

Rosemount™ 3051S High Static DP Transmitter



Innovation reaching across your operation

With Rosemount 3051S High Pressure Solutions, you can optimize your operation in critical areas such as production, quality, energy efficiency, and safety and environment. By leveraging the power of the scalable Rosemount 3051S across your entire operation, you'll be able to minimize process variability, gain greater process insight, reduce maintenance and downtime, and meet regulatory demands. What's more, it's easy for your people to use, ensuring you will realize the full potential of your measurement investment.

3051S Series of Instrumentation

Rosemount 3051S SuperModule™ Platform

The most advanced pressure, flow, and level measurements



- The all-welded hermetic design delivers the industry's highest field reliability
- Patented electronics within the SuperModule
- SIL 3 Capable: IEC61508 certified by an accredited third party agency for use in safety instrumented systems up to SIL 3 (minimum requirement of single use [1oo1] for SIL2 and redundant use [1oo2] for SIL 3)

Rosemount 3051S High Pressure Solutions

Rosemount 3051S High Static Differential Pressure Transmitter



- Coned and threaded direct connection enables operation in applications with static pressures up to 15,000 psi (1.034 bar)
- Coplanar platform enables integrated seal system solutions
- Calibrated Differential Pressure spans from 5 inH₂O to 150 psi (12.4 mbar to 10.4 bar)
- Dual-capacitance Saturn™ sensor technology corrects for overpressure and line pressure effects
- Available with Alloy C-276 process isolators

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Advanced functionality

WirelessHART® (IEC 62591) Capabilities

Available on Coplanar, In-Line, and Level Transmitters

- Quickly deploy new pressure, level, and flow measurements in 70 percent less time
- Eliminate wiring design and construction complexities to lower costs by 40 to 60 percent
- Extended range antenna capabilities provide access to remote locations
- Delivering over a decade of maintenance free performance with 15-year stability and 10-year power module life



Advanced diagnostic capabilities

- Provides diagnostic coverage from the process to the transmitter to the host
- Prevent on-scale failures by diagnosing electrical loop issues with Power Advisory diagnostics
- Statistical Process Monitoring detects abnormal process conditions enabling more productive and safer operations
- Extend diagnostic coverage to Safety Instrumented Systems with IEC 61508 SIL 2/3 capable rating



Additional functionality

- Remote display and interface allows for direct mounting to process to eliminate impulse lines and enables access to the transmitter's interface from 100 feet away
- Optional differential pressure + temperature measurement option available on the 3051SHP reduces overall installation cost with a 2-in-1 DP and process temperature measurement



Ordering information



3051S High Static Differential Pressure Transmitter

Rosemount 3051S High Static Differential Pressure Transmitters bring reliability based on the industry leading 3051S SuperModule design to installations with high static pressure conditions. The lightweight coplanar design results in a more accurate measurement while reducing transmitter weight over traditional high static pressure transmitters. Capabilities include:

- Accurate and reliable measurements up to static lines pressure of 15,000 psi (1.034 bar)
- 4-20 mA HART®, WirelessHART®, FOUNDATION Fieldbus protocols
- Safety Certification (Options Code QT)
- Advanced Diagnostics (Option Code DA2)
- Differential Pressure and Temperature (Measurement Type Option Code 7)

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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 on material selection.

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

<u>3051C D 2 X 2 2 1 A</u>	<u>WA3 WP5</u>	<u>M5 B4</u>
1	2	3

1. Required model components (choices available on most)
2. Wireless options (optional for many products, required for wireless products)
3. Additional options (variety of features and functions that may be added to products)

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	
3051SHP	High Static Differential Pressure Transmitter	★

Performance class

See Specifications section for further detail.

Code	Description	
1	Ultra: 0.055 percent span accuracy, 15-yr limited warranty	★
2	Classic: 0.055 percent span accuracy	★

Connection type

Code	Description	
C	Coplanar	★

Measurement type

Code	Description	
D	Differential pressure	★
7	Differential pressure and temperature	★

Differential pressure range

Code	Description	
6	-250 to 250 inH ₂ O (-623 to 623 mbar)	★
7	-700 to 700 inH ₂ O (-1,74 to 1,74 bar)	★
8	-150 to 150 psi (-10,34 to 10,34 bar)	★

Static pressure range

Code	Description	
A	None	★

Maximum static line pressure

Code	Description	
3	15,000 psi (1.034 bar)	★

Temperature input

Code	Description	
N	None	★
R	RTD input (Type Pt 100, -328 to 1562 °F [-200 to 850 °C])	

Isolating diaphragm

Isolator diaphragm selection will dictate materials of construction for wetted parts.

Materials of Construction comply with metallurgical requirements highlighted within 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. Order with Q15 or Q25 to receive a NACE certificate.

Code	Description	
3	Alloy C-276	★

Process connection

Code	Description	
H11	Coned and threaded, compatible with autoclave type F-250-C	★

Transmitter output

Code	Description	
A	4–20 mA with digital signal based on HART® protocol	★
F ⁽¹⁾	FOUNDATION Fieldbus protocol	★
X ⁽²⁾	Wireless (requires wireless options and wireless Plantweb™ housing)	★

(1) Requires Plantweb housing.

(2) Only intrinsically safe approval codes apply.

Housing style

Code	Description	Material	Conduit entry size	
1A	Plantweb™ housing	Aluminum	½-14 NPT	★
1B		Aluminum	M20 x 1.5	★
1C		Aluminum	G½	
1J		SST	½-14 NPT	★
1K		SST	M20 x 1.5	★
1L		SST	G½	
2A	Junction box housing	Aluminum	½-14 NPT	★
2B		Aluminum	M20 x 1.5	★
2C		Aluminum	G½	
2E	Junction box housing with output for remote display and interface	Aluminum	½-14 NPT	★
2F		Aluminum	M20 x 1.5	★

Code	Description	Material	Conduit entry size	
2G		Aluminum	G½	
2J	Junction box housing	SST	½-14 NPT	★
2M	Junction box housing with output for remote display and interface	SST	½-14 NPT	★
5A ⁽¹⁾	Wireless Plantweb housing	Aluminum	½-14 NPT	★
5J ⁽¹⁾		SST	½-14 NPT	★
7J ⁽¹⁾	Quick Connect (A size Mini, 4-pin male termination)	SST	N/A	★

(1) Long-life power module must be shipped separately; order power module 701PBKKF.

Wireless options

Requires wireless output code X and engineered polymer housing code P.

Update rate

Code	Description	
WA	User-configurable update rate	★

Operating frequency and protocol

Code	Description	
3	2.4 GHz DSSS, IEC 62591 (<i>WirelessHART®</i>)	★

Omni-directional wireless antenna

Code	Description	
WK	External antenna	★
WJ	Remote antenna	
WM	Extended range, external antenna	★
WN	High-gain, remote antenna	

SmartPower™

Long-life power module must be shipped separately; order power module 701PBKKF.

Code	Description	
1	Adapter for Black Power Module (I.S. power module sold separately)	★

Additional options

Extended product warranty

Code	Description	
WR3	Three-year limited warranty	★
WR5	Five-year limited warranty	★

Plantweb™ control functionality

This option is only available with output code F.

Code	Description	
A01	FOUNDATION™ Fieldbus advanced control function block suite	★

RTD cable

RTD sensor must be ordered separately.

Code	Description	
C12	RTD input with 12 ft. (3.66 m) of shielded cable	★
C13	RTD input with 24 ft. (7.32 m) of shielded cable	★
C14	RTD input with 75 ft. (22.86 m) of shielded cable	★
C22	RTD input with 12 ft. (3.66 m) of armored shielded cable	★
C23	RTD input with 24 ft. (7.32 m) of armored shielded cable	★
C24	RTD input with 75 ft. (22.86 m) of armored shielded cable	★
C32	RTD input with 12 ft. (3.66 m) of ATEX/IECEx flameproof cable	★
C33	RTD input with 24 ft. (7.32 m) of ATEX/IECEx flameproof cable	★
C34	RTD input with 75 ft. (22.86 m) of ATEX/IECEx flameproof cable	★

Mounting bracket

Code	Description	
B4	Coplanar flange bracket, all 316 SST, 2-in. pipe and panel/ bracket	★

Software configuration

Code	Description	
C1	Custom software configuration (requires Configuration Data Sheet)	★

Alarm level

These options require Plantweb™ housing and output code A. Includes hardware adjustments as standard.

This assembly is included with approval options EP, KP, E1, N1, K1, ND, E4, E7, N7, K7, E2, E3, KA, KC, KD, IA, IB, IE, IF, IG, KG, K2, N3, EM, and KM. It is also included with transient protection T1.

Code	Description	
C4	NAMUR alarm and saturation levels, high alarm	★
C5	NAMUR alarm and saturation levels, low alarm	★
C6 ⁽¹⁾	Custom alarm and saturation signal levels, high alarm	★
C7 ⁽¹⁾	Custom alarm and saturation signal levels, low alarm	★
C8	Low alarm (standard Rosemount alarm and saturation levels)	★

(1) Requires C1 and Configuration Data Sheet.

Hardware adjustments

These options requires Plantweb housing and output code A. Includes hardware adjustments as standard.

This assembly is included with approval options EP, KP, E1, N1, K1, ND, E4, E7, N7, K7, E2, E3, KA, KC, KD, IA, IB, IE, IF, IG, KG, K2, N3, EM, and KM. It is also included with transient protection T1.

This option is not available with housing style codes 00, 01, 2E, 2F, 2G, 2M, 5A, 5J, or 7J.

Code	Description	
D1	Hardware adjustments (zero, span, alarm, security)	★

Ground screw

This assembly is included with approval options EP, KP, E1, N1, K1, ND, E4, E7, N7, K7, E2, E3, KA, KC, KD, IA, IB, IE, IF, IG, KG, K2, N3, EM, and KM. It is also included with transient protection T1.

Code	Description	
D4	External ground screw assembly	★

Conduit plug

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

Code	Description	
DO	316 SST conduit plug	★

Customer specified barcode tag

Code	Description	
D6	Barcode tag	★

Product certifications

These options are valid when SuperModule platform and housing have equivalent approvals.

Code	Description	
E1	ATEX Flameproof	★
E5	US Explosion-proof, Dust Ignition-proof	★
E6 ⁽¹⁾	Canada Explosion-proof, Dust Ignition-proof, Division 2	★

Code	Description	
E7	IECEX Flameproof, Dust Ignition-proof	★
I1	ATEX Intrinsic Safety	★
I5	US Intrinsically Safe; Nonincendive	★
I6	Canada Intrinsically Safe	★
I7	IECEX Intrinsic Safety	★
IA	ATEX FISCO Intrinsic Safety (FOUNDATION Fieldbus protocol only)	★
IE	US FISCO Intrinsically Safe (FOUNDATION Fieldbus protocol only)	★
IF	Canada FISCO Intrinsically Safe (FOUNDATION Fieldbus protocol only)	★
IG	IECEX FISCO Intrinsic Safety (FOUNDATION Fieldbus protocol only)	★
K1	ATEX Flameproof, Intrinsic Safety, Type n, Dust	★
K5	US Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K6 ⁽²⁾	Canada Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
K7	IECEX Flameproof, Dust Ignition-proof, Intrinsic Safety, Type n	★
KA ⁽²⁾	ATEX and Canada Flameproof, Intrinsically Safe, Division 2	★
KB ⁽²⁾	US and Canada Explosion-proof, Dust Ignition-proof, Intrinsically Safe, Division 2	★
KC	US and ATEX Explosion-proof, Intrinsically Safe, Division 2	★
KD ⁽²⁾	US, Canada, and ATEX Explosion-proof, Intrinsically Safe	★
KG	US, Canada, ATEX and IECEX FISCO Intrinsic Safety	★
N1	ATEX Type n	★
N7	IECEX Type n	★
ND	ATEX Dust	★

(1) Not available with M20 or G½ conduit entry size.

(2) Not available with output code F, option code DA2, or option code QT.

Display type

These options are not available with housing code 7J.

Code	Description	
M5	Plantweb LCD display	★
M7 ⁽¹⁾⁽²⁾	Remote mount LCD display and interface, Plantweb housing, no cable, SST bracket	★
M8 ⁽²⁾⁽³⁾	Remote mount LCD display and interface, Plantweb housing, 50 ft. (15 m) cable, SST bracket	★
M9 ⁽¹⁾⁽⁴⁾	Remote mount LCD display and interface, Plantweb housing, 100 ft. (31 m) cable, SST bracket	★

(1) This assembly is included with approval options EP, KP, E1, N1, K1, ND, E4, E7, N7, K7, E2, E3, KA, KC, KD, IA, IB, IE, IF, IG, KG, K2, N3, EM, and KM. It is also included with transient protection T1.

(2) See the Rosemount 3051S Reference Manual for cable requirements. Contact an Emerson representative for additional information.

(3) NACE compliant wetted materials are identified by.

(4) NACE compliant wetted materials are identified by materials of construction that comply with metallurgical requirements highlighted within NACE MR0175 for sour oil field production environments.

Pressure testing

Code	Description	
P1	Hydrostatic testing with certificate	

Calibration certificate

Code	Description	
Q4	Calibration certificate	★

Material traceability certification

Code	Description	
Q8	Material traceability certification per EN 10204 3.1B	★

Positive material identification (PMI)

Code	Description	
Q76	PMI verification and certificate	★

Quality certification for safety

Code	Description	
QS ⁽¹⁾⁽²⁾	Prior-use certificate of FMEDA Data	★
QT ⁽³⁾	Safety-certified to IEC 61508 with certificate of FMEDA data	★

- (1) This assembly is included with approval options EP, KP, E1, N1, K1, ND, E4, E7, N7, K7, E2, E3, KA, KC, KD, IA, IB, IE, IF, IG, KG, K2, N3, EM, and KM. It is also included with transient protection T1.
- (2) Transmitter is shipped with 316 SST conduit plug (uninstalled) in place of standard carbon steel conduit plug.
- (3) Not available with output code F or X. Not available with housing code 7J.

Transient protection

This option is not available with housing code 00, 5A, 5J, or 7J.

Code	Description	
T1	Transient terminal block	★

Toolkit performance reports

Code	Description	
QZ	Remote seal system performance calculation report	★

NACE certificate

NACE compliant wetted materials are identified by materials of construction that comply with metallurgical requirements highlighted within NACE MR0175 for sour oil field production environments.

Code	Description	
Q15	Certificate of compliance to NACE MR0175/ISO15156 for wetted materials	★
Q25	Certificate of compliance to NACE MR0103 for wetted materials	★

Specifications

Performance specifications

Rosemount 3051SHP

For zero-based spans, reference conditions, silicone oil fill, C-276 isolating diaphragm, coned and threaded process connections, digital trim values set to equal range points.

Conformance to specification ($\pm 3\sigma$ [Sigma])

Technology leadership, advanced manufacturing techniques, and statistical process control ensure pressure measurement specification conformance to $\pm 3\sigma$ or better.

Reference accuracy

Stated reference accuracy equations include terminal based linearity, hysteresis, and repeatability. For FOUNDATION™ Fieldbus and wireless devices, use calibrated range in place of span.

For transmitters assembled to Rosemount 1199 remote seals, consult factory.

Differential pressure range	Reference accuracy
Range 6	$\pm 0.055\%$ of span; Spans less than 10:1, $\pm [0.005 + 0.01(\text{URL}/\text{Span})]\%$ of span
Range 7	$\pm 0.055\%$ of span; Spans less than 10:1, $\pm [0.015 + 0.005(\text{URL}/\text{span})]\%$ of span
Range 8	$\pm 0.055\%$ of span; Spans less than 5:1, $\pm [0.015 + 0.005(\text{URL}/\text{span})]\%$ of span

Process temperature

The greater of $\pm 0.185^\circ\text{F}$ (0.103°C) or 0.1% of reading per year (excludes RTD sensor stability)

Long term stability

Differential pressure range	Stability
Range 6-8	$\pm 0.35\%$ of URL for 10 years

Process temperature RTD

$\pm 0.67^\circ\text{F}$ (0.37°C)

Warranty

Classic models

- 1-year limited warranty is standard⁽¹⁾

(1) Goods are warranted for twelve (12) months from the date of initial installation of eighteen (18) months from the date of shipment by seller, whichever period expires first.

- Extended 3-year and 5-year limited warranties available if ordered⁽²⁾

Ultra models

- 15-year limited warranty⁽³⁾

Note

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

Dynamic performance

Total response time ^{(4) (5)}	100 ms
Dead time ⁽⁶⁾	45 ms
Sensor update rate ⁽⁷⁾	22 Hz

Ambient temperature effect

Differential pressure range	Ambient temperature effect ⁽¹⁾
Range 6	$\pm 0.035\%$ URL + 0.0625% span from 1:1 to 5:1; $\pm 0.070\%$ + 0.125% span from >5:1 to 50:1
Range 7	$\pm 0.0125\%$ URL + 0.0625% span from 1:1 to 5:1; $\pm 0.025\%$ + 0.125% span from >5:1 to 100:1
Range 8	$\pm 0.0125\%$ URL + 0.0625% span from 1:1 to 5:1; $\pm 0.025\%$ + 0.125% span from >5:1 to 150:1

(1) Temperature effect calculated per 50 °F (28 °C).

Process temperature RTD interface

Minimum span = 0.39 °F (0.216 °C) per 50 °F (28 °C)

Line pressure effect (DP measurement only)

Differential pressure range	Zero error	Span error
Range 6	PS = static pressure in ksi for PS ≤ 4 ksi, 0.28% URL/ksi for PS > 4 ksi, $[1.12 + 0.1(PS-4)]\%$ URL/ksi	$\pm 0.3\%$ of reading per 1000 psi
Range 7	$\pm 0.1\%$ URL per 1000 psi	$\pm 0.2\%$ of reading per 1000 psi
Range 8	$\pm 0.1\%$ URL per 1000 psi	-1.6% $\pm 0.2\%$ of reading per 1000 psi

Mounting position effects

Zero shifts to ± 1.25 in H₂O (6.22 mbar), which can be zeroed.

Span: No effect

(2) 3-year and 5-year warranty apply to date of shipment by seller.

(3) Rosemount Ultra transmitters have a limited warranty of fifteen (15) years from date of shipment. All other provisions of Emerson standard limited warranty remain the same.

(4) For transmitters assembled to Rosemount 1199 remote seals, consult factory.

(5) For FOUNDATION™ Fieldbus (output code F), add 52 ms to stated values (not including segment macro-cycle). For option code DA2, add 45 ms (nominal) to stated values.

(6) For option code DA2, dead time is 90 milliseconds (nominal).

(7) Does not apply to Wireless (output code X). See "IEC 62591 (WirelessHART®)" for wireless update rate.

Vibration effect

Less than $\pm 0.1\%$ 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).

For Housing Style codes 1J, 1K, 1L, 2J, and 2M: Less than $\pm 0.1\%$ of URL when tested per the requirements of IEC60770-1 field with general application or pipeline with low vibration level (10–60 Hz 0.15 mm displacement peak amplitude/60–500 Hz 2g).

Power supply effect

Less than $\pm 0.005\%$ of calibrated span per volt change in voltage at the transmitter terminals

Electromagnetic compatibility (EMC)

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.

Note

During ESD event, Wireless device (Transmitter output code X) may exceed maximum EMC deviation limit or reset, however, device will self-recover and return to normal operation within specified start-up time.

Note

3051SMV Measurement Type 1, 3 and 3051SF Measurement Type 1,3,5,7 require shielded cable for the process temperature connection.

Transient protection (option T1)

Tested in accordance with EEE C62.41.2-2002, Location Category B

- 6 kV crest (0.5 μ s - 100 kHz)
- 3 kA crest (8 20 microseconds)
- 6 kV crest (1.2 50 microseconds)

Functional specifications

Range and sensor limits

Differential pressure range	LRL	URL
Range 6	-250 inH ₂ O (-623 mbar)	250 inH ₂ O (623 mbar)
Range 7	-700 inH ₂ O (-1,74 bar)	700 inH ₂ O (1,74 bar)
Range 8	-150 psi (-10,34 bar)	150 psi (10,34 bar)

Process temperature RTD interface

LRL	URL
-328 °F (-200 °C)	1562 °F (850 °C)

Minimum span limits

For transmitters assembled to Rosemount 1199 remote seals, consult factory.

Differential pressure range	Limit
Range 6	5 inH ₂ O (12,44 mbar)
Range 7	7 inH ₂ O (17,42 mbar)
Range 8	1 psi (68,95 mbar)

Process temperature RTD interface

52 °F (11 °C)

Service

Rosemount 3051SHP (DP only): Liquid, gas, and vapor applications

Rosemount 3051SHP (DP + Temperature): Liquids, saturated steam

Process temperature RTD

±0.67 °F (0.37 °C)

4–20 mA HART® protocol**Zero and span adjustment**

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

Output

Two-wire 4–20 mA is user-selectable for linear or square root output. Digital process variable superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol.

Power supply

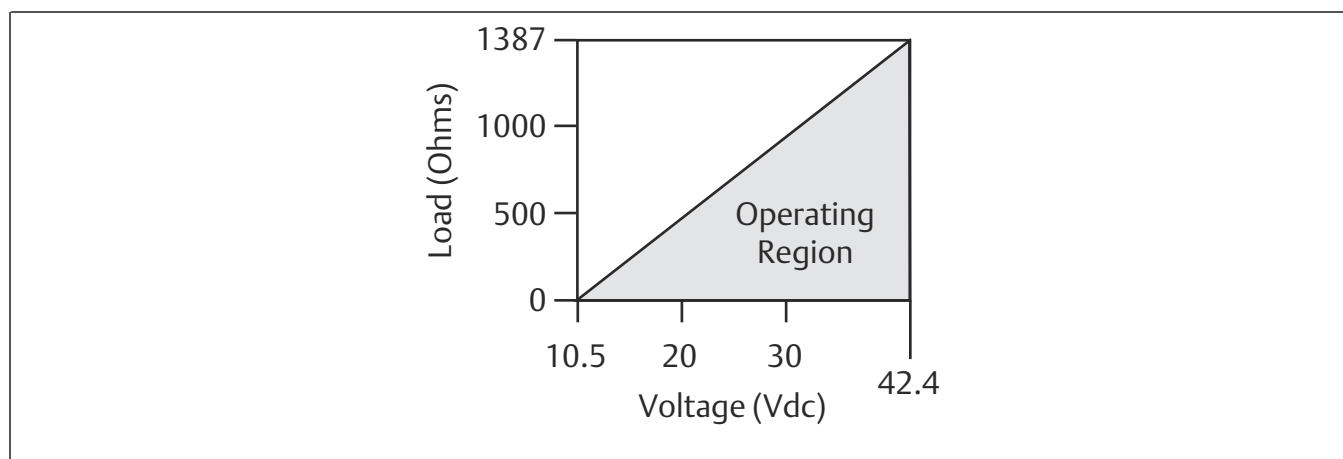
External power supply required.

- Rosemount 3051S: 10.5 to 42.4 Vdc with no load
- Rosemount 3051S with Advanced HART Diagnostics Suite: 12 to 42.4 Vdc with no load

Load limitations

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

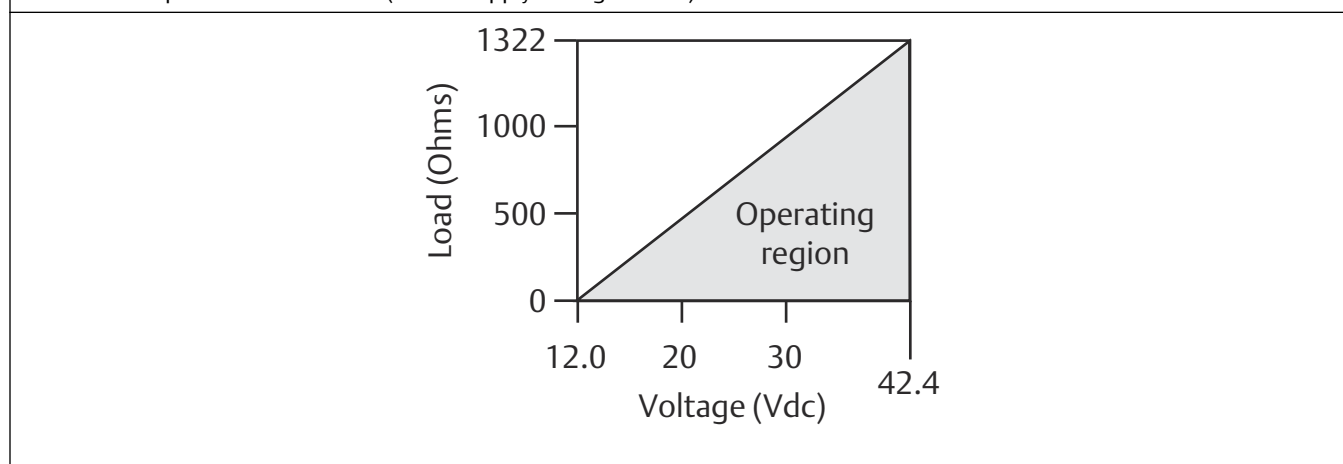
Rosemount 3051SHP
Maximum Loop Resistance = $43.5 * (\text{Power Supply Voltage} - 10.5)$



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

Rosemount 3051SHP, 3051SHP with HART Diagnostics (option code DA2), and 3051SHP with DP + T measurement

Maximum Loop Resistance = $43.5 \times (\text{Power Supply Voltage} - 12.0)$



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

Advanced HART Diagnostics Suite (Option Code DA2)

Statistical Process Monitoring (SPM) provides statistical data (standard deviation, mean, coefficient of variation) that can be used to detect process and process equipment anomalies, including plugged impulse lines, air entrainment, pump cavitation, furnace flame instability, distillation column flooding and more. This diagnostic allows you to take preventative measures before abnormal process situations result in unscheduled downtime or rework.

Power Advisory diagnostic pro-actively detects and notifies you of degraded electrical loop integrity before it can affect your process operation. Example loop problems that can be detected include water in the terminal compartment, corrosion of terminals, improper grounding, and unstable power supplies.

The Device Dashboard presents the diagnostics in a graphical, task-based interface that provides single click access to critical process/device information and descriptive graphical troubleshooting.

Suite includes: Statistical Process Monitoring (SPM), Power Advisory, Status Log, Variable Log, Advanced Process Alerts, Service Alerts, and Time Stamp capability.

FOUNDATION Fieldbus

Power supply

External power supply required; transmitters operate on 9.0 to 32.0 Vdc transmitter terminal voltage.

Current draw

17.5 mA for all configurations (including LCD display option)

FOUNDATION Fieldbus Parameters

Schedule entries	14 (max.)
Links	30 (max.)
Virtual Communications Relationships (VCR)	20 (max.)

Standard function blocks

Resource block	Contains hardware, electronics, and diagnostic information.
Transducer block	Contains actual sensor measurement data including the sensor diagnostics and the ability to trim the pressure sensor or recall factory defaults.
LCD display block	Configures the local display.
2 Analog input blocks	Processes the measurements for input into other function blocks. The output value is in engineering or custom units and contains a status indicating measurement quality.
PID block with auto-tune	Contains all logic to perform PID control in the field including cascade and feed forward. Auto-tune capability allows for superior tuning for optimized control performance.

Backup Link Active Scheduler (LAS)

The transmitter can function as a link active scheduler if the current link master device fails or is removed from the segment.

Software upgrade in the field

Software for the Rosemount 3051S with FOUNDATION Fieldbus is easy to upgrade in the field using the FOUNDATION Fieldbus “Common Device Software Download” procedure.

Plantweb alerts

Enable the full power of the Plantweb digital architecture by diagnosing instrumentation issues, communicating advisory, maintenance, and failure details, and recommending a solution.

Advanced control function block suite (Option Code A01)

Input selector block	Selects between inputs and generates an output using specific selection strategies such as minimum, maximum, midpoint, average, or first “good.”
Arithmetic block	Provides pre-defined application-based equations including flow with partial density compensation, electronic remote sensors, hydrostatic tank gauging, ratio control and others.
Signal characterizer block	Characterizes or approximates any function that defines an input/output relationship by configuring up to twenty X, Y coordinates. The block interpolates an output value for a given input value using the curve defined by the configured coordinates.
Integrator block	Compares the integrated or accumulated value from one or two variables to pre-trip and trip limits and generates discrete output signals when the limits are reached. This block is useful for calculating total flow, total mass, or volume over time.
Output splitter block	Splits the output of one PID or other control block so that the PID will control two valves or other actuators.

Control selector block

Selects one of up to three inputs (highest, middle, or lowest) that are normally connected to the outputs of PID or other control function blocks.

Block	Execution time
Resource	N/A
Transducer	N/A
LCD display block	N/A
Analog input 1, 2	20 milliseconds
PID with auto-tune	35 milliseconds
Input selector	20 milliseconds
Arithmetic	20 milliseconds
Signal characterizer	20 milliseconds
Integrator	20 milliseconds
Output splitter	20 milliseconds
Control selector	20 milliseconds

Fully compensated mass flow block (Option Code H01)

Calculates fully compensated mass flow based on differential pressure with external process pressure and temperature measurements over the Fieldbus segment. Configuration for the mass flow calculation is easily accomplished using the Rosemount Engineering Assistant 5.5.1 software.

FOUNDATION Fieldbus Diagnostics Suite (Option Code D01)

Statistical process monitoring (SPM) provides statistical data (standard deviation and mean) that can be used to detect process and process equipment anomalies, including plugged impulse lines, air entrainment, pump cavitation, furnace flame instability, distillation column flooding, and more. This diagnostic allows you to take preventative measures before abnormal process situations result in unscheduled downtime or rework.

The Device Dashboard presents the diagnostics in a graphical, task-based interface that provides single click access to critical process/device information and descriptive graphical troubleshooting.

Suite includes: statistical process monitoring (SPM) and plugged impulse line detection (PIL).

IEC 62591 (WirelessHART®)**Output**

IEC 62591 (WirelessHART), 2.4 GHz DSSS

Radio frequency power output from antenna

- External antenna (WK option):

Maximum of 10 mW (10 dBm) EIRP

- Extended range, external antenna (WM option):

Maximum of 18 mW (12.5 dBm) EIRP

- Remote (WJ option) antenna:

Maximum of 17 mW (12.3 dBm) EIRP

- High-gain, remote antenna (WN option):

Maximum of 40 mW (16 dBm) EIRP

Local display

The optional seven-digit LCD display can display user-selectable information such as primary variable in engineering units, percent of range, sensor module temperature, and electronics temperature. The display updates based on the wireless update rate.

Update rate

User selectable 1 sec. to 60 min.

Power module

Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with polybutadiene terephthalate (PBT) enclosure. Ten-year life at one minute update rate.⁽⁸⁾

Overpressure limits

Pressure range	Overpressure limit
Rosemount 3051SHP, Static	22,500 psi (1.551 bar)
Rosemount 3051SHP, DP	15,000 psi (1.034 bar)

Maximum working pressure limits

Maximum working pressure is the maximum pressure allowed for normal transmitter operation. For a differential pressure transmitter, the maximum working pressure is the static line pressure under which the transmitter can safely operate. If one side of the transmitter is exposed to the full static line pressure due to mis-valving, the transmitter will experience an output shift and must be re-zeroed. For a gage or absolute pressure transmitter, the maximum working pressure is the same as the Upper Range Limit (URL). The maximum working pressure of transmitters with assemble-to options is limited by the lowest maximum pressure rating of the individual components.

The maximum working pressure of the transmitter is specified in the model number of the product and is rated up to 15,000 psi (1.034 bar).

Static pressure limits for the Rosemount 3051SHP

Operates within specifications between static line pressures of: 0.5 psia to 15,000 psig (0.03 to 1.034,21 bar) for transmitters with a maximum working pressure of 15,000 psig.

Burst pressure limits

3051SHP: 37,500 psi (2.585 bar)

Temperature limits

Ambient -40 to 185 °F (-40 to 85 °C)
With LCD display⁽⁹⁾: -40 to 175 °F (-40 to 80 °C)

Storage -50 to 185 °F (-46 to 85 °C)
With LCD display: -40 to 185 °F (-40 to 85 °C)
With wireless output: -40 to 185 °F (-40 to 85 °C)

Process At atmospheric pressures and above:

(8) Reference conditions are 70 °F (21 °C), and routing data for three additional network devices. Note: Continuous exposure to ambient temperature limits of -40 °F or 185 °F (-40 °C or 85 °C) may reduce specified life by less than 20 percent.

(9) LCD display may not be readable and LCD display updates will be slower at temperatures below -4 °F (-20 °C).

Coplanar sensor module	
Silicone fill sensor ⁽¹⁾	-40 to 250 °F (-40 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: $(195\text{ °F} - 185\text{ °F}) \times 1.5 = 15\text{ °F}$, $185\text{ °F} - 15\text{ °F} = 170\text{ °F}$

Indication

Optional three-line LCD display

Zero and span adjustment requirements

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

Humidity limits

0–100% relative humidity

Turn-on time⁽¹⁰⁾

When power is applied to the transmitter during startup, performance will be within specification per the time period described below:

Rosemount 3051SHP DP: 2 seconds (assumed the same value as 3051S)

Rosemount 3051SHP DP + T: 5 seconds

Volumetric displacement

Less than 0.0005 in.³ (0,008 cm³)

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.

For 3051SHP DP + T each variable can be individually adjusted.

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

4-20 mA HART(output option code A)

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

High or low alarm signal is software-selectable or hardware-selectable via the optional switch (option D1).

Alarm configuration

	High alarm	Low alarm
Default	$\geq 21.75\text{ mA}$	$\leq 3.75\text{ mA}$
NAMUR ⁽¹⁾	$\geq 22.5\text{ mA}$	$\leq 3.6\text{ mA}$

(10) Does not apply to wireless option code X.

	High alarm	Low alarm
Custom levels ⁽²⁾⁽³⁾	20.2 - 23.0 mA	3.4 - 3.8 mA

(1) Analog output levels are compliant with NAMUR recommendation NE 43, see option codes C4 or C5.

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

(3) For option code DA2, low alarm custom values are 3.6 - 3.8 mA.

Safety-Certified Transmitter Failure Values⁽¹¹⁾

Device Safety accuracy: $\pm 2.0\%$ of analog output span ⁽¹²⁾ Device Safety response time: 1.5 seconds

IEC 62591 (WirelessHART®)

Output

IEC 62591 (WirelessHART), 2.4 GHz DSSS

Radio frequency power output from antenna

■ External antenna (WK option):

Maximum of 10 mW (10 dBm) EIRP

■ Extended range, external antenna (WM option):

Maximum of 18 mW (12.5 dBm) EIRP

■ Remote (WJ option) antenna:

Maximum of 17 mW (12.3 dBm) EIRP

■ High-gain, remote antenna (WN option):

Maximum of 40 mW (16 dBm) EIRP

Local display

The optional seven-digit LCD display can display user-selectable information such as primary variable in engineering units, percent of range, sensor module temperature, and electronics temperature. The display updates based on the wireless update rate.

Update rate

User selectable 1 sec. to 60 min.

Power module

Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride Power Module with polybutadine terephthalate (PBT) enclosure. Ten-year life at one minute update rate.⁽¹³⁾

Overpressure limits

Pressure range	Overpressure limit
Rosemount 3051SHP, Static	22,500 psi (1.551 bar)
Rosemount 3051SHP, DP	15,000 psi (1.034 bar)

(11) Does not apply to wireless option code X.

(12) Trip values in the DCS or safety logic solver should be derated by this device safety accuracy.

(13) Reference conditions are 70 °F (21 °C), and routing data for three additional network devices. Note: Continuous exposure to ambient temperature limits of -40 °F or 185 °F (-40 °C or 85 °C) may reduce specified life by less than 20 percent.

Maximum working pressure limits

Maximum working pressure is the maximum pressure allowed for normal transmitter operation. For a differential pressure transmitter, the maximum working pressure is the static line pressure under which the transmitter can safely operate. If one side of the transmitter is exposed to the full static line pressure due to mis-valving, the transmitter will experience an output shift and must be re-zeroed. For a gage or absolute pressure transmitter, the maximum working pressure is the same as the Upper Range Limit (URL). The maximum working pressure of transmitters with assemble-to options is limited by the lowest maximum pressure rating of the individual components.

The maximum working pressure of the transmitter is specified in the model number of the product and is rated up to 15,000 psi (1.034 bar).

Static pressure limits for the Rosemount 3051SHP

Operates within specifications between static line pressures of: 0.5 psia to 15,000 psig (0,03 to 1.034,21 bar) for transmitters with a maximum working pressure of 15,000 psig.

Burst pressure limits

3051SHP: 37,500 psi (2.585 bar)

Temperature limits

Ambient -40 to 185 °F (-40 to 85 °C)

With LCD display⁽¹⁴⁾: -40 to 175 °F (-40 to 80 °C)

Storage -50 to 185 °F (-46 to 85 °C)

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

With wireless output: -40 to 185 °F (-40 to 85 °C)

Process At atmospheric pressures and above:

Coplanar sensor module	
Silicone fill sensor ⁽¹⁾	-40 to 250 °F (-40 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: $(195^{\circ}\text{F} - 185^{\circ}\text{F}) \times 1.5 = 15^{\circ}\text{F}$, $185^{\circ}\text{F} - 15^{\circ}\text{F} = 170^{\circ}\text{F}$

Indication

Optional three-line LCD display

Zero and span adjustment requirements

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

Humidity limits

0–100% relative humidity

Turn-on time⁽¹⁵⁾

When power is applied to the transmitter during startup, performance will be within specification per the time period described below:

Rosemount 3051SHP DP: 2 seconds (assumed the same value as 3051S)

Rosemount 3051SHP DP + T: 5 seconds

(14) LCD display may not be readable and LCD display updates will be slower at temperatures below -4 °F (-20 °C).

(15) Does not apply to wireless option code X.

Volumetric displacement

Less than 0.0005 in.³ (0,008 cm³)

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.

For 3051SHP DP + T each variable can be individually adjusted.

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

4-20 mA HART(output option code A)

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

High or low alarm signal is software-selectable or hardware-selectable via the optional switch (option D1).

Alarm configuration

	High alarm	Low alarm
Default	≥ 21.75 mA	≤ 3.75 mA
NAMUR ⁽¹⁾	≥ 22.5 mA	≤ 3.6 mA
Custom levels ⁽²⁾⁽³⁾	20.2 - 23.0 mA	3.4 - 3.8 mA

(1) Analog output levels are compliant with NAMUR recommendation NE 43, see option codes C4 or C5.

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

(3) For option code DA2, low alarm custom values are 3.6 - 3.8 mA.

Safety-Certified Transmitter Failure Values⁽¹⁶⁾

Device Safety accuracy: ± 2.0% of analog output span ⁽¹⁷⁾ Device Safety response time: 1.5 seconds

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, G½, and M20 × 1½ conduit. HART® interface connections fixed to terminal block for Output code A and X.

(16) Does not apply to wireless option code X.

(17) Trip values in the DCS or safety logic solver should be derated by this device safety accuracy.

Process connections

Autoclave connection

Process-wetted parts**Process isolating diaphragms** Coplanar sensor module: Alloy C-276 (UNS N10276)**Non-wetted parts****Electronics housing** Low-copper aluminum alloy or CF-8M (Cast 316 SST) NEMA® 4X, IP 66, IP 68 (66 ft (20 m) for 168 hours)**Note**

IP 68 not available with wireless output.

Coplanar sensor module housing**Rosemount 3051SHP** C-276 module base, CF-3M (Cast 316L SST) upper module housing**Sensor module fill fluid** Silicone is standard.**Paint for aluminum housing** Polyurethane**Cover O-rings** Buna-N**Wireless antenna****External antenna (WK/WM)** PBT/PC integrated omni-directional antenna**Remote antenna (WN)** Fiberglass omni-directional antenna**Power module** Field replaceable, keyed connection eliminates the risk of incorrect installation, Intrinsically Safe Lithium-thionyl chloride power module with PBT enclosure**Shipping weights****Sensor module weights****Sensor module** 4.49 lb (2.04 kg)**Table 1: Transmitter weights⁽¹⁾**

Transmitter with sensor module	
Junction Box housing, direct process connection	5.64 lb (2,56 kg)
Plantweb housing, direct process connection	6.04 lb (2,74 kg)
Wireless Plantweb housing, direct process connection	6.64 lb (3,01 kg)

⁽¹⁾ Fully functional transmitter with sensor module, housing, terminal block, and covers. Does not include LCD display.**Table 2: Transmitter option weights**

Option code	Option	Add lb (kg)
1J, 1K, 1L	SST Plantweb housing	3.5 (1.6)
2J	SST Junction Box housing	3.4 (1.5)
7J	SST Quick Connect	0.4 (0.2)
2A, 2B, 2C	Aluminum Junction Box housing	1.1 (0.5)
1A, 1B, 1C	Aluminum Plantweb housing	1.1 (0.5)
M5 ⁽¹⁾	LCD display for aluminum Plantweb housing	0.8 (0.4)
	LCD display for SST Plantweb housing	1.6 (0.7)

Table 2: Transmitter option weights (continued)

Option code	Option	Add lb (kg)
B4	SST mounting bracket for coplanar flange	1.2 (0.5)

(1) Includes LCD display and display cover.

Table 3: Transmitter component weights

Item	Weight in lb. (kg)
Aluminum standard cover	0.4 (0.2)
SST standard cover	1.3 (0.6)
Aluminum display cover	0.7 (0.3)
SST display cover	1.5 (0.7)
Wireless extended cover	0.7 (0.3)
LCD display ⁽¹⁾	0.1 (0.04)
Junction box terminal block	0.2 (0.1)
Plantweb terminal block	0.2 (0.1)
Power module	0.5 (0.2)

(1) Display only

Product certifications

Rev 2.7

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).

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.

Installing Equipment in North America

The US National Electrical Code® (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA

E5 US Explosionproof, Dust Ignition-proof

Certificate 1143113

Standards FM Class 3600 - 2011, FM Class 3615 - 2006, FM Class 3810 - 2005, UL 1203 5th Ed., UL 50E 1st Ed., UL 61010-1 (3rd Edition)

Markings XP CL I, DIV 1, GP B, C, D; T5; DIP CL II, DIV 1, GP E, F, G; CL III; $-50^{\circ}\text{C} \leq T_a \leq +85^{\circ}\text{C}$; Seal Not Required; Type 4X

I5 US Intrinsically Safe; Nonincendive

Certificate 1143113

Standards FM Class 3600 - 2011, FM Class 3610 - 2010, FM Class 3611 - 2004, FM Class 3810 - 2005, UL 50E 1st Ed., UL 61010-1 (3rd Edition)

Markings IS CL I,II,III, DIV 1, GP A, B, C, D, E, F, G, T4; Class 1, Zone 0 AEx ia IIC T4 ($-50^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$) [HART]; T4($-50^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$) [Fieldbus]; NI CL 1, DIV 2, GP A, B, C, D, T5, $T_a = 70^{\circ}\text{C}$; Rosemount drawing 03251-1006; Type 4X

IE US FISCO Intrinsically Safe

Certificate 1143113

Standards FM Class 3600 - 2011, FM Class 3610 - 2010, FM Class 3810 - 2005, UL 50E 1st Ed., UL 61010-1 (3rd Edition)

Markings IS CL I, DIV 1, GP A, B, C, D, T4($-50^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$); Class 1, Zone 0 AEx ia IIC T4; Rosemount drawing 03251-1006; Type 4X

Canada

E6 Canada Explosion-proof, Dust Ignition-proof, Division 2

Certificate 1143113

Standards CAN/CSA C22.2 No. 0-10, CSA C22.2 No. 25-1966 (R2014), CSA C22.2 No. 30-M1986 (R2012), CSA C22.2 No. 94.2-07, CSA C22.2 No. 213-M1987 (R2013), CAN/CSA-C22.2 No. 61010-1-12, ANSI/ISA 12.27.01-2011

Markings Class I, Groups B, C, D, $-50^{\circ}\text{C} \leq T_a \leq +85^{\circ}\text{C}$; Class II, Groups E, F, G; Class III; suitable for Class I, Zone 1, Group IIB+H2, T5; Class I, Division 2, Groups A, B, C, D; suitable for Class I, Zone 2, Group IIC, T5; Seal Not Required; Dual Seal; Type 4X

I6 Canada Intrinsically Safe

Certificate 1143113

Standards CAN/CSA C22.2 No. 0-10, CAN/CSA-60079-0-11, CAN/CSA C22.2 No. 60079-11:14, CSA C22.2 No. 94.2-07, ANSI/ISA 12.27.01-2011

Markings Intrinsically Safe Class I, Division 1; Groups A, B, C, D; suitable for Class 1, Zone 0, IIC, T3C, $T_a = 70^{\circ}\text{C}$; Rosemount drawing 03251-1006; Dual Seal; Type 4X

IF Canada FISCO Intrinsically Safe

Certificate 1143113

Standards CAN/CSA C22.2 No. 0-10, CAN/CSA-60079-0-11, CAN/CSA C22.2 No. 60079-11:14, CSA C22.2 No. 94.2-07, ANSI/ISA 12.27.01-2011

Markings Intrinsically Safe Class I, Division 1; Groups A, B, C, D; suitable for Class 1, Zone 0, IIC, T3C, $T_a = 70^{\circ}\text{C}$; Rosemount drawing 03251-1006; Dual Seal; Type 4X

Europe

E1 ATEX Flameproof

Certificate DEKRA 15ATEX0108X

Standards EN 60079-0:2012 + A11:2013, EN60079-1:2014, EN60079-26:2015

Markings  II 1/2 G Ex db IIC T6...T4 Ga/Gb, T6 ($-60^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$), T4/T5 ($-60^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$); $V_{\text{max}} = 42.4 \text{ VDC}$

Temperature class	Process connection temperature	Ambient temperature
T6	-60°C to $+70^{\circ}\text{C}$	-60°C to $+70^{\circ}\text{C}$
T5	-60°C to $+80^{\circ}\text{C}$	-60°C to $+80^{\circ}\text{C}$
T4	-60°C to $+120^{\circ}\text{C}$	-60°C to $+80^{\circ}\text{C}$

Special Conditions for Safe Use (X):

1. This device contains a thin wall diaphragm less than 1 mm thickness that forms a boundary between zone 0 (process connection) and zone 1 (all other parts of the equipment). The model code and datasheet are to be consulted for details of the diaphragm material. 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.
4. Appropriate cable, glands and plugs need to be suitable for a temperature of 5°C greater than maximum specified temperature for location where installed.

I1 ATEX Intrinsic Safety

Certificate	BAS01ATEX1303X
Standards	EN 60079-0:2012, EN 60079-11:2012
Markings	Ⓔ II 1 G Ex ia IIC T4 Ga, T4(−60 °C ≤ T _a ≤ +70 °C)

Model	U _i	I _i	P _i	C _i	L _i
SuperModule™	30 V	300 mA	1.0 W	30 nF	0
3051S...A; 3051SF...A; 3051SAL...C; 3051SHP... D...A	30 V	300 mA	1.0 W	12 nF	0
3051S...F; 3051SF...F; 3051SHP...D...F	30 V	300 mA	1.3 W	0	0
3051S...F...IA; 3051SF ... F...IA; 3051SHP...D...F... IA	17.5 V	380 mA	5.32 W	0	0
3051S ...A...M7, M8, or M9; 3051SF ...A...M7, M8, or M9; 3051SAL...C... M7, M8, or M9; 3051SHP...D... M7, M8, or M9;	30 V	300 mA	1.0 W	12 nF	60 μH
3051SAL; 3051SAM	30 V	300 mA	1.0 W	12 nF	33 μH
3051SAL...M7, M8, or M9 3051SAM...M7, M8, or M9	30 V	300 mA	1.0 W	12 nF	93 μH
RTD option for 3051SF	5 V	500 mA	0.63 W	N/A	N/A
3051SHP...7...A	30 V	300 mA	1.0 W	14.8 nF	0
RTD option for 3051SHP...7...A	30 V	2.31 mA	17.32 mW	N/A	N/A
3051SHP...7...F	30 V	300 mA	1.3 W	0	0
3051SHP...7...F...IA	17.5 V	380 mA	5.32 W	0	0
RTD option for 3051SHP...7...F	30 V	18.24 mA	137 mW	0.8 nF	1.33 mH

Special Conditions for Safe Use (X):

1. The Rosemount 3051S Transmitters fitted with transient protection are not capable of withstanding the 500 V test as defined in Clause 6.3.13 of EN 60079-11:2012. This must be taken into account during installation.
2. The terminal pins of the Rosemount 3051S SuperModule must be provided with a degree of protection of at least IP20 in accordance with IEC/EN 60529.
3. The Rosemount 3051S 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 area.

IA ATEX FISCO

Certificate	BAS01ATEX1303X
Standards	EN 60079-0:2012, EN 60079-11:2012
Markings	Ⓔ II 1 G Ex ia IIC T4 Ga, T4(−60 °C ≤ T _a ≤ +70 °C)

Parameter	FISCO
Voltage U _i	17.5 V
Current I _i	380 mA
Power P _i	5.32 W
Capacitance C _i	0
Inductance L _i	0

Special Conditions for Safe Use (X):

1. The Rosemount 3051S Transmitters fitted with transient protection are not capable of withstanding the 500 V test as defined in Clause 6.3.13 of EN 60079-11:2012. This must be taken into account during installation.
2. The terminal pins of the Rosemount 3051S SuperModule must be provided with a degree of protection of at least IP20 in accordance with IEC/EN 60529.
3. The Rosemount 3051S 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 area.

ND ATEX Dust

Certificate	BAS01ATEX1374X
Standards	EN 60079-0:2012, EN 60079-31:2009
Markings	Ⓔ II 1 D Ex ta IIIC T105 °C T ₅₀₀ 95 °C Da, (−20 °C ≤ T _a ≤ +85 °C), V _{max} = 42.4 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 temperature range of the apparatus and capable of withstanding a 7 J impact test.
4. The SuperModule(s) must be securely screwed in place to maintain the ingress protection of the enclosure(s).

N1 ATEX Type n

Certificate	BAS01ATEX3304X
Standards	EN 60079-0:2012, EN 60079-15:2010
Markings	Ⓔ II 3 G Ex nA IIC T5 Gc, (−40 °C ≤ T _a ≤ +85 °C), V _{max} = 45 V

Special Condition for Safe Use (X):

1. The equipment is not capable of withstanding the 500 V insulation test required by clause 6.5 of EN 60079-15:2010. This must be taken into account when installing the equipment.

Note

RTD Assembly is not included with the Rosemount 3051SFX Type n Approval.

International

E7 IECEx Flameproof and Dust

Certificate IECEx DEK 15.0072X, IECEx BAS 09.0014X

Standards IEC 60079-0:2011, IEC 60079-1:2014, IEC 60079-26:2014, IEC 60079-31:2008

Markings Ex db IIC T6...T4 Ga/Gb, T6 ($-60^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$), T4/T5 ($-60^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$); $V_{\text{max}} = 42.4 \text{ VDC}$ Ex ta IIIC T105 $^{\circ}\text{C}$ T₅₀₀ 95 $^{\circ}\text{C}$ Da ($-20^{\circ}\text{C} \leq T_a \leq +85^{\circ}\text{C}$)

Temperature class	Process connection temperature	Ambient temperature
T6	-60°C to $+70^{\circ}\text{C}$	-60°C to $+70^{\circ}\text{C}$
T5	-60°C to $+80^{\circ}\text{C}$	-60°C to $+80^{\circ}\text{C}$
T4	-60°C to $+120^{\circ}\text{C}$	-60°C to $+80^{\circ}\text{C}$

Special Conditions for Safe Use (X):

1. This device contains a thin wall diaphragm less than 1 mm thickness that forms a boundary between zone 0 (process connection) and zone 1 (all other parts of the equipment). The model code and datasheet are to be consulted for details of the diaphragm material. 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.
4. Appropriate cable, glands and plugs need to be suitable for a temperature of 5 $^{\circ}\text{C}$ greater than maximum specified temperature for location where installed.
5. Cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
6. Unused cable entries must be filled with suitable blanking plugs which maintain the ingress protection of the enclosure to at least IP66.
7. Cable entries and blanking plugs must be suitable for the ambient temperature range of the apparatus and capable of withstanding a 7 J impact test.
8. The Rosemount 3051S SuperModule must be securely screwed in place to maintain the ingress protection of the enclosure.

I7 IECEx Intrinsic Safety

Certificate IECEx BAS 04.0017X

Standards IEC 60079-0:2011, IEC 60079-11:2011

Markings Ex ia IIC T4 Ga, T4 ($-60^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)

Model	U_i	I_i	P_i	C_i	L_i
SuperModule	30 V	300 mA	1.0 W	30 nF	0
3051S...A; 3051SF...A; 3051SAL...C; 3051SHP... D...A	30 V	300 mA	1.0 W	12 nF	0
3051S...F; 3051SF...F; 3051SHP...D...F	30 V	300 mA	1.3 W	0	0

Model	U _i	I _i	P _i	C _i	L _i
3051S...F...IA; 3051SF ... F...IA; 3051SHP...D...F... IA	17.5 V	380 mA	5.32 W	0	0
3051S ...A...M7, M8, or M9; 3051SF ...A...M7, M8, or M9; 3051SAL...C... M7, M8, or M9; 3051SHP...D... M7, M8, or M9	30 V	300 mA	1.0 W	12 nF	60 µH
3051SAL; 3051SAM	30 V	300 mA	1.0 W	12 nF	33 µH
3051SAL...M7, M8, or M9 3051SAM...M7, M8, or M9	30 V	300 mA	1.0 W	12 nF	93 µH
RTD option for 3051SF	5 V	500 mA	0.63 W	N/A	N/A
3051SHP...7...A	30 V	300 mA	1.0 W	14.8 nF	0
RTD option for 3051SHP...7...A	30 V	2.31 mA	17.32 mW	N/A	N/A
3051SHP...7...F	30 V	300 mA	1.3 W	0	0
3051SHP...7...F...IA	17.5 V	380 mA	5.32 W	0	0
RTD option for 3051SHP...7...F	30 V	18.24 mA	137 mW	0.8 nF	1.33 mH

Special Conditions for Safe Use (X):

1. The Rosemount 3051S Transmitters fitted with transient protection are not capable of withstanding the 500 V test as defined in Clause 6.3.13 of EN 60079-11:2012. This must be taken into account during installation.
2. The terminal pins of the Rosemount 3051S SuperModule must be provided with a degree of protection of at least IP20 in accordance with IEC/EN 60529.
3. The Rosemount 3051S 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 area.

IG IECEx FISCO

Certificate	IECEx BAS 04.0017X
Standards	IEC 60079-0: 2011, IEC 60079-11: 2011
Markings	Ex ia IIC T4 Ga, T4(−60 °C ≤ T _a ≤ +70 °C)

Parameter	FISCO
Voltage U _i	17.5 V
Current I _i	380 mA
Power P _i	5.32 W
Capacitance C _i	0
Inductance L _i	0

Special Conditions for Safe Use (X):

1. The Rosemount 3051S Transmitters fitted with transient protection are not capable of withstanding the 500 V test as defined in Clause 6.3.13 of EN 60079-11:2012. This must be taken into account during installation.
2. The terminal pins of the Rosemount 3051S SuperModule must be provided with a degree of protection of at least IP20 in accordance with IEC/EN 60529.
3. The Rosemount 3051S 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 area.

N7 IECEx Type n

Certificate	IECEx BAS 04.0018X
Standards	IEC 60079-0: 2011, IEC 60079-15: 2010
Markings	Ex nA IIC T5 Gc, $(-40^{\circ}\text{C} \leq T_a \leq +85^{\circ}\text{C})$

Special Condition for Safe Use (X):

1. The equipment is not capable of withstanding the 500 V insulation test required by clause 6.5 of EN 60079-15:2010. This must be taken into account when installing the equipment.

EAC - Belarus, Kazakhstan, Russia**EM Technical Regulation Customs Union (EAC) Flameproof and Dust**

Certificate	RU C-US.AA87.B.00378
Markings	Ga/Gb Ex d IIC T6...T4 X Ex tb IIIC T105 °C T ₅₀₀ 95 °C Db X Ex ta IIIC T105 °C T ₅₀₀ 95 °C Da X

See certificate for special conditions for safe use.

IM Technical Regulation Customs Union (EAC) Intrinsic Safety

Certificate	RU C-US.AA87.B.00378
Markings	0Ex ia IIC T4 Ga X

See certificate for special conditions for safe use.

Combinations

K1 Combination of E1, I1, N1, and ND

K7 Combination of E7, I7, and N7

KC Combination of E1, E5, I1, and I5

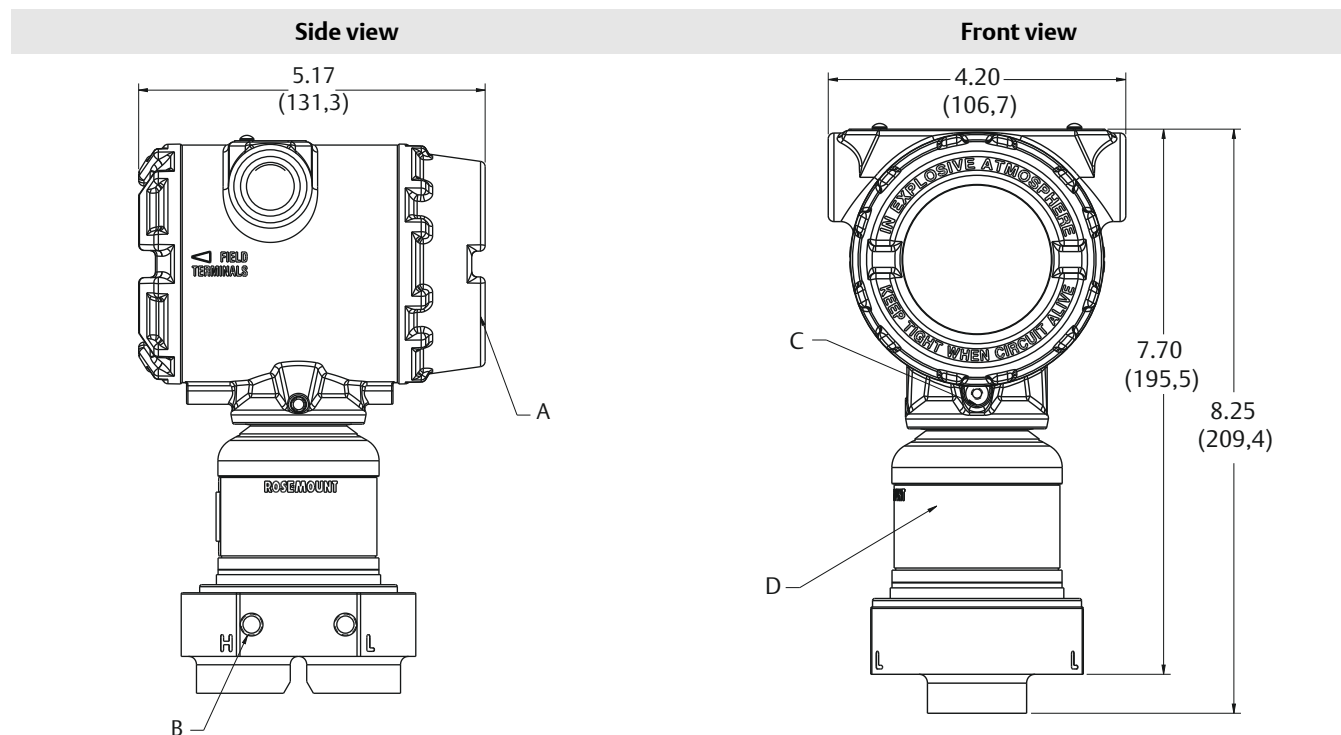
KD Combination of E1, E5, E6, I1, I5, and I6

KG Combination of IA, IE, IF, and IG

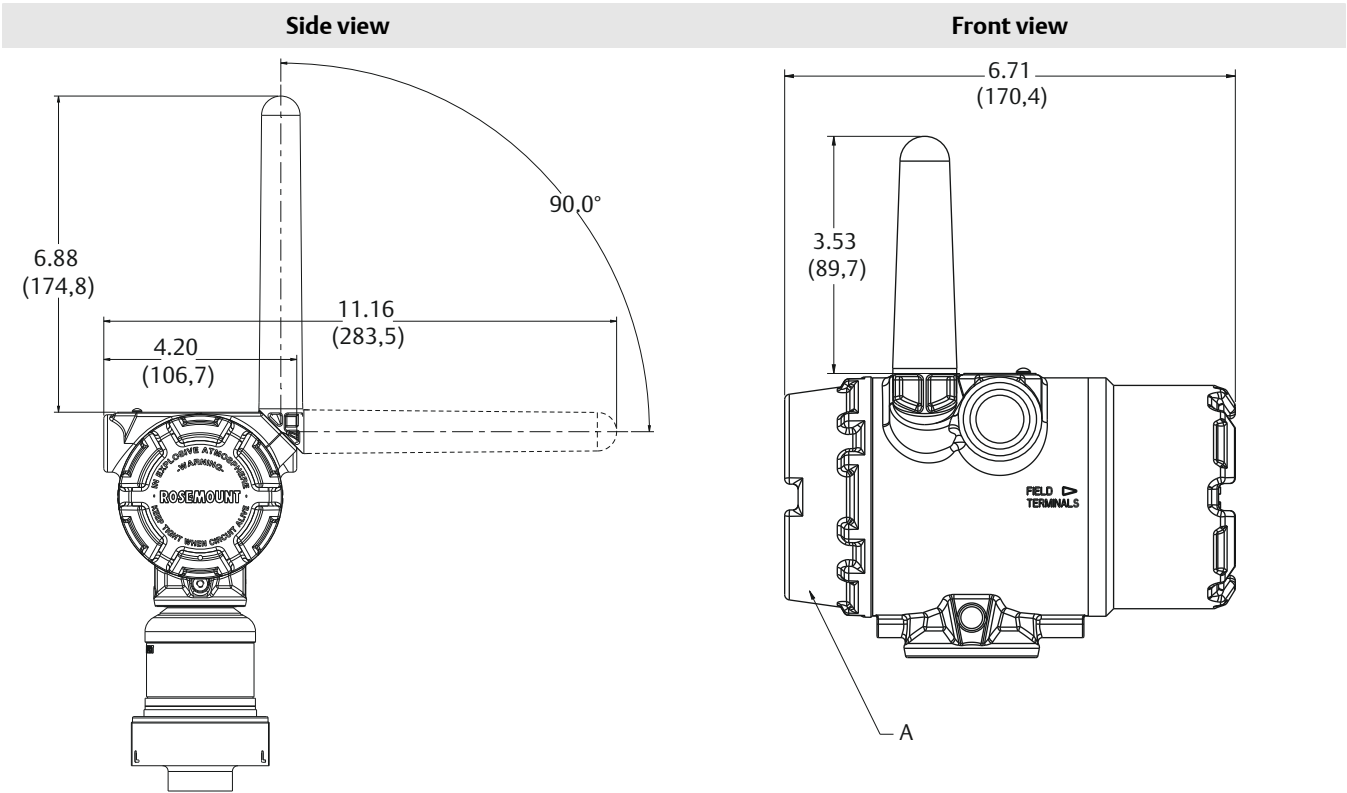
KM Combination of EM and IM

Dimensional drawings

Figure 2: Plantweb Housing



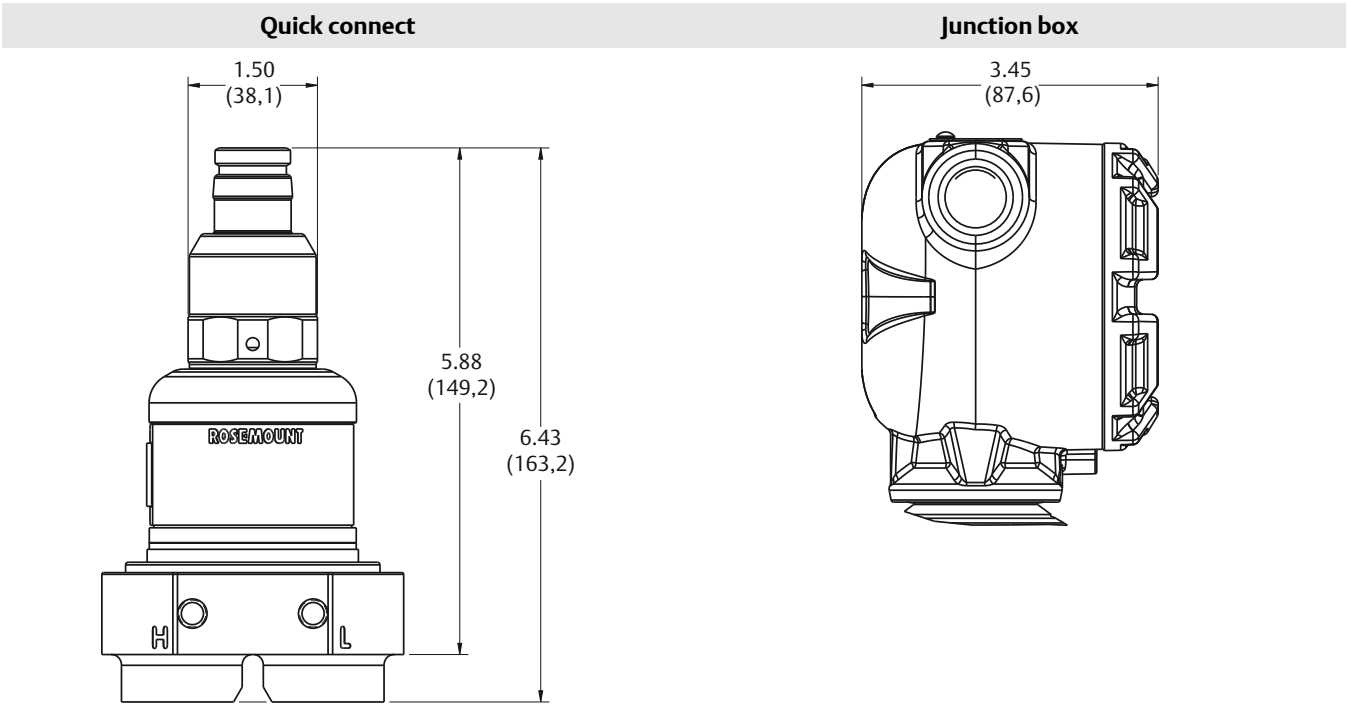
- A. Digital display cover
- B. Bracket mounting holes (5/16-18 UNC, two places)
- C. Housing rotation set screw
- D. Nameplate
- E. Digital display cover



Dimensions are in inches (millimeters).

A. Digital display cover

Figure 3: Other Housings



Quick connect**Junction box**

Dimensions are in inches (millimeters).

Figure 4: Remote Meter Option

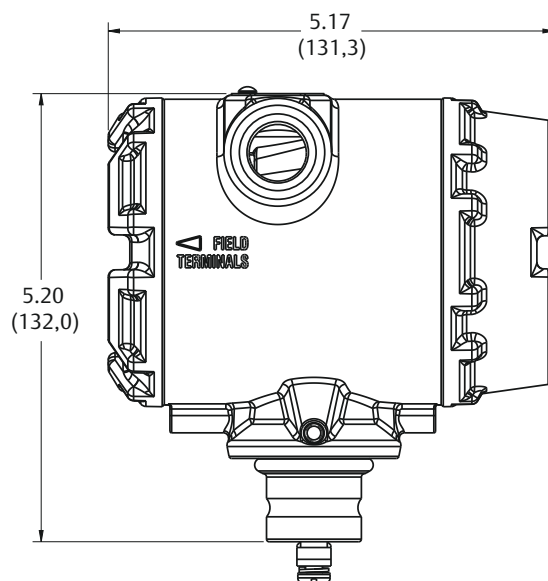
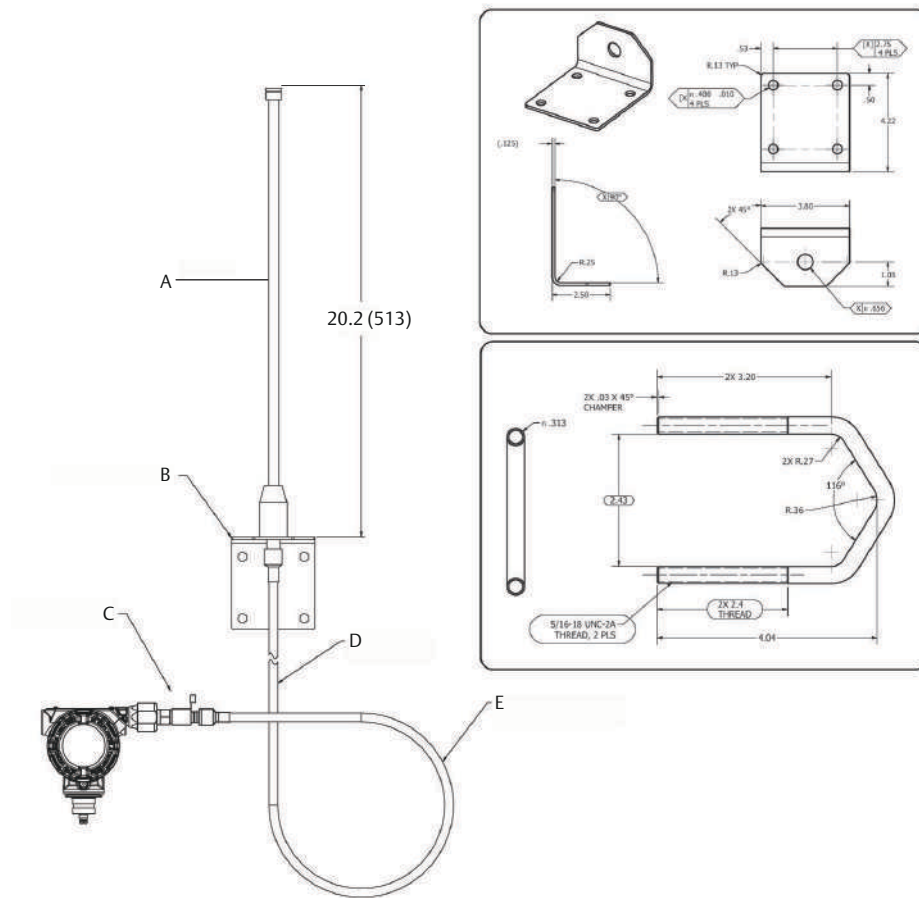


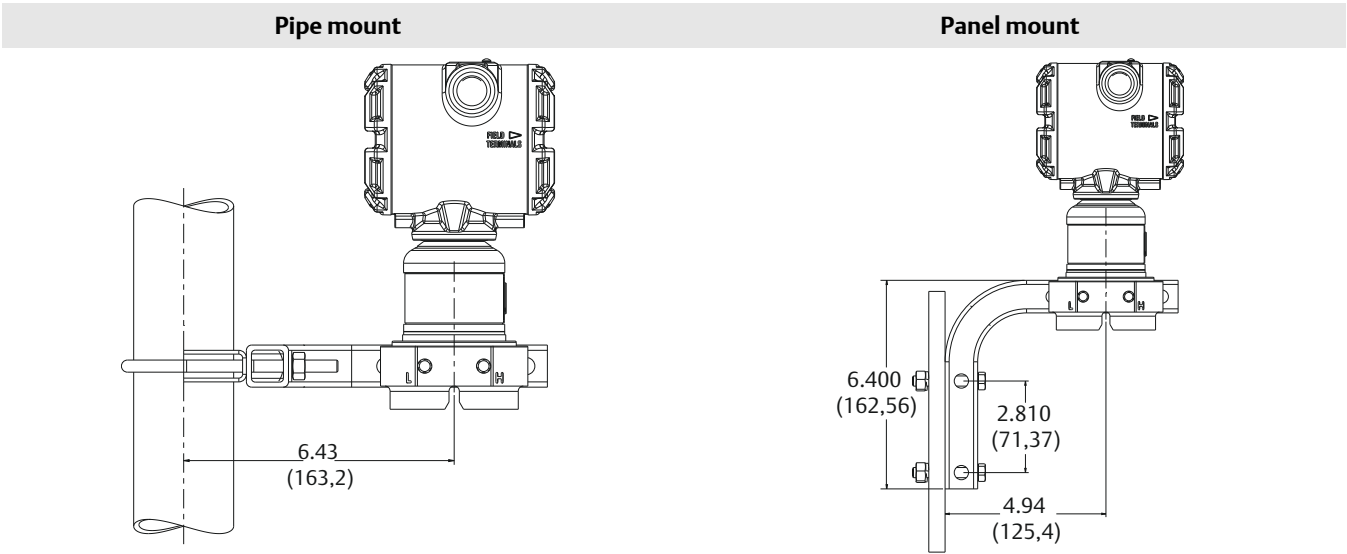
Figure 5: High Gain, Remote Mount Antenna (WN Option)



- A. Antenna
- B. Mounting bracket
- C. Lightning arrester
- D. 25 ft (7.6 m) cable
- E. Min drip loop Ø12-in. (0.3 m)

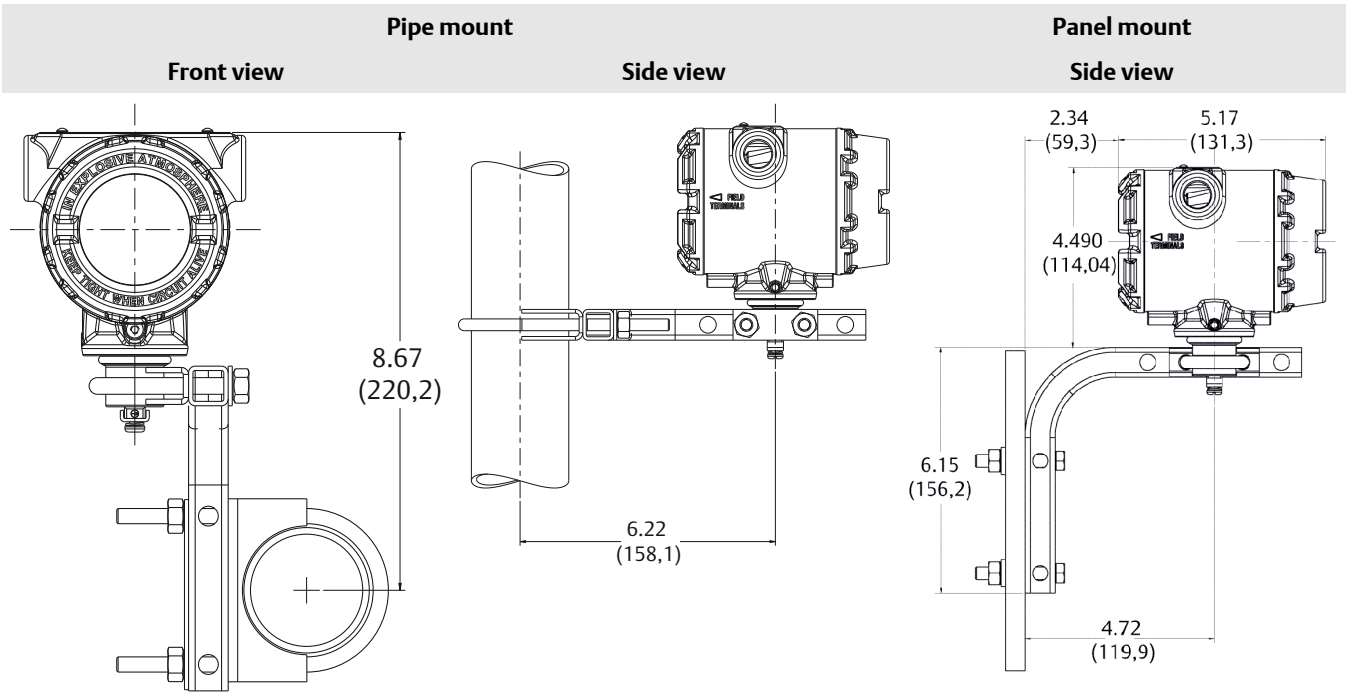
Dimensions are in inches (millimeters).

Figure 6: Traditional Mounting Configurations



Dimensions are in inches (millimeters).

Figure 7: Remote Display Mounting Configurations (B4 Bracket)



Dimensions are in inches (millimeters).

Options

Transmitter options

Standard configuration

Unless otherwise specified, transmitter is shipped as follows:

Engineering units	
Transmitter	inH ₂ O (Range 6 and 7) psi (Range 8)
4 mA ⁽¹⁾ :	0 (engineering units above)
20 mA ⁽¹⁾ :	Upper range limit
Output	Linear
External buttons	None
Drain/vent	Specified model code option
LCD display	None
Alarm ⁽¹⁾	High
Software tag	Blank
Damping	0.4 seconds ⁽²⁾

(1) Not applicable to FOUNDATION Fieldbus or wireless.

(2) For FOUNDATION Fieldbus protocols, default damping is one second.

Custom configuration⁽¹⁸⁾

If option code C1 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
- Wireless information
- Scaled variable
- and more

Refer to the Rosemount 3051S High Static Pressure Transmitter [Configuration Data Sheet](#) for more information.

Tagging (3 options available)

- Standard SST hardware tag is wired to the transmitter. Tag character height is 0.125-in. (3,18 mm), 56 characters maximum.
- Tag may be permanently stamped on transmitter nameplate upon request, 56 characters maximum.
- Tag may be stored in transmitter memory. Character limit is dependent on protocol.

(18) Not applicable to FOUNDATION Fieldbus protocol.

HART® 4-20mA protocol	8 characters
WirelessHART® protocol	32 characters
Foundation Fieldbus protocol	32 characters

Commissioning tag⁽¹⁹⁾

A temporary commissioning tag is attached to all transmitters. The tag indicates the device ID and allows an area for writing the location.

Output information

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

Pressure			
atm	inH ₂ O @4 °C	g/cm ²	psi
mbar	mmH ₂ O	kg/cm ²	torr
bar	mmHg	Pa	cmH ₂ O @4 °C ⁽¹⁾
inH ₂ O	mmH ₂ O @4 °C	kPa	mH ₂ O @4 °C ⁽¹⁾
inHg	ftH ₂ O	MPa	ftH ₂ O @60 °F ⁽¹⁾
hPa ⁽¹⁾	inH ₂ O @60 °F	kg/m ² ⁽¹⁾	cmHg @0 °C ⁽¹⁾
mHg @0 °C ⁽¹⁾	psf ⁽¹⁾	ftH ₂ O @4 °C ⁽¹⁾	

(1) Field configurable only, not available for factory calibration or custom configuration (option code C1 "Software configuration").

M5 digital display and interface options

- 3-line, 7-digit LCD display
- 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

Transmitter will ship with no buttons unless option D1 (hardware adjustments) or DA2 (Advanced HART Diagnostics Suite) are specified.

The transmitter is available with a digital zero button installed with or without the LCD display digital display.

Transient protection (option code T1)

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 μs)

6 kV crest (1.2 × 50 μs)

Conduit plug

DO 316 SST Conduit Plug Single 316 SST conduit plug replaces carbon steel plug

(19) Only applicable to FOUNDATION Fieldbus.

Bracket option

B4 Bracket for 2-in. pipe or panel mounting

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

Other publications

For additional information, go to www.Emerson.com.

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