Product Data Sheet
February 2013
00813-0100-4690, RevMB

Rosemount 2088 Absolute and Gage Pressure Transmitter

HART COMMUNICATION PROTOCOL CE

- Performance of 0.075% 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 20:1

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

Contents

Rosemount 2088 In-line Pressure Transmitter

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

(1) The 4-20 mA with Selectable HART device can be ordered with transmitter output code S or N plus any of the following option codes: M4, DZ, C5, C7, C8, HR5, and HR7.

Additional Information

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		★

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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 (CM20 Male)			★
Expanded				
C[3][4]	RC ½ Female (PT ½ Female)			
Code	**Conduit Entry**			
Standard				**Standard**
1	½–14 NPT			★
2[3]	M20 × 1.5 Female			★
Expanded				
4[3]	G ½ Female (PF ½ Female)			

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 percent of range	★
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.

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Product Certifications		
Standard		**Standard**
C6	CSA Explosion-Proof, Intrinsically Safe, and non-Incendive	★
E2	INMETRO 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	★
I5	FM Intrinsically safe, Division 2	★
I7	SAA Intrinsic Safety	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
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	SAA Intrinsic Safety and Type n; IECEx Flameproof and 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	★
N7	SAA 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.

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

Quality Calibration Certificate Traceability Certification		
Standard		**Standard**
Q8	Material Traceability Certification per EN 10204 3.1	★
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)	0.075% 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	★
Toolkit Total System Performance Reports		
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 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) Available with Output code S, stainless steel isolators, and silicone fill.

(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

(Zero-based spans, reference conditions, silicone oil fill, and 316L SST isolating diaphragm.)

Reference Accuracy

- ±0.10% of calibrated span. Includes combined effects of linearity, hysteresis, and repeatability
- ±0.075% of calibrated span (high accuracy option - P8)

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) from –40 °F to 185 °F
(-40 °C to 85 °C)

Stability

±0.10% of URL for 12 months

Vibration Effect

Less than ±0.1% of URL when subjected to vibration of: peak to peak constant displacement of 4 mm (5–15 Hz) and constant acceleration of 2 g (15–150 Hz) and 1 g (150–2000 Hz).

Power Supply Effect

Less than 0.01% of calibrated span per volt

Mounting Position Effect

Zero shift of up to 1.2 inH_2O (0.30 kPa), which can be calibrated out. No span effect.

Transient Protection Limits

IEEE C62.41-2002 Category B Ring Wave

6 kV Crest (0.5 µs) Combination Wave
3 kA Crest (8/20 µs)
6 kV Crest (1.2/50 µs)

IEEE 472

SWC 2.5 kV Crest,1 MHz waveform

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	1.50 psi (103,42 mbar)	30.00 psi (2,07 bar)	0 psia (0 bar)	–14.70 psig (–1,01 bar)
2	7.50 psi (517,11 bar)	150.00 psi (10,34 bar)	0 psia (0 bar)	–14.70 psig (–1,01 bar)
3	40.00 psi (2,76 bar)	800.00 psi (55,16 bar)	0 psia (0 bar)	–14.70 psig (–1,01 bar)
4	200.00 psi (13,79 bar)	4000.00 psi (275,79 bar)	0 psia (0 bar)	–14.70 psig (–1,01 bar)

(1) Assumes atmospheric pressure of 14.7 psig.

Output

Code S: 4–20 mA dc
Code N: 1-5 volt dc, low power
(Outputs are directly proportional to the input pressure)

2088

Digital communications based on HART Revision 5 protocol.

2088 with Selectable HART

The 2088 with Selectable HART comes with Selectable HART Revisions. 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

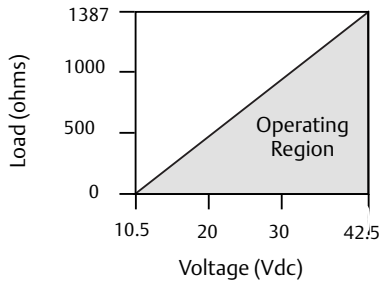
External power supply required. Transmitter operates on 10.5–42.5 Vdc with no load (5.8-28 V for Low Power). Reverse polarity protection is standard.

Load Limitations

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

Table 3.

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



The Field communicator requires a minimum loop resistance of 250Ω 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 0100-4108) 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.

Time Response
Time Constant: 200 milliseconds
Dead time: < 0.1 s
Update rate: 20 times per second minimum

Temperature Limits

Ambient:
–40 to 185 °F (–40 to 85 °C)
–With LCD display(1): -40 to 175 °F (–40 to 80 °C)

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

Storage(1):
–50 to 230 °F (–40 to 85 °C)
–With LCD display: –40 to 185 °F (–40 to 85 °C)

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

Process:
Silicone fill sensor: –40 to 250 °F (–40 to 121 °C)(1)
Inert fill sensor: –22 to 250 °F (–30 to 121 °C)(1)
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

(1) 250 °F (140 °C) limit in vacuum service; 130 °F (54 °C) for pressures below 0.5 psia.

Humidity Limits
0–100% relative humidity

Volumetric Displacement
Less than 0.00042 cm^3

Damping

2088 with Selectable HART

Analog output response to a step input change is user-enterable from 0.0 to 60 seconds for one time constant. This software damping is in addition to sensor module response time.

2088

Analog output response to a step input change is user-enterable from 0.0 to 36 seconds for one time constant. This 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
If self-diagnostics detect a sensor or microprocessor failure, the analog signal is 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	**Linear Output**	**Fail High**	**Fail Low**
Output Code S	3.8 ≤ I ≤ 20.5	I ≥ 22.5 mA	I ≤ 3.6 mA

Physical Specifications

Electrical Connection

$^1/_2$–14 NPT, M20 × 1.5 (CM20), or
G $^1/_2$ female (PF $^1/_2$ female) conduit entry

Process Connection

$^1/_2$–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 stainless steel or Alloy C-276

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

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 can be found at www.rosemount.com.

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)
All Model 2088/2090 Pressure Transmitter:
EN 61326-1:2006

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM)

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 II 1 G
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 4. 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):
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: EN60079-0:202012, EN60079-15: 2010
Markings: Ex II 3 G
Ex nA nL IIC T5 (–40 °C ≤ T_{amb} ≤ 70 °C)
U_i = 50 Vdc max
CE1180

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 6 (–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 5. 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: EN60079-0:202012, EN60079-15: 2010
Markings: Ex nA IIC T5 Gc (-40 °C ≤ T_{amb} ≤ +70 °C)
U_i =50 Vdc max

Table 6. 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.

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. The 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.
2. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP 66.
3. Unused cable entries must be used which maintain the ingress protection of the enclosure to at least IP 66.
4. Cable entries and blanking plugs must be suitable for the ambient range of the apparatus and capable of withstanding a 7J impact.
5. The 2088/2090 sensor module must be securely screwed in place to maintain the ingress protection of the enclosure.

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.: CEPEL 97.0063X
Markings: Ex ia IIC T5/T4 Gb
T5 (-20 °C ≤ T_{amb} ≤ +40 °C);T4 (-20 °C ≤ T_{amb} ≤ +70 °C)

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 7. 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

K5 E5 and I5 combination

K6 C6, I1, and ED combination

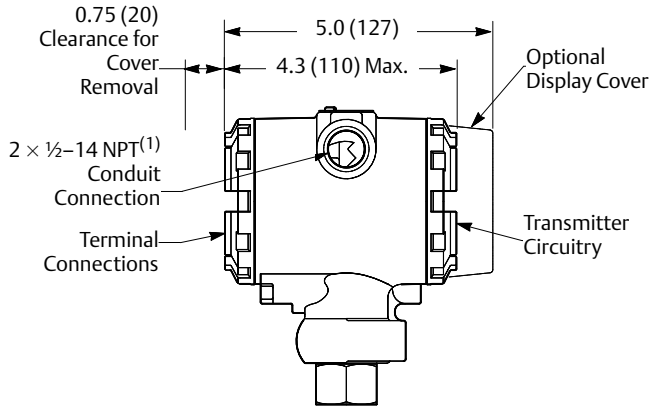
K7 I7, N7, E7, and NK combination

KB K5 and C6 combination

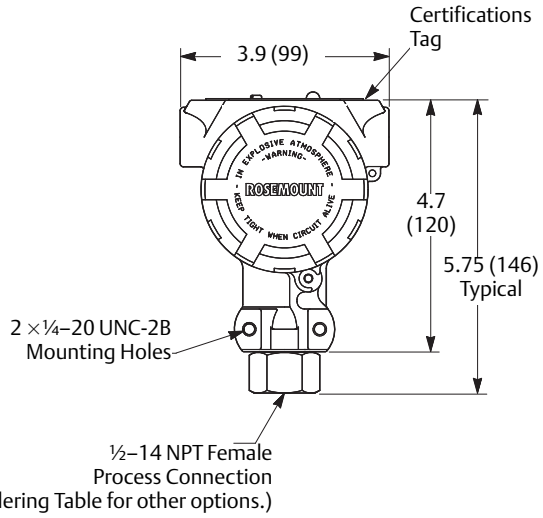
KH K5, ED, and I1 combination

Dimensional Drawings

Rosemount 2088

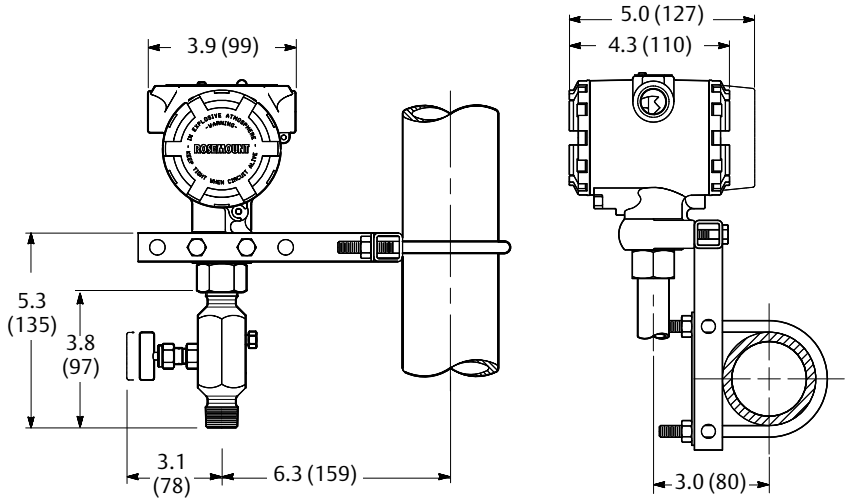


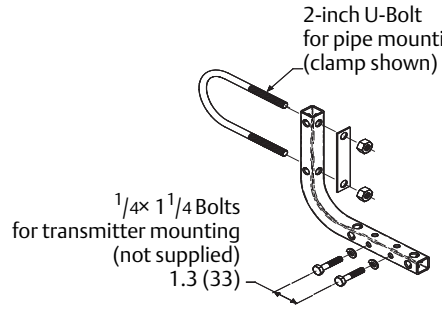
(1) M20 × 1.5 Female (CM20), PG 13.5, and G 1/2 Female (PF 1/2 Female) also available as options.



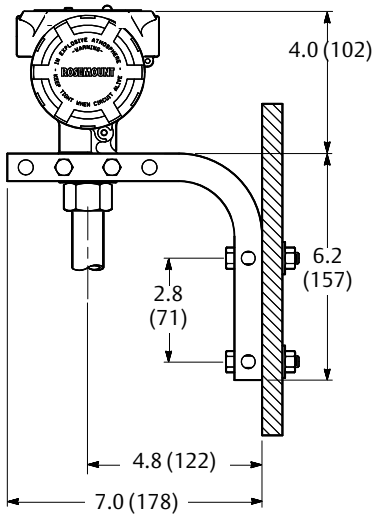
Mounting Configurations with Optional Mounting Brackets

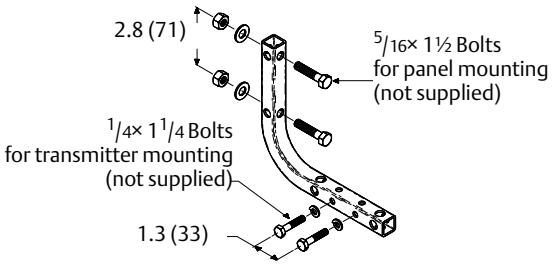
Pipe Mounting





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:

atm	inH_2O @4 °C(1)	g/cm2	psi
mbar	mmH_2O	kg/cm2	torr
bar	mmHg	Pa	cmH_2O@4 °C(1)
inH_2O	mmH_2O@4 °C(1)	kPa	cmHG@0 °C(1)
inHg	ftH_20	MPa(1)	ft H_2O @ 60 °F(1)
hPa(1)	inH_2O@60 °F(1)	kg/SqM(1)	mH_2O@4 °C(1)
mHg@0 °C(1)	Psf(1)	ftH_2O@4 °C(1)	

(1) Available with enhanced 3051 and Wireless.

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 Requires option D4 (Analog Zero and Span), option DZ (Digital Trim), or option M4 (LOI) for local configuration buttons.

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

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