

# Rosemount™ 2088 Absolute and Gauge Pressure Transmitter



- Performance of 0.065 percent 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 gauge pressure ranges up to 4,000 psi (276 bar)
- Rangeability of 50:1

# Product offering

## Proven reliability for gauge 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 (SST) 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



The Rosemount 2088 Gage and Absolute Pressure Transmitter offers proven reliability for gage and absolute pressure measurement. The in-line, compact design allows the transmitter to be connected directly to the process for quick, easy, and cost effective installation. Capabilities include:

- Local Operator Interface (LOI) that has easy-to-use menus and built-in configuration buttons, so you can commission the device on the spot without complicated tools.
- Available with manifolds and remote seals.
- 4-20 mA HART and 1-5 Vdc HART Low Power.

CONFIGURE >

VIEW PRODUCT >

### Online product configurator

Many products are configurable online using our Product Configurator. Select the **Configure** button or visit our [website](#) to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

### Specifications and options

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

### Model codes

Model codes contain the details related to each product. Exact model codes will vary; an example of a typical model code is shown in [Figure 1](#).

**Figure 1: Model Code Example**

3051C D 2 X 2 2 M5 B4

1                      2

1. Required model components (choices available on most)
2. Additional options (variety of features and functions that may be added to products)

### Optimizing lead time

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.

## Required model components

### Model

Code	Description
2088	Pressure transmitter

### Measurement type

Code	Description	
A	Absolute	★
G	Gauge	★

### Pressure ranges

Code	Rosemount 2088G	Rosemount 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)	★

### Transmitter output

HART Revision 5 is the default HART output. The Rosemount 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.

Code	Description	
S	4–20 mA dc/Digital HART Protocol	★
N	1–5 Vdc Low Power/Digital HART Protocol	★

### Materials of construction

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.

Code	Process connection	Isolating diaphragm	Fill fluid	
22	316L SST	316L SST	Silicone	★
33	Alloy C-276	Alloy C-276	Silicone	★
2B	316L SST	316L SST	Inert	

### Process connection

Code	Description	
A	½–14 NPT female	★

Code	Description	
B <sup>(1)</sup>	DIN 16288 G½ male	★
D <sup>(1)(2)</sup>	M20 x 1.5 male	★
C <sup>(2)(3)</sup>	RC ½ female	

- (1) Not available with Low Power transmitter output code N.  
 (2) Not available with Alloy C-276, materials of construction code 33.  
 (3) Consists of a ½–14 NPT housing with a G½ adapter.

## Conduit entry

Code	Description	
1	½–14 NPT	★
2 <sup>(1)</sup>	M20 x 1.5	★
4 <sup>(1)(2)</sup>	G½	

- (1) Not available with Low Power transmitter output code N.  
 (2) Consists of a ½–14 NPT housing with a G½ adapter.

## Additional options

### Extended product warranty

Code	Description	
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★

### Diaphragm seal assemblies

Use ½–14 NPT female process connection code A. “Assemble-to” items are specified separately and require a completed model number.

Code	Description	
S1	Assemble to one Rosemount 1199 Diaphragm Seal	★

### Display and interface

Code	Description	
M4	LCD display with local operator interface	★
M5	LCD display, configured for engineering units	★

### Configuration buttons

Code	Description	
D4	Analog zero and span	★

Code	Description	
DZ	Digital zero trim	★

## Mounting brackets

Code	Description	
B4	SST mounting bracket with SST bolts	★

## Product certifications

Code	Description	
C6	Canada Explosionproof, Intrinsic Safety, Division 2, and Dust-Ignitionproof	★
E2	INMETRO Flameproof	★
E4 <sup>(1)(2)</sup>	Japan Flameproof	★
E5	USA Explosionproof (XP) and Dust-Ignitionproof (DIP)	★
E7	IECEX Flameproof	★
ED	ATEX Flameproof	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
I1 <sup>(1)</sup>	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 <sup>(1)</sup>	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 <sup>(1)</sup>	ATEX Flameproof, Intrinsic Safety, and USA Explosion-Proof, Dust Ignitionproof, Intrinsic Safety, and Nonincendive	★
N1 <sup>(1)</sup>	ATEX Type n	★
N3	China Type n	★
N7	IECEX Type n	★
ND <sup>(1)</sup>	ATEX Dust	★

Code	Description	
NK	IECEX Dust	★

(1) Not available with Low Power transmitter output code N.

(2) Only available with conduit thread code 1.

## Shipboard approvals

Code	Description	
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

Code	Description	
P1	Hydrostatic testing	

## Terminal blocks

Code	Description	
T1	Transient protection	★

## Special cleaning

Code	Description	
P2	Cleaning for special service	

## Calibration certificate

Code	Description	
Q4	Calibration certificate	★

## Quality calibration certificate traceability certification

Code	Description	
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	★



### Positive material identification (PMI)

Code	Description	
Q76	PMI verification and certificate	★

### Digital signal

Code	Description	
C4 <sup>(1)</sup>	NAMUR alarm and saturation levels, high alarm	★
CN <sup>(1)</sup>	NAMUR alarm and saturation levels, low alarm	★
C5 <sup>(1)(2)</sup>	Custom alarm and saturation levels, high alarm (requires C9 and Configuration Data Sheet)	★
C7 <sup>(1)(2)</sup>	Custom alarm and saturation levels, low alarm (requires C9 and Configuration Data Sheet)	★
C8 <sup>(2)</sup>	Low alarm (Standard Rosemount alarm and saturation levels)	★

(1) Only available with 4–20 mA HART output (output code A).

(2) Select configuration buttons (option code D4 or DZ) or local operator interface (option code M4) if local configuration buttons are required.

### Conduit plug

Transmitter shipped with 316SST conduit plug (uninstalled) in place of standard carbon steel conduit plug.

Code	Description	
DO	316 SST conduit plug	★

### Configuration

Code	Description	
C9	Software configuration	★

### Manifold assemblies

Use ½–14 NPT female process connection code A. “Assemble-to” items are specified separately and require a completed model number.

Code	Description	
S5	Assemble to Rosemount 306 Integral Manifold	★

### Calibration accuracy

Requires transmitter output code S with either materials of construction code 22 or 23.

Code	Description	
P8	0.065% accuracy to 10:1 turndown	★

## Water approval

Requires materials of construction code 22 with process connection code A.

Code	Description	
DW	NSF drinking water approval	★

## Surface finish

Code	Description	
Q16	Surface finish certification for sanitary remote seals	★

## Toolkit total system performance reports

Code	Description	
QZ	Remote seal system performance calculation report	★

## HART revision configuration

Select configuration buttons (option code D4 or DZ) or local operator interface (option code M4) if local configuration buttons are required.

Code	Description	
HR5 <sup>(1)</sup>	Configured for HART Revision 5	★
HR7 <sup>(2)</sup>	Configured for HART Revision 7	★

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

(2) 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, and 316L SST isolating diaphragm

### Reference accuracy

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

±0.065 percent of calibrated span (high accuracy option – P8)

For spans less than 10:1, accuracy =  $\pm \left[ 0.009 \left( \frac{URL}{Span} \right) \right]$  percent of span

### Ambient temperature effect

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

Total effect includes zero and span effects

± (0.15 percent URL + 0.15 percent of span)

### Stability

Ranges 2–4: ±0.10 percent of URL for three years

Range 1: ±0.10 percent of URL for one year

### Warranty

Warranty details can be found in [Emerson Terms & Conditions of Sale](#).

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).

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#### 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.

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#### Note

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

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### Vibration effect

Less than ±0.1 percent 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 percent of calibrated span per volt change in voltage at the transmitter terminals.

### Electromagnetic compatibility

Meets all industrial environment requirements of EN61326 and NAMUR NE-21. Maximum deviation <1 percent 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<sub>2</sub>O (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 1: Rosemount 2088 Range Values**

Range	Minimum span	Upper (URL)	Lower (LRL)	Lower <sup>(1)</sup> (LRL) (gauge)
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

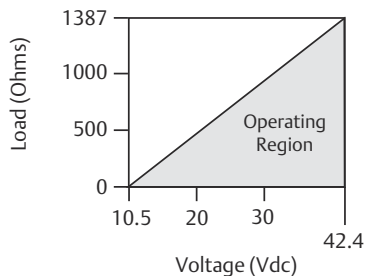
## Power supply

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 2: Maximum Loop Resistance**



Maximum loop resistance =  $43.5 \text{ (Power supply voltage - 10.5)}$

The Field Communicator requires a minimum loop resistance of  $250 \Omega$  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 1](#). Span must be greater than or equal to the minimum span stated in [Table 1](#).

## 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:  $\leq 3 \text{ mA}$

## 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 zero 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)

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### 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).

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### Storage

-50 to 230 °F (-46 to 110 °C)

With LCD display: -40 to 185 °F (-40 to 85 °C)

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### Note

If storage temperature is above 185 °F (85 °C), perform a sensor trim prior to installation.

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### Process

Silicone fill sensor: -40 to 250 °F (-40 to 121 °C)

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

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### Note

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

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### 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:  $(195\text{ °F} - 185\text{ °F}) \times 1.5 = 15\text{ °F}$ ,  $185\text{ °F} - 15\text{ °F} = 170\text{ °F}$

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## Humidity limits

0–100 percent relative humidity

## Volumetric displacement

Less than 0.0005 in<sup>3</sup> (0.008 cm<sup>3</sup>)

## 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 2: Standard Operation**

Output code	Linear output	Fail high	Fail low
S	$3.9 \leq I \leq 20.8$	$I \geq 21.75 \text{ mA}$	$I \leq 3.75 \text{ mA}$
N	$0.97 \leq V \leq 5.2$	$V \geq 5.4 \text{ V}$	$V \leq 0.95 \text{ V}$

**Table 3: NAMUR-Compliant Operation**

Output code	Linear output	Fail high	Fail low
S	$3.8 \leq I \leq 20.5$	$I \geq 22.5 \text{ mA}$	$I \leq 3.6 \text{ mA}$

## 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

½–14 NPT, M20 x 1.5 (CM20), or G½ female (PF ½ female) conduit entry

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### Note

Consists of a ½-14NPT housing with a G½ adapter.

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## Process connections

½–14 NPT female, DIN 16288 G½ male, RC ½ female (PT ½ female), M20 x 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 1.18

## 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](http://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( $-40\text{ °C} \leq T_a \leq +85\text{ °C}$ ); Factory Sealed; Type 4X

### I5 USA Safety (IS) and Nonincendive (NI)

**Certificate** 1015441

**Standards** FM Class 3600 – 2011, FM Class 3610 – 2010, FM Class 3611 – 2004, FM Class 3810 – 2005

**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 02088–1024; NI CL 1, DIV 2, GP A, B, C, D; T4( $-50\text{ °C} \leq T_a \leq +70\text{ °C}$ ); Type 4x

### 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; Class II, Groups E, F, and G; Class III; Intrinsically Safe Class I, Division 1 when connected in accordance with Rosemount drawing 02088–1024, Temperature Code T3C; Ex ia; 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** Ⓔ II ½ G Ex db IIC T6....T4, Ga/Gb, T6(-60 °C ≤ T<sub>a</sub> ≤ +70 °C), T4/T5(-60 °C ≤ T<sub>a</sub> ≤ +80 °C)

**Table 4: Process Connection Temperature**

Temperature class	Process connection temperature	Ambient temperature
T6	-60 to +70 °C	-60 to +70 °C
T5	-60 to +80 °C	-60 to +80 °C
T4	-60 to +120 °C	-60 to +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** Ⓔ II 1 G Ex ia IIC T4 Ga (-55 °C ≤ T<sub>a</sub> ≤ +70 °C)

**Table 5: Input Parameters**

Parameter	HART
Voltage U <sub>i</sub>	30 V
Current I <sub>i</sub>	200 mA
Power P <sub>i</sub>	0.9 W
Capacitance C <sub>i</sub>	0.012 μF

### Special Conditions 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.
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.

### N1 ATEX Type n

- Certificate** BAS00ATEX3167X
- Standards** EN60079-0:2012 + A11:2013, EN60079-15:2010
- Markings** Ⓔ II 3 G Ex nA IIC T5 Gc (-40 °C ≤ T<sub>a</sub> ≤ +70 °C)

**Special Condition for Safe Use (X):**

1. When fitted with a transient suppression terminal block, the equipment is not capable of withstanding the 500V insulation test that is required by EN60079–15. This must be taken into account when installing the apparatus.

**ND ATEX Dust**

<b>Certificate</b>	BAS01ATEX1427X
<b>Standards</b>	EN60079–0:2012 + A11:2013, EN60079–31:2009
<b>Markings</b>	Ⓔ II 1 D Ex t IIIC T50 °C T <sub>500</sub> 60 °C Da

**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 test.

## International

**E7 IECEx Flameproof**

<b>Certificate</b>	IECEX KEM 06.0021X
<b>Standards</b>	IEC 60079–0:2011, IEC60079–1:2014, IEC60079–26:2014
<b>Markings</b>	Ex d IIC T6...T4 Ga/Gb, T6(–60 °C ≤ T <sub>a</sub> ≤ +70 °C), T4/T5 (–60 °C ≤ T <sub>a</sub> ≤ +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**

<b>Certificate</b>	IECEX BAS 12.0071X
<b>Standards</b>	IEC60079–0:2011, IEC60079–11:2011
<b>Markings</b>	Ex ia IIC T4 Ga (–55 °C ≤ T <sub>a</sub> ≤ +70 °C)

**Table 6: Input Parameters**

Parameter	HART
Voltage U <sub>i</sub>	30 V
Current I <sub>i</sub>	200 mA
Power P <sub>i</sub>	0.9 W
Capacitance C <sub>i</sub>	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**

<b>Certificate</b>	IECEx BAS 12.0072X
<b>Standards</b>	IEC60079-0:2011, IEC60079-15:2010
<b>Markings</b>	Ex nA IIC T5 Gc (-40 °C ≤ T <sub>a</sub> ≤ +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**

<b>Certificate</b>	IECEx BAS12.0073X
<b>Standards</b>	IEC60079-0:2011, IEC60079-31:2008
<b>Markings</b>	Ex t IIIC T50 °C T <sub>500</sub> 60 °C Da

**Table 7: Input Parameter**

Parameter	HART
Voltage U <sub>i</sub>	36 V

**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**

<b>Certificate</b>	UL-BR 15.0728X
<b>Standards</b>	ABNT NBR IEC60079-0:2013, ABNT NBR IEC 60079-1:2016, ABNT NBR IEC 60079-26:2016
<b>Markings</b>	Ex db IIC T6...T4 Ga/Gb, T4/T5(-60 °C ≤ T <sub>a</sub> ≤ +80 °C), T6(-60 °C ≤ T <sub>a</sub> ≤ +70 °C)

**Table 8: Process Connection Temperature**

Temperature class	Process connection temperature	Ambient temperature
T6	-60 to +70 °C	-60 to +70 °C
T5	-60 to +80 °C	-60 to +80 °C
T4	-60 to +120 °C	-60 to +80 °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<sub>a</sub> ≤ +70 °C)

**Table 9: Input Parameters**

Parameter	HART
Voltage U <sub>i</sub>	30 V
Current I <sub>i</sub>	200 mA
Power P <sub>i</sub>	0.9 W
Capacitance C <sub>i</sub>	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<sub>a</sub> ≤ +40 °C), T4(-20 °C ≤ T<sub>a</sub> ≤ +80 °C)

**Special Conditions For Safe Use (X):**

1. The ambient temperature is as follows:

T <sub>a</sub>	Temperature class
-20 °C ≤ T <sub>a</sub> ≤ 80 °C	T4
-20 °C ≤ T <sub>a</sub> ≤ 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

<b>Certificate</b>	GYJ15.1507
<b>Standards</b>	GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
<b>Markings</b>	Ex ia IIC T4 Ga

#### Special Conditions for Safe Use (X):

1. The enclosure may contain light metal, attention should be taken to avoid ignition hazard due to impact or friction when used in Zone 0.
2. When transient protection board is chosen (Option Code T1), this apparatus is not capable of withstanding the 500V r.m.s insulation test required by Clause 6.3.12 of GB3836.4-2010.

### N3 China Type n

<b>Certificate</b>	GYJ15.1108X
<b>Standards</b>	GB3836.1-2010, GB3836.8-2003
<b>Markings</b>	Ex nA IIC T5 Gc (-40 °C ≤ T <sub>a</sub> ≤ +70 °C)

#### Special Condition For Safe Use (X):

1. When transient protection board is chosen (Option Code T1), this apparatus is not capable of withstanding the 500V r.m.s insulation test required by Clause 6.3.12 of GB3836.4-2010.

## Korea

### EP Korea Flameproof

<b>Certificate</b>	13-KB4BO-0020X, 10-KB4BO-0137X, 19-KA4BO-0989X
<b>Markings</b>	Ex d IIC T6...T4 Ga/Gb, T4/T5(-60 °C ≤ T <sub>a</sub> ≤ +80 °C), T6(-60 °C ≤ T <sub>a</sub> ≤ +70 °C)

#### Special Condition For Safe Use (X):

1. See certificate.

## Japan

### E4 Japan Flameproof

<b>Certificate</b>	TC20869, TC20870
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**Markings**

Ex d IIC T5

## Technical Regulations Customs Union (EAC)

**EM EAC Flameproof****Certificate** EAEC RU C–US.EX01.B.00176**Markings** Ga/Gb Ex d IIC T4/T6 X, T4(–40 °C ≤ T<sub>a</sub> ≤ +80 °C), T6(–40 °C ≤ T<sub>a</sub> ≤ +40 °C)**Special Condition for Safe Use (X):**

1. See certificate.

**IM EAC Intrinsically Safe****Certificate:** EAEC RU C–US.EX01.B.00176**Markings:** 0Ex ia IIC T4 Ga X (–55 °C ≤ T<sub>a</sub> ≤ +70 °C)**Special Condition for Safe Use (X):**

1. See certificate.

## Combinations

<b>K1</b>	Combination of ED, I1, ND, and N1
<b>K2</b>	Combination of E2 and I2
<b>K5</b>	Combination of E5 and I5
<b>K6</b>	Combination of C6, ED, and I1
<b>K7</b>	Combination of E7, I7, NK, and N7
<b>KB</b>	Combination of K5 and C6
<b>KM</b>	Combination of EM and IM
<b>KH</b>	Combination of ED, I1, and 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**  II 2 G Ex de IIC Gb

**Table 10: Conduit Plug Thread Sizes**

Thread	Identification mark
M20 × 1.5 – 6g	M20
½–14 NPT	½ NPT
G½A	G½

**Table 11: Thread Adapter Thread Sizes**

Male thread	Identification mark
M20 × 1.5 – 6H	M20
½–14 NPT	½–14 NPT
¾–14 NPT	¾–14 NPT
Female thread	Identification mark
M20 × 1.5 – 6H	M20
½–14 NPT	½–14 NPT
G½	G½

**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. G½ thread forms are only acceptable for existing (legacy) equipment installations.

## Additional Certifications

**SBS American Bureau of Shipping (ABS) Type Approval**

**Certificate** 18-HS1814314-PDA

**Intended Use** Measurement of either gauge or absolute pressure for liquid, gas, and vapor.

**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

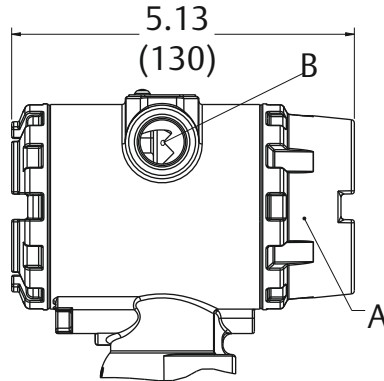
**SLL Lloyds Register (LR) Type Approval**

**Certificate** 11/60002

**Application** Environmental categories ENV1, ENV2, ENV3, and ENV5

# Dimensional drawings

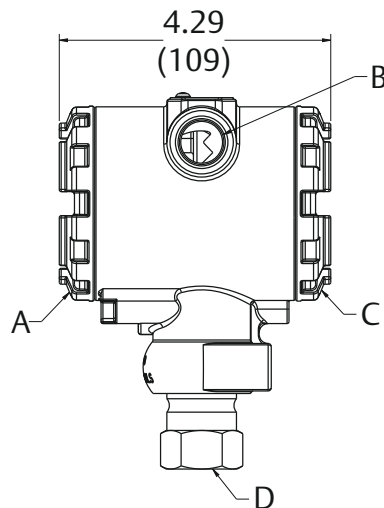
**Figure 3: Optional Digital Display**



- A. Digital display cover
- B. 2½–14 NPT conduit connection

Dimensions are in inches (millimeters).

**Figure 4: Process Connection**

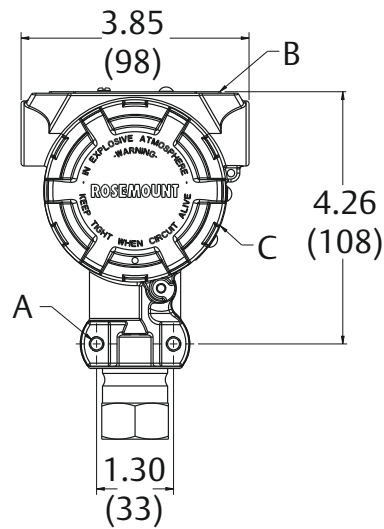


- A. Field terminals
- B. Conduit connection
- C. Transmitter electronics
- D. ½–14 NPT female connection

**Note**

RC ½ female (PT ½ female), and M20 female also available as options.

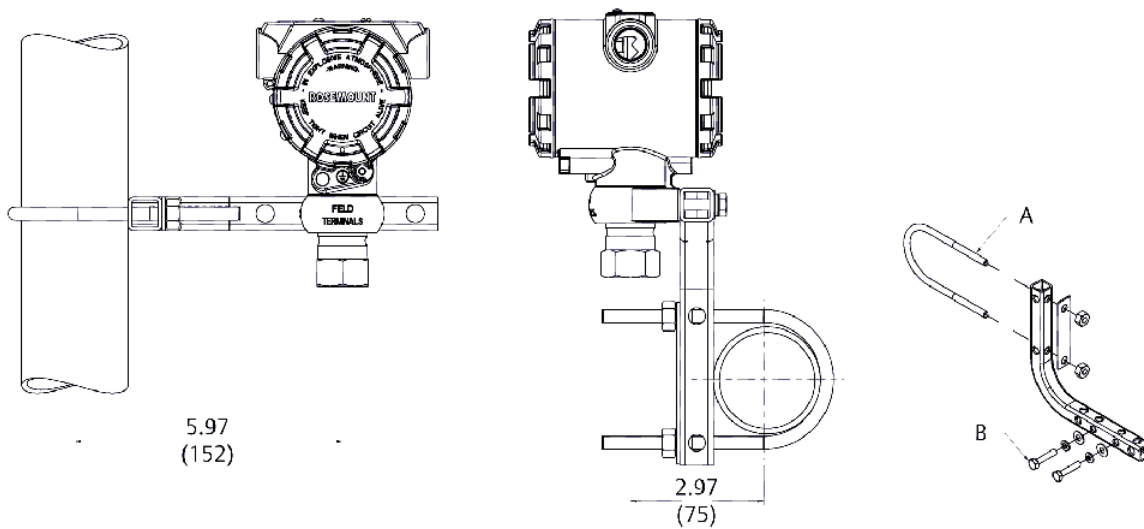
**Figure 5: Nameplate and Labels**



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

Dimensions are in inches (millimeters).

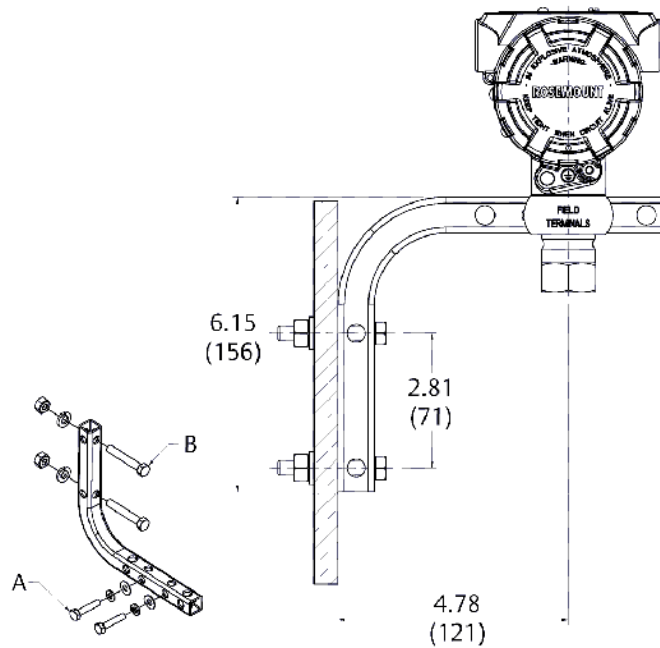
**Figure 6: Optional Pipe Mounting Bracket**



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

Dimensions are in inches (millimeters).

Figure 7: Optional Panel Mounting Bracket



- A. 1/4 X 1 1/4 bolts for transmitter mounting
- B. 5/16 X 1 1/2 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 (three 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: eight 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:

**Table 12: Pressure Units**

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

torr	psf	cmH <sub>2</sub> O at 4 °C
atm	inH <sub>2</sub> O	mH <sub>2</sub> O at 4 °C
Pa	inH <sub>2</sub> O at 4 °C	inHg
kPa	inH <sub>2</sub> O at 60 °F	mmHg
MPa	ftH <sub>2</sub> O	cmHg at 0 °C
hPa	ftH <sub>2</sub> O at 4 °C	mHg at 0 °C

**Table 12: Pressure Units (continued)**

mbar	ftH <sub>2</sub> O at 60 °F	g/cm <sup>2</sup>
bar	mmH <sub>2</sub> O	kg/m <sup>2</sup>
psi	mmH <sub>2</sub> O at 4 °C	kg/cm <sup>2</sup>

## 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 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 13: 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



For more information: [www.emerson.com](http://www.emerson.com)

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