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Find the *Emerson / Rosemount Analytical 2088 G1S22A1B4E5Q4P0021* at our website: *Click HERE*

Product Data Sheet
00813-0100-4690, Rev PF
July 2019

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 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 display 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 Emerson 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

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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

Ordering information

Rosemount 2088 In-line Pressure Transmitter

	Configuration	Transmitter output code
	4–20 mA HART Rosemount 2088 with Selectable HART	S
	1–5 Vdc Low Power Rosemount 2088 with Selectable HART	N

Additional information

Specifications

Product Certifications

Dimensional drawings

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See Material selection for more information on material selection.

Table 1: Rosemount 2088 Pressure Transmitter Ordering Information

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Model	Product description			
2088	Pressure Transmitter			★
Measurement type				
A	Absolute			★
G	Gage			★
Pressure ranges				
	Rosemount 2088G		Rosemount2088A	
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)	★
Transmitter output[1]				
S	4–20 mA dc/Digital HART Protocol			★
N	1–5 Vdc Low Power/Digital HART Protocol			★
Materials of construction[2]				
	Process connection	Isolating diaphragm	Fill fluid	
22	316L SST	316L SST	Silicone	★

Table 1: Rosemount 2088 Pressure Transmitter Ordering Information *(continued)*

33	Alloy C-276	Alloy C-276	Silicone	★
2B	316L SST	316L SST	Inert	
Process connection				
A	1/2–14 NPT female			★
B(3)	DIN 16288 G 1/2 male			★
D(3) (4)	M20 3 1.5 male			★
C(3) (4)	RC 1/2 female			
Conduit entry				
1	1/2–14 NPT			★
2(3)	M20 3 1.5			★
4(3) (5)	G 1/2			

(1) HART Revision 5 is the default HART output. The Rosemount2088 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, materials of construction code 33.

(5) Consists of a 1/2–14 NPT housing with a G1/2 adapter.

Table 2: Options (Include with selected model number)

Extended Product Warranty		
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★
Diaphragm Seal Assemblies(1) (2)		
S1	Assemble to one Rosemount 1199 Diaphragm Seal	★
Display and Interface		
M4	LCD display with local operator interface	★
M5	LCD display, configured for engineering units	★
Configuration Buttons		
D4	Analog zero and span	★
DZ	digital zero trim	★
Mounting Brackets		
B4	SST mounting bracket with SST bolts	★
Product Certifications		
C6	Canada Explosionproof, Intrinsic Safety, Division 2, and Dust-Ignitionproof	★
E2	INMETRO Flameproof	★
E3	China Flameproof	★
E4(3) (4)	Japan Flameproof	★
E5	USA Explosionproof (XP) and Dust-Ignitionproof (DIP)	★

Table 2: Options (Include with selected model number) *(continued)*

E7	IECEx Flameproof	★
ED	ATEX Flameproof	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
I1[3]	ATEX Intrinsic Safety	★
I2	INMETRO Intrinsic Safety	★
I3	China Intrinsic Safety	★
I5	USA Intrinsic Safety (IS) and Nonincendive (NI)	★
I7	IECEx Intrinsic Safety	★
IM	Technical Regulation Customs Union (EAC) Intrinsic Safety	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K2	INMETRO Flameproof, Intrinsic Safety	★
K5	USA Explosionproof, Dust-Ignitionproof, Intrinsic Safety, and Nonincendive	★
K6[3]	Canada Explosion-Proof, Intrinsic Safety, Division 2, Dust-ignitionproof, and ATEX Flameproof, Intrinsic Safety	★
K7	IECEx Flameproof, Intrinsic Safety, Type n, Dust	★
KB	USA Explosionproof, Dust-Ignitionproof, Intrinsic Safety, Nonincendive, and Canada Explosionproof, Dust-Ignitionproof, Intrinsic Safety, Division 2	★
KM	Technical Regulation Customs Union (EAC) Flameproof and Intrinsic Safety	★
KH[3]	ATEX Flameproof, Intrinsic Safety, and USA Explosion-Proof, Dust Ignitionproof, Intrinsic Safety, and Nonincendive	★
N1[3]	ATEX Type n	★
N3	China Type n	★
N7	IECEx Type n	★
ND[3]	ATEX Dust	★
NK	IECEx Dust	★
Shipboard Approvals		
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		
P1	Hydrostatic testing	
Terminal Blocks		
T1	Transient protection	★
Special Cleaning		
P2	Cleaning for special service	
Calibration Certificate		
Q4	Calibration certificate	★

Table 2: Options (Include with selected model number) *(continued)*

Quality Calibration Certificate Traceability Certification		
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		
C4(3)	NAMUR alarm and saturation levels, high alarm	★
CN(3)	NAMUR alarm and saturation levels, low alarm	★
C5 (5) (6)	Custom alarm and saturation levels, high alarm (requires C9 and Configuration Data Sheet)	★
C7(5) (6)	Custom alarm and saturation levels, low alarm (requires C9 and Configuration Data Sheet)	★
C8(6)	Low alarm (Standard Rosemount alarm and saturation levels)	★
Conduit plug(7)		
DO	316 SST conduit plug	★
Configuration		
C9	Software configuration	★
Manifold Assemblies(1) (2)		
S5	Assemble to Rosemount 306 Integral Manifold	★
Calibration Accuracy(8)		
P8	0.065% accuracy to 10:1 turndown	★
Water Approval(9)		
DW	NSF drinking water approval	★
Surface Finish		
Q16	Surface finish certification for sanitary remote seals	★
Toolkit Total System Performance Reports		
QZ	Remote seal system performance calculation report	★
HART Revision Configuration(6)		
HR 5(10)	Configured for HART Revision 5	★
HR7(11)	Configured for HART Revision 7	★
Typical Model Number: 2088 G 2 S 22 A 1 B4 M5		

(1) Use 1/2–14 NPT female process connection code A.
(2) "Assemble-to" items are specified separately and require a completed model number.
(3) Not available with Low Power transmitter output code N.
(4) Only available with conduit thread code 4.
(5) Only available with 4–20 mA HART output (output code A).
(6) Select configuration buttons (option code D4 or DZ) or local operator interface (option code M4) if local configuration buttons are required.
(7) Transmitter shipped with 316SST conduit plug (uninstalled) in place of standard carbon steel conduit plug.
(8) Requires transmitter output code S with either materials of construction code 22 or 23.
(9) Requires materials of construction code 22 with process connection code A.
(10) Configures the HART output to HART Revision 5. The device can be field configured to HART Revision 7 if needed.
(11) 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 = ±% of span

Ambient temperature effect

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

Total effect includes zero an d 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

Warranty

Warranty details can be found in Emerson Terms & Conditions of Sale, document 63445, Rev G (10/6).

For all Rosemount 2088 models:

- One-year limited warranty is standard.
- Extended three-year and five-year limited warranties available if ordered (select option WR3 or WR5 in model string respectively).

Note
Goods are warranted for 12 months from the date of initial installation or 18 months from the date of shipment by seller, whichever period expires first.

Note
Three-year and five-year warranty period begins on date of shipment by seller.

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

Electromagnetic compatibility (EMC)

Meets all industrial environment requirements of EN61326 and NAMUR NE-21. Maximum deviation <1% Span during EMC disturbance.

Note
NAMUR NE-21 does not apply to Low-Power (Transmitter output option code N).

Note
During surge event, device may exceed maximum EMC deviation limit or reset; however, device will self-recover and return to normal operation within specified start-up time.

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 × 20 microseconds)

6 kV crest (1.2 × 50 microseconds)

General specifications

Tested to IEC 801-3

Functional specifications

Table 3: Rosemount 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

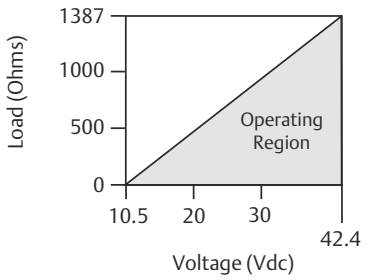
Power Supply

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



Maximum loop resistance = 43.5 (Power supply voltage – 10.5)

The Field Communicator requires a minimum loop resistance of 250 Ω for communication.

Indication

Optional two-line LOI/LCD display

Zero and Span Adjustment Requirements

Zero and span values can be set anywhere within the range limits stated in Table 3. Span must be greater than or equal to the minimum span stated in Table 3.

LOI

The LOI utilizes a two-button menu with internal and external configuration buttons. Internal buttons are always configured for LOI. 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: 22 times per second minimum

Temperature limits

Ambient

–40 to 185 °F (–40 to 85 °C)

With LCD display: –40 to 176 °F (–40 to 80 °C)

Note
For the output code N, LCD display may not be readable and LCD display updates will be slower at temperatures below –22 °F (–30 °C).

Storage

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

–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)

Inert fill sensor: –22 to 250 °F (–30 to 121 °C)

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

Note
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) × 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:

Table 4: 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

Table 5: 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

Physical specifications

Material selection

Emerson provides a variety of Rosemount product with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options and components for the particular application. Emerson is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.

Electrical Connections

1/2–14 NPT, M20 3 1.5 (CM20), or G 1/2 female (PF 1/2 female) conduit entry

Note
Consists of a 1/2-14NPT housing with a G 1/2 adapter.

Process Connections

1/2–14 NPT female, DIN 16288 G 1/2 male, RC 1/2 female (PT 1/2 female), M20 3 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

Enclosures meet NEMA® Type 4X, IP66, and IP68 when properly installed

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

Rev 1.11

European Directive Information

A copy of the EU Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EU Declaration of Conformity can be found at Emerson.com/Rosemount.

Ordinary Location Certification

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

North America

E5 USA Explosionproof (XP) and Dust-Ignitionproof (DIP)

Certificate: 1V2A8.AE

Standards: FM Class 3600 – 2011, FM, Class 3615 – 2006, FM Class 3616 – 2011, FM Class 3810 – 2005, ANSI/NEMA 250 – 1991

Markings: XP CL I, DIV 1, GP B, C, D; DIP CL II, DIV 1, GP E, F, G; CL III; T5(–40 °C ≤ T_a ≤ +85 °C); Factory Sealed; Type 4X

I5 USA Safety (IS) and Nonincendive (NI)

Certificate: 0V9A7.AX

Standards: FM Class 3600 – 1998, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 1989

Markings: IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; Class III; DIV 1 when connected per Rosemount drawing 02088-1018; NI CL 1, DIV 2, GP A, B, C, D; T4(–40 °C ≤ T_a ≤ +70 °C); Type 4x

Special Condition for Safe Use (X):

1. The Rosemount 2088 Transmitter with the transient terminal block (Option code T1) will not pass the 500 Vrms dielectric strength test and this must be taken into account during installation.

C6 Canada Explosionproof, Intrinsic Safety and Division 2, Dust-Ignitionproof

Certificate: 1015441

Standards: CAN/CSA C22.2 No. 0-M91 (R2001), CSA Std C22.2 No. 25-1966, CSA Std C22.2 No. 30-M1986, CAN/CSA-C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987, CAN/CSA-C22.2 No. 157-92, CSA Std C22.2 No. 213-M1987, ANSI-ISA-12.27.01-2003

Markings: Explosionproof for Class I, Division 1, Groups B,C and D; Dust-Ignitionproof Class II, Division 1, Groups E, F, G; Class III Division 1; Intrinsically Safe Class I, Division 1 Groups A, B, C, D when connected in accordance with Rosemount drawing 02088-1024, Temperature Code T3C; Class I Division 2 Groups A, B, C and D; Type 4X; Factory Sealed; Single Seal

Europe

ED ATEX Flameproof

Certificate: KEMA97ATEX2378X

Standards: EN60079-0:2012 + A11:2013, EN60079-1:2014, EN60079-26:2015

Markings: Ⓔx II 1/2 G Ex db IIC T6....T4, Ga/Gb, T6(–60 °C ≤ T_a ≤ +70 °C), T4/T5(–60 °C ≤ T_a ≤ +80 °C)

Special Conditions for Safe Use (X):

1. 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.
2. Flameproof joints are not intended for repair.
3. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces, and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

I1 ATEX Intrinsic Safety

Certificate: BAS00ATEX1166X

Standards: EN60079-0:2012 + A11:2013, EN60079-11:2012

Markings: Ⓔx II 1 G Ex ia IIC T4 Ga (–55 °C ≤ T_a ≤ +70 °C)

Table 6: Input Parameters

Parameter	HART
Voltage U_i	30 V
Current I_i	200 mA
Power P_i	0.9 W
Capacitance C_i	0.012 µF

Special Condition for Safe Use (X):

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

N1 ATEX Type n

Certificate: BAS00ATEX3167X

Standards: EN60079-0:2012 + A11:2013, EN60079-15:2010

Markings: Ⓔx II 3 G Ex nA IIC T5 Gc (–40 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V insulation test required by EN60079-15. This must be taken into account when installing the apparatus.

ND ATEX Dust

Certificate: BAS01ATEX1427X

Standards: EN60079-0:2012 + A11:2013, EN60079-31:2009

Markings: II 1 D **Ex t IIIC T50 °C T $_{500}$ 60** °C **Da**

Special Conditions for Safe Use (X):

1. The user must ensure the maximum rated voltage and current (36 volts, 24 milliamps, d.c.) are not exceeded. All connection to other apparatus or associated apparatus shall have control over this voltage and current to a category 'ib' circuit.
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 7 J impact test.
5. The Rosemount 2088/2090 sensor module must be securely screwed in place to maintain the ingress protection of the enclosure.

International

E7 IECEx Flameproof

Certificate: IECEx KEM 06.0021X

Standards: IEC 60079-0:2011, IEC60079-1:2014, IEC60079-26:2014

Markings: Ex d IIC T6...T4 Ga/Gb, T6(–60 °C ≤ T_a ≤ +70 °C), T4/T5 (–60 °C ≤ T_a ≤ +80 °C)

Special Conditions for Safe Use (x):

1. 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.
2. Flameproof joints are not intended for repair.
3. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces, and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

I7 IECEx Intrinsic Safety

Certificate: IECEx BAS 12.0071X

Standards: IEC60079-0:2011, IEC60079-11:2011

Markings: Ex ia IIC T4 Ga (–55 °C ≤ T_a ≤ +70 °C)

Table 7: Entity Parameters

Parameter	HART
Voltage U_i	30 V
Current I_i	200 mA
Power P_i	0.9 W
Capacitance C_i	0.012 µF

Special Conditions for Safe Use (X):

1. When fitted with a transient suppression terminal block, the Rosemount 2088 is incapable of passing the 500 V 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.

N7 IECEx Type n

Certificate:	IECEx BAS 12.0072X
Standards:	IEC60079-0:2011, IEC60079-15:2010
Markings:	Ex nA IIC T5 Gc (–40 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

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

NK IECEx Dust

Certificate:	IECEx BAS12.0073X
Standards:	IEC60079-0:2011, IEC60079-31:2008
Markings:	Ex t IIIC T50 °C T_{500} **60** °C **Da**

Table 8: Input Parameters

Parameter	HART
Voltage U_i	36 V
Current I_i	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 7 J impact.

Brazil

E2 INMETRO Flameproof

Certificate:	UL-BR 15.0728X
Standards:	ABNT NBR IEC60079-0:2008 + Errata 1:2011, ABNT NBR IEC 60079-1:2009 + Errata 1:2011
Markings:	Ex d IIC T* Gb, *T4(–20 °C ≤ T_a ≤ +80 °C), *T6(–20 °C ≤ T_a ≤ +40 °C)

Special Conditions For Safe Use (x):

1. This device contains a thin wall diaphragm less than 1mm thickness that forms a boundary between zone 0 (process connection) and zone 1 (all other parts of the equipment). The model code and data sheet are to be consulted for details of the diaphragm material. Installations, 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. Flameproof joints are not intended for repair.
3. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces, and only clean the painted surfaces with a damp cloth. If paint Is ordered through a special option code, contact the manufacturer for more information.

I2 INMETRO Intrinsic Safety

Certificate: UL-BR 13.0246X

Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011, ABNT NBR IEC60079-11:2009

Markings: Ex ia IIC T4 Ga (–55 °C ≤ T_a ≤ +70 °C)

Table 9: Input Parameters

Parameter	HART
Voltage U_i	30 V
Current I_i	200 mA
Power P_i	0.9 W
Capacitance C_i	0.012 µF

Special Conditions for Safe Use (X):

1. When fitted with a transient suppression terminal block, the Rosemount 2088 is incapable of passing the 500 V isolation test. This must be taken into account when installing the equipment.
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 Zone 0.

China

E3 China Flameproof

Certificate: GYJ15.1505

Standards: GB3836.1-2010, GB3836.2-2010

Markings: Ex d IIC T4/T6 Gb, T6(–20 °C ≤ T_a ≤ +40 °C), T4(–20 °C ≤ T_a ≤ +80 °C)

Special Conditions For Safe Use (X):

1. The ambient temperature is as follows:

T_a	Temperature class
–20 °C ≤ T_a ≤ 80 °C	T4
–20 °C ≤ T_a ≤ 40 °C	T6

2. The earth connection facility in the enclosure should be connected reliably.
3. During installation in hazardous location, cable glands, conduits, and blanking plugs, certified by state-appointed inspection bodies with Ex d IIC type of protection, should be used.
4. During installation, use and maintenance in explosive gas atmospheres, observe the warning “Do not open when energized”.
5. During installation, there should be no mixture harm to flameproof housing.

6. End user is not permitted to change any components insides, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
7. Maintenance should be done in non-hazardous location.
8. During installation, use and maintenance of this product, observe the following standards: GB3836.13-2013, GB3836.15-2000, GB3836.16-2006, GB50257-2014.

I3 China Intrinsic Safety

Certificate:	GYJ15.1507
Standards:	GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
Markings:	Ex ia IIC T4/T5 Ga

Special Conditions for Safe Use (X):

1. 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.
2. This apparatus is not capable of withstanding the 500 V r.m.s. insulation test required by Clause 6.3.12 of GB3836.4-2010.
3. The ambient temperature is:

T_a	Temperature class
–55 °C ≤ T_a ≤ 70 °C	T4

4. Intrinsically safe parameters:

Parameter	HART
Voltage U_i	30 V
Current I_i	200 mA
Power P_i	0.9 W
Capacitance C_i	0.012 μF
Inductance L_i	0 mH

5. The product should be used with Ex-certified linear associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of the product and associated apparatus.
6. The cables between this product and associated apparatus should be shielded cables (the cables must have insulated shields). The shield has to be grounded reliably in a non-hazardous area.
7. End users are not permitted to change any internal components, but to settle the problem in conjunction with the manufacturer to avoid damage to the product.
8. During installation, use and maintenance of this product, observe the following standards: GB3836.13-2013, GB3836.15-2000, GB3836.16-2006, GB3836.18-2010, GB50257-2014.

N3 China Type n

Certificate:	GYJ15.1108X
Standards:	GB3836.1-2000, GB3836. 8-2003
Markings:	Ex nA nL IIC T5 Gc (–40 °C ≤ T_a ≤ +70 °C)

Special Conditions For Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V r.m.s. insulation test required by GB3836.8-2003.
2. The ambient temperature range is –40 °C ≤ Ta ≤ +70 °C.
3. Maximum input voltage: 50 V.
4. Cable glands, conduit or blanking plugs, certified by NEPSI with Ex e or Ex n protection types should be used on external connections and redundant cable entries.
5. Maintenance should be done in non-hazardous location.
6. End users are not permitted to change any internal components, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
7. During installation, use and maintenance of this product, observe the following standards: GB3836.13-2013, GB3836.15-2000, GB3836.16-2006, GB50257-1996.

Japan

E4 Japan Flameproof

Certificate:	TC20869, TC20870
Markings:	Ex d IIC T5

Technical Regulations Customs Union (EAC)

EM EAC Flameproof

Certificate:	RU C-US.GB05.B.01197
Markings:	Ga/Gb Ex d IIC T4/T6 X, T4(–40 °C ≤ T_a ≤ +80 °C), T6(–40 °C ≤ T_a ≤ +40 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

IM EAC Intrinsically Safe

Certificate:	RU C-US.GB05.B.01197
Markings:	0Ex ia IIC T4 Ga X (–55 °C ≤ T_a ≤ +70 °C)

Combinations

K1 Combination of ED, I1, ND and N1

K2 Combination of E2 and I2

K5 Combination of E5 and I5

K6 Combination of C6, ED and I1

K7 Combination of E7, I7, NK and N7

KB Combination of K5 and C6

KM Combination of EM and IM

KH Combination of ED, I1, K5

Conduit Plugs and Adapters

IECEx Flameproof and Increased Safety

Certificate: IECEx FMG 13.0032X

Standards: IEC60079-0:2011, IEC60079-1:2007-04, IEC60079-7:2006-07

Markings: Ex de IIC Gb

ATEX Flameproof and Increased Safety

Certificate: FM13ATEX0076X

Standards: EN60079-0:2012, EN60079-1:2007, IEC60079-7:2007

Markings: ⟨Ex⟩ II 2 G Ex de IIC Gb

Table 10: Conduit Plug Thread Sizes

Thread	Identification mark
M20 × 1.5 – 6g	M20
1/2–14 NPT	1/2 NPT
G1/2A	G1/2

Table 11: Thread Adapter Thread Sizes

Male thread	Identification mark
M20 × 1.5 – 6H	M20
1/2–14 NPT	1/2–14 NPT
3/4–14 NPT	3/4–14 NPT
Female thread	Identification mark
M20 × 1.5 – 6H	M20
1/2–14 NPT	1/2–14 NPT
G1/2	G1/2

Special Conditions For Safe Use (X):

1. When the thread adapter or blanking plug is used with an enclosure in type of protection increased safety “e” the entry thread shall be suitably sealed in order to maintain the ingress protection rating (IP) of the enclosure.
2. The blanking plug shall not be used with an adapter.
3. Blanking Plug and Threaded Adapter shall be either NPT or Metric thread forms. G1/2 thread forms are only acceptable for existing (legacy) equipment installations.

Additional Certifications

SBS American Bureau of Shipping (ABS) Type Approval

Certificate: 09-HS446883D-3-PDA

Intended Use: Measure gauge or absolute pressure of liquid, gas or vapor applications on ABS classed vessels, marine, and offshore installations.

ABS Rules: 2014 Steel Vessels Rules 1-1-4/7.7, 1-1-Appendix 3, 4-8-3/1.7, 4-8-3/13.1, 4-8-3/13.3.1 & 13.3.2, 4-8-4/27.5.1

SBV Bureau Veritas (BV) Type Approval

Certificate: 23156/B0 BV

Requirements: Bureau Veritas Rules for the Classification of Steel Ships

Application: Class notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS; Pressure transmitter type 2088 cannot be installed on diesel engines

SDN Det Norske Veritas (DNV) Type Approval

Certificate: TAA000004F

Intended Use: DNV GL Rules for Classification - Ships and offshore units

Application:

Location classes	
Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	D

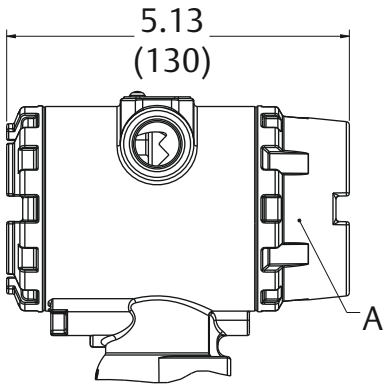
SLL Lloyds Register (LR) Type Approval

Certificate: 11/60002

Application: Environmental categories ENV1, ENV2, ENV3 and ENV5

Dimensional drawings

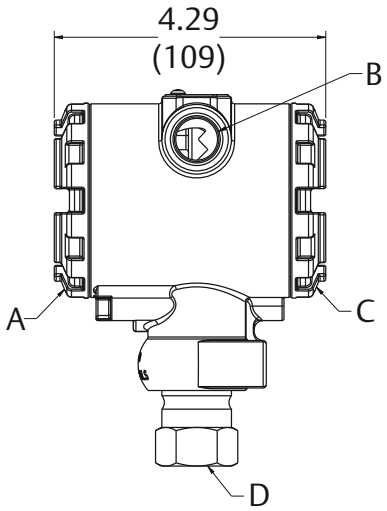
Figure 2: Rosemount 2088 with Optional Digital Display



A. Digital display cover
B. 21/2–14 NPT conduit connection

Dimensions are in inches (millimeters).

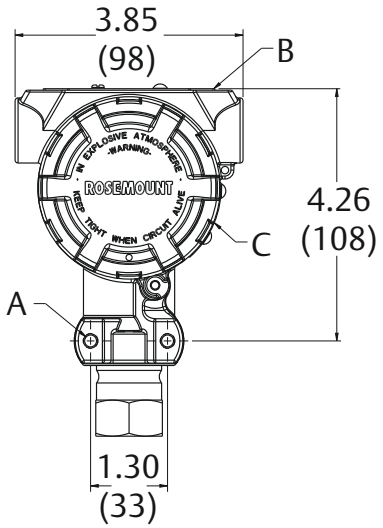
Figure 3: Rosemount 2088 Process Connection



A. Field terminals
B. Conduit connection
C. Transmitter electronics
D. 1/2–14 NPT female connection

Note
RC 1/2 female (PT 1/2 female), and M20 female also available as options.

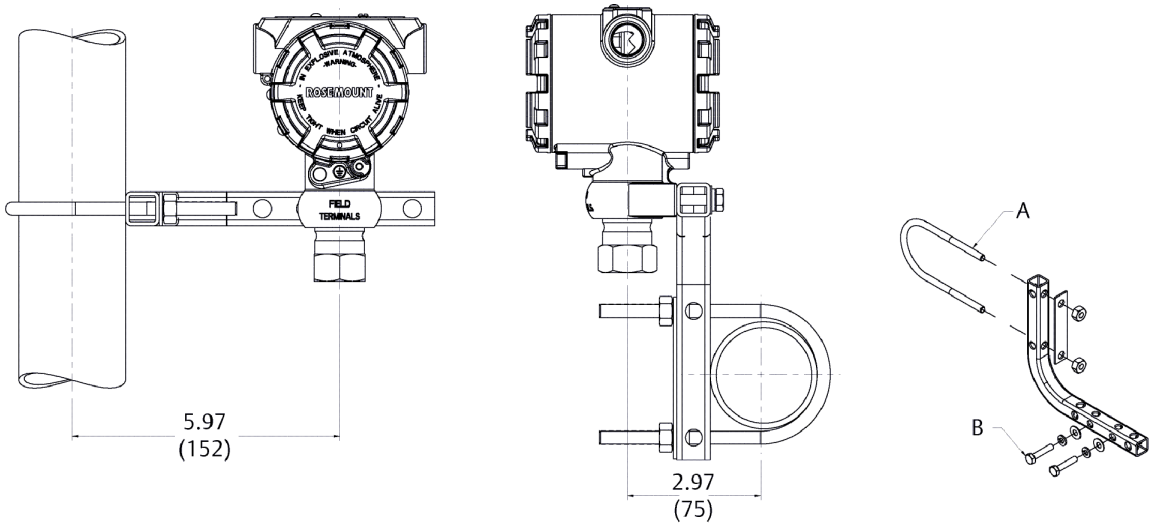
Figure 4: Rosemount 2088 Nameplate and Labels



A. Bracket mounting holes (1/4–20 UNC)
B. Nameplate
C. Certification label (located on side)

Dimensions are in inches (millimeters).

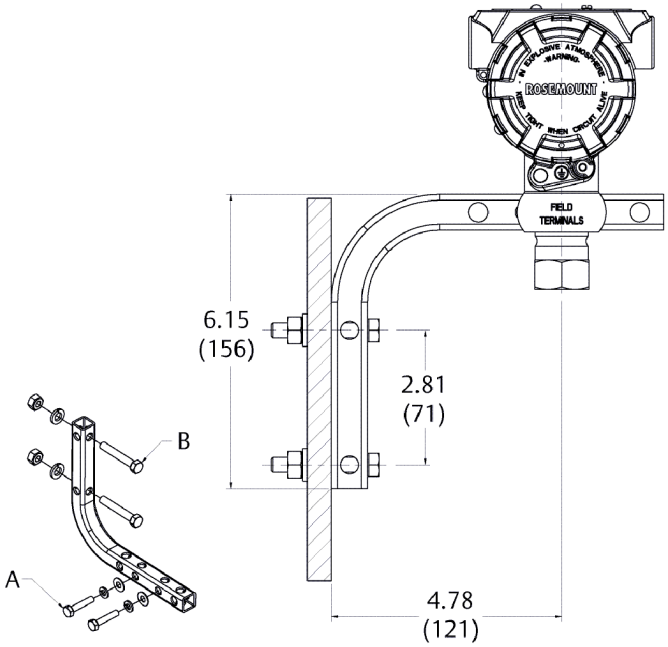
Figure 5: Rosemount 2088 with Optional Pipe Mounting Bracket



A. 2-in. U-bolt for pipe mounting (clamp shown)
B. 1/411/4 bolts for transmitter mounting

Dimensions are in inches (millimeters).

Figure 6: Rosemount 2088 with Optional Panel Mounting Bracket



A. 1/4 X 11/4 bolts for transmitter mounting
B. 5/16 X 11/2 bolts for panel mounting (not supplied)

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.

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 Rosemount 2088 Transmitters. Refer to Rosemount Manifolds Product Data Sheet for additional information.

Other Seals

Refer to Rosemount DP Level Transmitters and 1199 Diaphragm Seal System Product Data Sheet 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

- Two-line, five-digit LCD display for 4–20 mA HART
- Two-line, five-digit LCD display 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.

- Selecting option D4 will add external analog zero and span configuration buttons
- Selecting option DZ will add an external digital zero trim configuration button
- Selecting option M4 (LOI) adds both internal and external local configuration buttons

Certain button options can also be combined as shown below:

Table 12: Button Configuration

Option codes	Internal	External
DZ	N/A	Digital zero trim
D4	N/A	Analog zero and trim
M4	LOI	LOI
M4 + DZ	LOI	Digital zero trim
M4 + D4	LOI	Analog zero and 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

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