power

(Outputs are directly proportional to the input pressure)

Selectable HART

Digital communications based on HART Revision 5 (default) or Revision 7 (option code HR7) protocol can be selected. The HART revision can be switched in the field using any HART based configuration tool or the optional local operator interface (LOI).

Service

Liquid, gas, and vapor applications

Power Supply

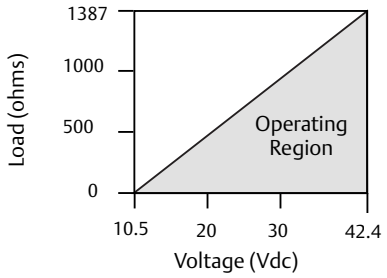
External power supply required. Transmitter operates on 10.5–42.4 Vdc with no load (5.8-28 V for Low Power). Reverse polarity protection is standard.

Load Limitations

Reverse polarity protection is standard. Maximum loop resistance is determined by the power supply voltage as described by the following equations:

Figure 1. Maximum loop resistance

Max. Loop Resistance = 43.5 (Power Supply Voltage – 10.5)



The Field communicator requires a minimum loop resistance of 250W for communication.

Indication

Optional two line LCD/LOI Display.

Zero and Span Adjustment Requirements

Zero and span values can be set anywhere within the range limits stated in Table 2 on page 8. Span must be greater than or equal to the minimum span stated in Table 2 on page 8.

Local Operator Interface

The LOI utilizes a 2 button menu with internal and external configuration buttons. Internal buttons are always configured for Local Operator Interface. External Buttons can be configured for either LOI, (option code M4), Analog Zero and Span (option code D4) or Digital Zero Trim (option code DZ) for LOI configuration menu.

Current Draw

Output Code N: ≤ 3 mA.

Overpressure Limits

Range 1: 120 psig max
All other ranges: two times the URL

Burst Pressure

11,000 psi for all ranges

Zero Elevation and Suppression

Zero can be suppressed between atmosphere for gage transmitters or 0 psia for absolute transmitters and upper range limit, provided the calibrated span is equal to or greater than the minimum span, and the upper range value does not exceed the upper range limit.

Dynamic Performance

Total Response Time: 145 milliseconds
Update rate: 20 times per second minimum

Temperature Limits

Ambient:

-40 to 185 °F (–40 to 85 °C)
With LCD display[1]: -40 to 176 °F (–40 to 80 °C)

Storage[1]:

-50 to 230 °F (-46 to 110 °C)
With LCD display: –40 to 185 °F (–40 to 85 °C)

Process

Silicone fill sensor: –40 to 250 °F (–40 to 121 °C)[2]
Inert fill sensor: –22 to 250 °F (–30 to 121 °C)[2]

Process temperatures above 185 °F (85 °C) require derating the ambient limits by a 1.5:1 ratio. For example, for process temperature of 195 °F (91 °C), new ambient temperature limit is equal to 170 °F (77 °C). This can be determined as follows: (195 °F - 185 °F) x 1.5 = 15 °F, 185 °F - 15 °F = 170 °F

Humidity Limits

0–100% relative humidity

Volumetric Displacement

Less than 0.0005 in^3 (0,008 cm^3)

Damping

Analog output response time to a step change is user-selectable from 0 to 60 seconds for one time constant. Software damping is in addition to sensor module response time.

Turn-on Time

2.0 seconds, no warm-up required

Transmitter Security

Activating the transmitter security function prevents changes to the transmitter configuration, including local zero and span adjustments. Security is activated by an internal switch.

Failure Mode Alarm

If self-diagnostics detect a sensor or microprocessor failure, the analog signal will be driven either high or low to alert the user. High or low failure mode is user-selectable with a jumper on the transmitter. The values to which the transmitter drives its output in failure mode depend on whether it is factory-configured to *standard* or *NAMUR-compliant* operation. The values for each are as follows:

Standard Operation			
Output Code	**Linear Output**	**Fail High**	**Fail Low**
S	3.9 ≤ I ≤ 20.8	I ≥ 21.75 mA	I ≤ 3.75 mA
N	0.97 ≤ V ≤ 5.2	V ≥ 5.4 V	V ≤ 0.95 V

NAMUR-Compliant Operation			
Output Code	**Linear Output**	**Fail High**	**Fail Low**
S	3.8 ≤ I ≤ 20.5	I ≥ 22.5 mA	I ≤ 3.6 mA

(1) If storage temperature is above 85 °C, perform a sensor trim prior to installation.

(2) 220 °F (104 °C) limit in vacuum service; 130 °F (54 °C) for pressures below 0.5 psia.

Physical Specifications

Electrical Connections

1/2–14 NPT, M20 × 1.5 (CM20), or
G 1/2 female (PF 1/2 female) conduit entry

Process Connections

1/2–14 NPT female, DIN 16288 G 1/2 male, RC 1/2 female
(PT 1/2 female), M20 × 1.5 (CM20) male

Process-Wetted Parts

Isolating Diaphragm

316L SST (UNS S31603), Alloy C-276 (UNS N10276)

Process Connector

316L stainless steel CF-3M (Cast version of 316L SST, material per ASTM_A743) or Alloy C-276

Non-Wetted Parts

Electronics Housing

Low-copper aluminum, NEMA 4X, IP65, IP67,
CSA enclosure Type 4X

Paint for Aluminum Housing

Polyurethane

Cover O-rings

Buna-N

Fill Fluid

Silicone or inert fill

Weight

Output Code S and N: Approximately 2.44 lb (1, 11 kg)

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota, USA
Emerson Process Management GmbH & Co. — Wessling, Germany
Emerson Process Management Asia Pacific Private Limited — Singapore
Beijing Rosemount Far East Instrument Co., LTD — Beijing, China

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found at www.rosemount.com. A hard copy may be obtained by contacting an Emerson Process Management representative.

ATEX Directive (94/9/EC)
Emerson Process Management complies with the ATEX Directive.

European Pressure Equipment Directive (PED) (97/23/EC)
2088/2090 Pressure Transmitters
— Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (2004/108/EC)
EN 61326-1:2006

Hazardous Locations Certifications

North American Certifications
FM Approvals

E5 Explosion-proof and Dust Ignition Proof
Certificate No.: 1V2A8.AE
Applicable Standards: FM Class 3600 - 1998, FM Class 3615 - 1989, FM Class 3810 - 1989
Markings: Explosion-proof for Class I, Division 1, Groups B, C, and D. Dust Ignition-Proof for Class II/III, Division 1, Groups E, F and G.
Temperature Code: T5 (Ta = -40 °C to + 85 °C) Factory Sealed, Enclosure Type 4X.
For input parameters see control drawing 02088-1018.

I5 Intrinsically Safe and Non-Incendive
Certificate No.: 0V9A7.AX
Applicable Standards: FM Class 3600 - 1998, FM Class 3610 - 2010, FM Class 3811 - 2004, FM Class 3810 - 1989.
Markings: Intrinsically safe for use in Class I, Division 1, Groups A, B, C, D; Class II, Division 1, Groups E, F, and G; and Class III, Division 1
Temperature Code: T4 (T_a = 70 °C) in accordance with Rosemount drawing 02088-1018.
Non-incendive for Class I, Division 2, Groups A, B, C, and D.
Temperature Code: T4 (T_a = 85 °C), Enclosure Type 4X.
For input parameters see control drawing 02088-1018.

Canadian Standards Association (CSA)

All CSA hazardous approved transmitters are certified per ANSI/ISA 12.27.01-2003.

C6 Explosion-Proof, Intrinsically Safe, Dust Ignition-Proof and Class I Division 2
Applicable Standards: CAN/CSA Std. C22.2 No. 0-M91, CSA Std. C22.2 No. 25 - 1966, CSA Std. C22.2 No. 30 - M1986, CAN/CSA Std. C22.2 No. 94 - M91, CSA Std. C22.2 No. 142 - M1987, CAN/CSA Std. C22.2 No. 157-92, CSA Std. C22.2 No. 213 - M1987, ANSI/ISA 12.27.01-2003.
Markings: Explosion-proof for Class I, Division 1, Groups B, C, and D.
Dust-Ignition-Proof for Class II, Division 1, Groups E, F, G, Class III.
Suitable for Class I, Division 2, Groups A, B, C, and D.
Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D. Temperature Code: T3C.
Enclosure Type 4X. Factory sealed. Single Seal. See control drawing 02088-1024.

European Certifications

ED ATEX Flameproof
Certification No.: KEMA97ATEX2378X
Applicable Standards: EN60079-0:2006, EN60079-1:2007, EN60079-26:2007
Markings: Ⓔx II 1/2 G
Ex d IIC T6 (-40 °C ≤ T_{amb} ≤ 40 °C); T4 (-40 °C ≤ T_{amb} ≤ 80 °C)
CE 1180
Vmax = 36 (with Output Code S)
Vmax = 14 (with Output Code N)

Special Conditions for Safe Use (x):

1. The cable and conduit entry devices shall be of a certified flameproof type Ex d, suitable for the conditions of use and correctly installed.
2. With the use of conduit entries a sealing device shall be provided immediately on the entrance thereto.
3. Unused apertures shall be closed with suitable Ex d certified blanking elements.
4. Suitable heat-resisting cables shall be used when the ambient temperature at the cable or conduit entries exceed 65 °C.
5. 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.
6. For information on the dimensions of the flameproof joints the manufacturer shall be contacted.

I1 ATEX Intrinsic Safety
Certificate No.: BAS00ATEX1166X
Applicable Standards: EN60079-0:2012, EN60079-11: 2012
Markings: ⟨Ex⟩ II 1 G
Ex ia IIC T5 Ga (–55 °C ≤ T_{amb} ≤ 40 °C)
Ex ia IIC T4 Ga (–55 °C ≤ T_{amb} ≤ 70 °C)
CE 1180

Table 3. Input Parameters

U_i = 30 V
I_i = 200 mA
P_i = 0.9 W
C_i = 0.012 µF

Special Conditions For Safe Use (x):

1. The apparatus is not capable of withstanding the 500V insulation test required by EN60079-11. This must be taken into account when installing the apparatus.

N1 ATEX Non-incendive/Type n
Certification No.: BAS 00ATEX3167X
Applicable Standards: EN60079-0:2012, EN60079-15: 2010
Markings: ⟨Ex⟩ II 3 G
Ex nA IIC T5 Gc (–40 °C ≤ T_{amb} ≤ 70 °C)
U_i = 50 Vdc max
CE1180

1. **Special Conditions For Safe Use (x):**
The apparatus is not capable of withstanding the 500V insulation test required by EN60079-15. This must be taken into account when installing the apparatus.

ND ATEX Dust
Certificate No.: BAS01ATEX1427X
Applicable Standards: EN60079-0:2012, EN60079-31: 2009
Markings: ⟨Ex⟩II 1 D
Ex t IIIC T50 °C T_{500} 60 °C Da
Vmax = 36 Vdc; Ii = 24 mA
CE 1180

Special Conditions For Safe Use (x):

1. The user must ensure that the maximum rated voltage and current (36 volts, 24 mA, D.C.) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category "ib" circuit according to EN50020.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact test.
5. The 2088/2090 sensor module must be securely screwed in place to maintain the ingress protection of the enclosure.

IECEx Certifications

E7 IECEx Flameproof
Certificate No.: IECEx KEM 06.0021X
Applicable Standards: IEC60079-0:2004, IEC60079-1:2003, IEC60079-26:2004
Markings: Ex d IIC T4 (-20 °C ≤ T_{amb} ≤ 80 °C)
Ex d IIC T6 (–20 °C ≤ T_{amb} ≤ 40 °C)

I7 IECEx Intrinsic Safety
Certificate No.: IECEx BAS 12.0071X
Applicable Standards: IEC60079-0:2011, IEC60079-11:2011
Markings: Ex ia IIC T5 Ga(-55 °C ≤ T_{amb} ≤ +40 °C)
Ex ia IIC T4 Ga (–55 °C ≤ T_{amb} ≤ +70 °C)

Table 4. Input Parameter

U_i = 30 V
I_i = 200 mA
P_i = 0.9 W
C_i = 0.012 µF

Special Conditions for Safe Use (x):

1. The equipment is not capable of withstanding the 500V insulation test required by EN60079-11. This must be taken into account when installing the equipment.

N7 IECEx Non-incendive/Type n
Certificate No.: IECEx BAS 12.0072X
Applicable Standards: IEC60079-0:2011, IEC60079-15: 2010
Markings: Ex nA IIC T5 Gc (-40 °C ≤ T_{amb} ≤ +70 °C)
U_i =50 Vdc max

Special Conditions for Safe Use (x):

1. When fitted with a transient suppression terminal block, the Model 2088 is incapable of passing the 500V isolation test. This must be taking into account during installation.

NK IECEx Dust
Certificate No.: IECEx BAS12.0073X
Applicable Standards: IEC60079-0:2011, IEC60079-31: 2008
Markings: Ex t IIIC T50 °C T_{500} 60 °C Da
Vmax = 36 Vdc; Ii = 24 mA

Special Conditions For Safe Use (x):

1. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
2. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
3. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact.

Japanese Certifications

E4 TIIS Flameproof
Ex d IIC T6 (T_{amb} = 85 °C)

Certificate	Description
TC15874	2088 with Alloy C-276 wetted parts (with display)
TC15873	2088 with Alloy C-276 wetted parts (no display)
TC15872	2088 with SST wetted parts (with display)
TC15871	2088 with SST wetted parts (no display)

Brazil Certifications

I2 INMETRO Intrinsic Safety
Certification No.: UL-BR 13.0246
Markings: Ex ia IIC T5/T4 Ga
T5 (-55 °C ≤ T_{amb} ≤ +40 °C); T4 (-55 °C ≤ T_{amb} ≤ +70 °C)

Special Conditions For Safe Use (x):

1. When fitted with a transient suppression terminal block, the model 2088 is incapable of passing the 500V isolation test. This must be taken into account during installation.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 environment.

E2 INMETRO Flameproof (2088 Series only)
Certification No.: CEPEL 97.0076
Markings: Ex d IIC T6/T5 Gb
T6 (-20 °C ≤ T_{amb} ≤ +40 °C); T5 (-20 °C ≤ T_{amb} ≤ +60 °C)

China Certifications

I3 China Intrinsic Safety
Certification No.: GYJ111063X (2088 Series); GYJ111065X (2090 Series)
Applicable Standards: GB3836.1-2000, GB3836.4-2000
Markings: Ex ia IIC T4/T5
T4 (-55 °C ≤ T_{amb} ≤ +70 °C);T5 (-55 °C ≤ T_{amb} ≤ +40 °C)

Table 5. Input Parameters

U_i = 30 V
I_i= 200 mA
P_i= 0.9 W
C_i = 0.012 µF

Refer to Appendix B of the 2088/2090 Reference Manual (document number 00809-0100-4690) for Special Conditions for Safe Use

E3 China Flameproof
Certificate No.: GYJ111062 (2088 Series); GYJ111064 (2090 Series)
Applicable Standards: GB3836.1-2000, GB3836.2-2000
Markings: Ex d IIC T4/T6
T4 (-20 °C ≤ Tamb ≤ +40 °C); T6 (-20 °C ≤ Tamb ≤ +80 °C)

Refer to Appendix B of the 2088/2090 Reference Manual (document number 00809-0100-4690) for Special Conditions for Safe Use.

N3 China Type n Non-Sparking
Certification No.: GYJ101126X (2088 Series)
Applicable Standards: GB3836.1-2000, GB3836. 8-2000
Markings: Ex nA nL IIC T5 (-40 °C ≤ T_{amb} ≤ +70 °C)

Refer to Appendix B of the 2088/2090 Reference Manual (document number 00809-0100-4690) for Special Conditions for Safe Use.

Combinations of Certifications

Stainless steel 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 I1, N1, ED, and ND combination

K2 I2 and E2 combination

K5 E5 and I5 combination

K6 C6, I1, and ED combination

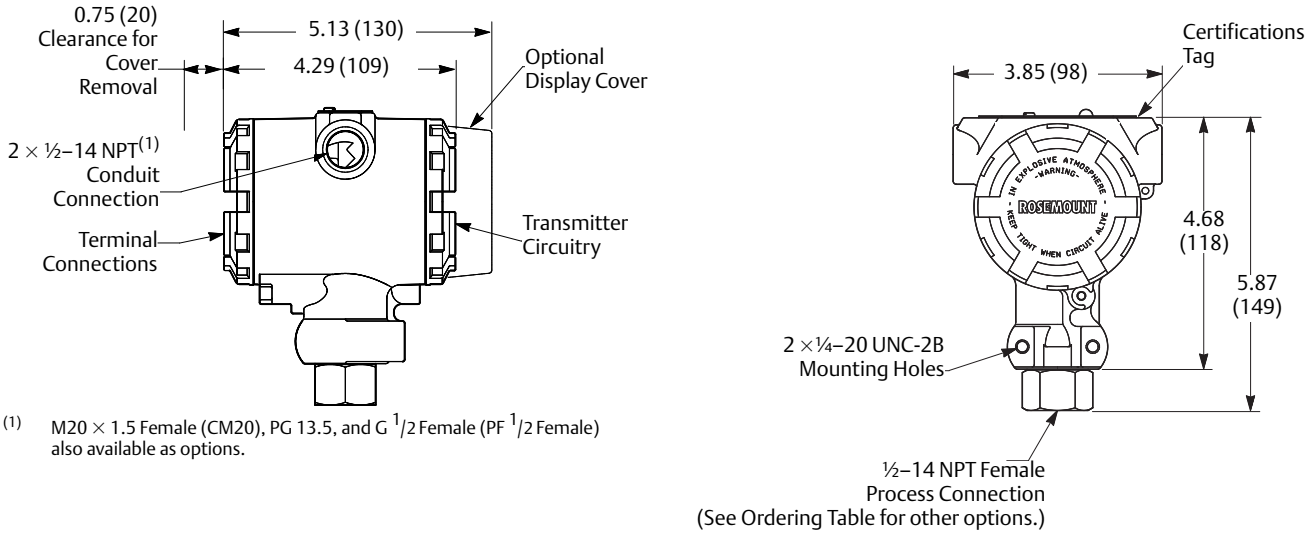
K7 I7, N7, E7, and NK combination

KB K5 and C6 combination

KH K5, ED, and I1 combination

Dimensional Drawings

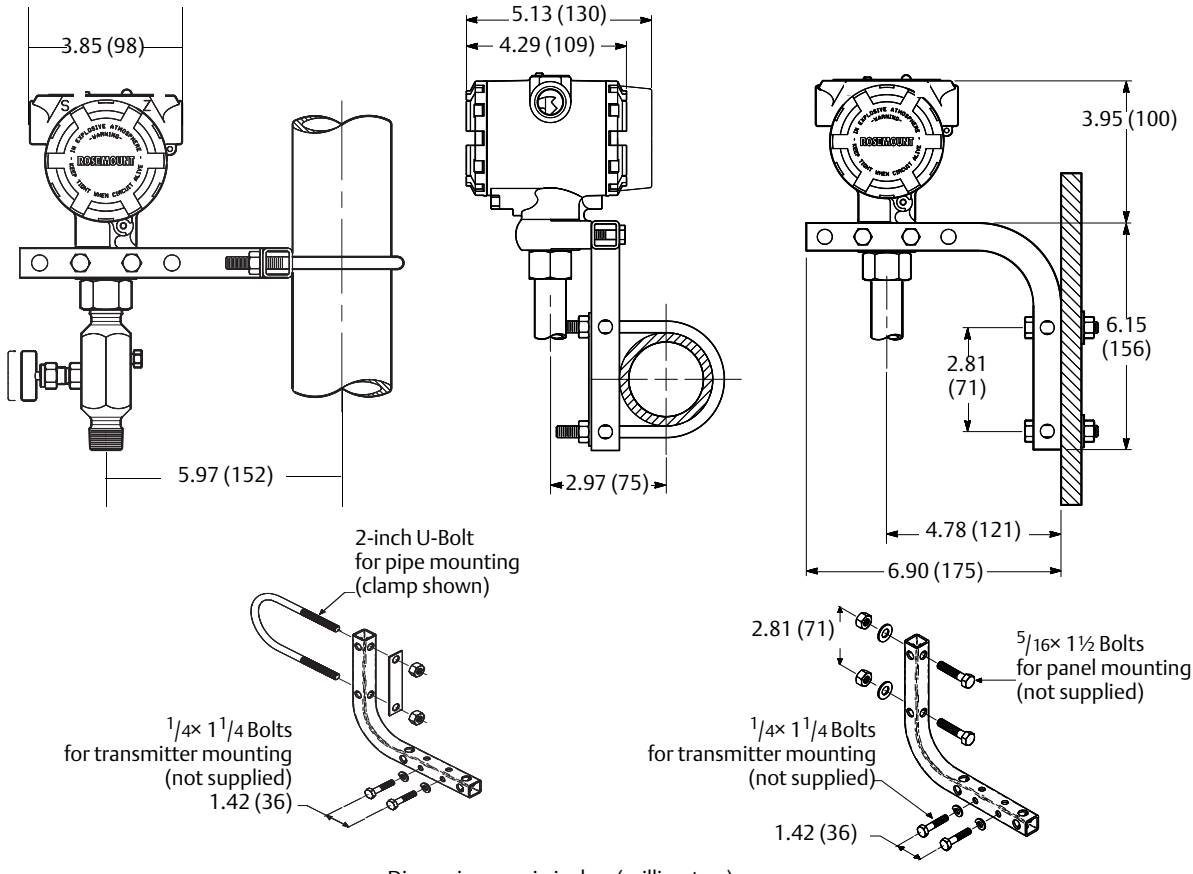
Rosemount 2088



(1) M20 × 1.5 Female (CM20), PG 13.5, and G $^{1}/_{2}$ Female (PF $^{1}/_{2}$ Female) also available as options.

Mounting Configurations with Optional Mounting Brackets

Pipe Mounting **Panel Mounting**



Dimensions are in inches (millimeters).

Options

Standard Configuration

Unless otherwise specified, transmitter is shipped as follows:

ENGINEERING UNITS	psi (all ranges)
4 mA (1 Vdc):	0 (engineering units)
20 mA (5 Vdc):	Upper range limit
Output:	Linear
Flange type:	Specified model code option
Flange material:	Specified model code option
O-ring material:	Specified model code option
Drain/vent:	Specified model code option
LCD Display:	Installed or none
Alarm:	High
Software tag:	(Blank)

Custom Configuration

If Option Code C9 is ordered, the customer may specify the following data in addition to the standard configuration parameters.

- Output Information
- Transmitter Information
- LCD display Configuration
- Hardware Selectable Information
- Signal Selection

Refer to the "Rosemount 2088 Configuration Data Sheet" document number 00806-0100-4690.

Tagging (3 options available)

- Standard SST hardware tag is permanently affixed on transmitter. Tag character height is 0.125 in. (3,18 mm), 84 characters maximum.
- Tag may be wired to the transmitter nameplate upon request, 85 characters maximum.
- For HART protocols, the tag may be stored in transmitter memory (eight characters maximum). Software tag is left blank unless specified.
- HART Revision 5: 8 characters
- HART Revision 7: 32 characters

Optional Rosemount 306 Integral Manifold

Factory assembled to 2088 transmitters. Refer to Product Data Sheet (document number 00813-0100-4733 for Rosemount 306) for additional information.

Other Seals

Refer to Product Data Sheet (document number 00813-0100-4016 or 00813-0201-4016) for additional information.

Output Information

Output range points must be the same unit of measure. Available units of measure include:

Pressure Units(1)		
torr	psf(1)	cmH_2O@4°C(1)
atm	inH_2O	mH_2O@4°C(1)
Pa	inH_2O@4°C(1)	inHg
kPa	inH_2O@60°F(1)	mmHg
MPa(1)	ftH_2O	cmHG@0°C(1)
hPa(1)	ftH_2O@4°C(1)	mHG@0°C(1)
mbar	ftH_2O@60°F(1)	g/cm^2
bar	mmH_2O	kg/m^2(1)
psi	mmH_2O@4°C(1)	kg/cm^2

(1) Field configurable only, not available for factory calibration or custom configuration (option code C9 "Software configuration").

Display and Interface Options

M4 Digital Display with Local Operator Interface (LOI)

- Available for 4-20 mA HART, 4-20 mA HART Low Power

M5 Digital Meter

- 2-Line, 5-Digit LCD for 4-20 mA HART
- 2-Line, 5-Digit LCD for 1-5 Vdc HART Low Power
- Direct reading of digital data for higher accuracy
- Displays user-defined flow, level, volume, or pressure units
- Displays diagnostic messages for local troubleshooting
- 90-degree rotation capability for easy viewing

Configuration Buttons

Rosemount 2088 now offers optional internal and external configuration buttons.

- Choosing option D4 will add external Analog Zero and Span configuration buttons
- Choosing option DZ will add an external Digital Zero Trim configuration button
- Choosing option M4 (LOI) adds both internal and external local configuration buttons.

Certain button options can also be combined as shown below:

Button Configuration		
Option Codes	**Internal**	**External**
DZ	N/A	Digital Zero Trim
D4	N/A	Analog Zero & Trim
M4	LOI	LOI
M4 + DZ	LOI	Digital Zero Trim
M4 + D4	LOI	Analog Zero & Trim

Rosemount 2088 Bracket Option

B4 Bracket for 2-in. Pipe or Panel Mounting

- Bracket for mounting of transmitter on 2-in. pipe or panel
- Stainless steel construction with stainless steel bolts

Emerson Process Management
Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN 55317 USA
T (U.S.) 1-800-999-9307
T (International) (952) 906-8888
F (952) 906-8889
www.rosemount.com

Emerson Process Management
Blegistrasse 23
P.O. Box 1046
CH 6341 Baar
Switzerland
T +41 (0) 41 768 6111
F +41 (0) 41 768 6300
www.rosemount.com

Emerson Process Management
Asia Pacific Pte Ltd
1 Pandan Crescent
Singapore 128461
T +65 6777 8211
F +65 6777 0947
Service Support Hotline: +65 6770 8711
Email: Enquiries@AP.EmersonProcess.com
www.rosemount.com

Emerson Process Management
Latin America
1300 Concord Terrace, Suite 400
Sunrise Florida 33323 USA
Tel + 1 954 846 5030
www.rosemount.com

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