Rosemount™ 3051HT Hygienic Pressure Transmitter

- Hygienic design conforms to 3-A® and EHEDG standards

- Reference accuracy of 0.065 percent with high performance option

- Demonstrated best-in-class performance during SIP/CIP for process temperatures up to 302 °F (150 °C)

- Rangeability of 100:1

- Unparalleled seven-year stability reduces calibration frequency

- 4–20 mA/HART®, PROFIBUS® PA or FOUNDATION™ Fieldbus output and AMS Suite: Intelligent Device Manager compatibility ensures easier configurations, calibrations, and operation

- Proven technology from Emerson improves process reliability and robustness

ROSEMOUNT™

EMERSON™

Features and benefits

Now you can have the best, most reliable performance… in a hygienic package

The Rosemount 3051HT Hygienic Pressure Transmitter brings best-in-class performance, application expertise, and operational and maintenance cost savings to the biotechnology, pharmaceuticals, and food and beverage industries.

Hygienic design conforms to hygienic standards

The hygienic design of the Rosemount 3051HT features 32 μ-in. Ra mechanically polished and 15 μ-in. Ra electropolished wetted surfaces. The stainless steel (SST) design is free of voids and crevices to ensure easy cleaning and wipe downs. The Rosemount 3051HT is also 3-A and EHEDG approved and is designed according to strict ASME BPE guidelines.

Demonstrated best-in-class performance during CIP/SIP processes

The Rosemount 3051HT was designed and thoroughly tested to ensure that it minimizes temperature induced errors and recovers rapidly and repeatably from CIP/SIP processes. This is called "batch to batch repeatability" and can reduce your downtime between cleaning cycles, enabling faster turnarounds and increased plant availability.

Proven Emerson technology improves process reliability and robustness

The Rosemount 3051HT uses the same proven sensor and electronics technology found in other industry leading Rosemount transmitters from Emerson. This ensures the transmitter to be robust and reliable, which improves your process consistency and increases your plant availability.

Unparalleled stability reduces calibration frequency

Competitor devices can drift out of specification in just a few months and require re-calibration, consuming your time and money while risking regulatory non-compliance. The Rosemount 3051HT provides better stability so you can confidently extend calibration frequencies to reduce maintenance costs.

Contents

4–20 mA/HART, PROFIBUS PA, or FOUNDATION Fieldbus output and AMS Suite compatibility ensures easier configurations, calibrations and operation

Lower maintenance costs with AMS Suite software, improve device performance and enable easier configuration and setup. Combining AMS Suite with the Rosemount 3051HT can also provide you with advanced functionality including predictive diagnostics and audit trail information to make FDA compliance simpler and paper free.

Access information when you need it with asset tags

Newly shipped devices include a unique QR code asset tag that enables you to access serialized information directly from the device. With this capability, you can:

- Access device drawings, diagrams, technical documentation, and troubleshooting information in your MyEmerson account
- Improve mean time to repair and maintain efficiency
- Ensure confidence that you have located the correct device
- Eliminate the time-consuming process of locating and transcribing nameplates to view asset information

Rosemount 3051HT Hygienic Pressure Transmitter ordering information

- 4-20 mA HART, FOUNDATION Fieldbus

- Measurement range Up to 300 psig (20,7 bar) gage, up to 150 psia (10,3 bar) Absolute

- Process wetted material 316L SST mechanically polished and electropolished to Ra < 15 μ-in. (0.38 μ-m)

- Basic diagnostics, loop integrity

- 3A, EHEDG, ASME-BPE, see full specs for complete list of certifications

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.

Required model components

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.

Rosemount model

Code	Description	
3051HT	Hygienic Pressure Transmitter	★

Pressure type

Code	Description	
G	Gage	★
A	Absolute	★

Performance class

Code	Range 1–2	Range 3	Range 0	
A	0.065 % span accuracy and 7-year stability	0.065 % span accuracy and 5-year stability	0.065 % span accuracy and 1- year stability	★
B	0.075 % span accuracy and 5-year stability	0.075 % span accuracy and 3-year stability	0.075 % span accuracy and 1- year stability	★

Pressure range

Code	Rosemount 3051HTG[1]	Rosemount 3051HTA	
0	–5 to 5 psi (–0.34 to 0.34 bar-g)	N/A	★
1	–14.7 to 30 psi (–1.01 to 2.1 bar-g)	0 to 30 psia (0 to 2.1 bar-a)	★
2	–14.7 to 150 psi (–1.01 to 10.3 bar-g)	0 to 150 psia (0 to 10.3 bar-a)	★
3	–14.7 to 800 psi (–1.01 to 55.2 bar-g)	N/A	★

(1)   *Rosemount 3051HTG lower range limit varies with atmospheric pressure.*

Transmitter output

Code	Description	
A	4–20 mA with digital signal based on HART Protocol	★
F	FOUNDATION Fieldbus Protocol	★
W	PROFIBUS PA Protocol	★

Sensor fill fluid

Code	Description	
3	Neobee® M-20	★

Housing material

Housing material option 1 comes with polycarbonate cover standard. Housing material option 2 comes with Al and glass cover standard.

Code	Description	
1	Crevice-free polished 316 SST	★

Code	Description	
2	Aluminum	★

Conduit entry size

Code	Description	
A	½–14 NPT	★
B	M20 x 1.5	★

Process connection style

All process wetted parts have surface finish of Ra < 32 μ-in (0.81 μ-m) standard unless otherwise specified.

Code	Type	Size	Diaphragm	Upper housing/extension	
T32	Tri Clamp	1 ½-in.	316L SST	316L SST	★
T42	Tri Clamp	2-in.	316L SST	316L SST	★
D32	DIN 11851 with Coupling Nut	DN40	316L SST	316L SST	★
D42	DIN 11851 with Coupling Nut	DN50	316L SST	316L SST	★
V22	Varivent Type F	DN25	316L SST	316L SST	★
V32	Varivent Type N	DN40	316L SST	316L SST	★
B11	Assemble to one Rosemount 1199 Diaphragm Seal with SST transmitter flange Product Data Sheet				★

Additional options

Extended product warranty

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

Plantweb control functionality

Code	Description	
A01	FOUNDATION Fieldbus advanced control function block suite	★

Plantweb diagnostics functionality

Code	Description	
DA0[1]	Power advisory HART diagnostic	★
D01	FOUNDATION Fieldbus diagnostics suite	★

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

Product certificates

Code	Description	
I1	ATEX intrinsic safety	★
I2	INMETRO Intrinsic Safety	★
I5	USA intrinsic safety and non incendive	★
I6	Canada intrinsic safety	★
I7	IECEx intrinsic safety	★

Display and interface options

Code	Description	
M4[1]	LCD display with LOI	★
M5	LCD display	★

(1) *Only available with HART 4—20mA output (code A) and PROFIBUS PA (code W).*

Configuration buttons

Only available with HART 4—20 mA output (code A) and PROFIBUS PA (code W).

Code	Description	
D4	Analog zero and span	★
DZ	Digital zero trim	★

Wetted surface finish

Meets ASME BPE surface designation SF4.

Code	Description	
F2	Mechanically polished and electropolished to Ra < 15 μ-in. (0.38 μ-m)	★

Transient terminal block

Code	Description	
T1	Transient protection terminal block	★

Software configuration

Only available with HART 4—20 mA output (code A) and PROFIBUS PA (code W).

CDS required with order, available with output code A only.

Code	Description	
C1	Custom software configuration	★

Alarm levels

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

Code	Description	
C4	NAMUR alarm and saturation levels, high alarm	★
CN	NAMUR alarm and saturation levels, low alarm	★
CR	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	★
C7	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	★
CT	Low alarm (standard Rosemount alarm and saturation levels)	★

Special cleaning

Code	Description	
P2	Cleaning for special services	
P3	Cleaning for <1 PPM chlorine/fluorine	

Wetted surface finish certification

Code	Description	
Q16	Surface finish certification	★

Calibration certification

Code	Description	
Q4	Calibration certificate	★
QP	Calibration certificate and tamper evident seal	★

Material traceability certification

Code	Description	
Q8	Material traceability certification per EN 10204 3.1	★

Positive material identification (PMI)

Code	Description	
Q76	PMI verification and certificate	★

Certificate of compliance to 3-A

Code	Description	
QA	Certificate of compliance to 3-A	★

Certificate of compliance to ASME BPE

Available only with wetted surface finish option F2.

Code	Description	
QB	Certificate of compliance to ASME BPE	★

Certifiate of compliance to EHEDG

Code	Description	
QE	Certification of compliance to EHEDG	★

Conduit electrical connector

Code	Description	
GE	M12, 4-pin, male connector (eurofast®)	★
GM	A size mini, 4-pin, male connector (minifast®)	★

Increased ingress protection

Code	Description	
V9	Transmitter IP69K Rating (SST only)	★

Specifications

Performance specifications

For zero-based spans, reference conditions, Neobee® M-20 oil fill, SST materials, 1½ -in. tri-clamp process connections, silicone gasket material, clamping torque of 45 in-lb, digital trim values set to equal range points.

For assemblies attached to a Rosemount 1199 Diaphragm Seal (option code B11), use Instrument Toolkit™ or the QZ option to quantify the total performance of the assembly under operating conditions.

Note
QZ option is to be added to the Rosemount 1199 model string.

Table 1: Reference Accuracy

Stated reference accuracy equations include terminal based linearity, hysteresis, and repeatability.

Range	Performance class option A	Performance class option B
0	±0.065% of span For spans less than 5:1, accuracy = $\pm\left(0.013\left[\dfrac{URL}{Span}\right] + 0.01\right)$% of span	±0.075% of span For spans less than 5:1, accuracy = $\pm\left(0.016\left[\dfrac{URL}{Span}\right] + 0.005\right)$% of span
1	±0.065% of span For spans less than 5:1, accuracy = $\pm\left(0.009\left[\dfrac{URL}{Span}\right] + 0.02\right)$% of span	±0.075% of span For spans less than 5:1, accuracy = $\pm\left(0.01\left[\dfrac{URL}{Span}\right] + 0.025\right)$% of span
2	±0.065% of span For spans less than 10:1, accuracy = $\pm\left(0.0075\left[\dfrac{URL}{Span}\right]\right)$% of span	±0.075% of span For spans less than 10:1, accuracy = $\pm\left(0.009\left[\dfrac{URL}{Span}\right]\right)$% of span
3	±0.065% of span For spans less than 10:1, accuracy = $\pm\left(0.021\left[\dfrac{URL}{Span}\right] + 0.045\right)$% of span	±0.075% of span For spans less than 10:1, accuracy = $\pm\left(0.025\left[\dfrac{URL}{Span}\right] + 0.05\right)$% of span

Table 2: Long Term Stability

±50 °F (28 °C) temperature changes, and up to 300 psi (20,68 bar) line pressure

Range	Performance class option A	Performance class option B
0	±0.2% of URL for 1-year	±0.2% of URL for 1-year
1–2	±0.15% of URL for 7-years	±0.15% of URL for 5-years
3	±0.2% of URL for 5-years	±0.2% of URL for 3-years

Table 3: Dynamic Performance

	4–20 mA HART[1]	FOUNDATION Fieldbus and PROFIBUS PA Protocols[2]	Typical HART transmitter response time
Total response time (T_d+T_c)[3]:			
Ranges 0–3	145 ms	197 ms	
Dead time (T_d)	60 ms (nominal)	112 ms	
Update rate	22 times per second	22 times per second (FOUNDATION Fieldbus) 20 times per second (PROFIBUS PA)	

Transmitter output vs. time

Pressure released

T_d = Dead time
T_c = Time constant

Response time = T_d+ T_c

63.2 percent of total step change

(1) *Dead time and update rate apply to all models and ranges; analog output only.*
(2) *Transducer Block response time, Analog Input block execution time not included.*
(3) *Nominal total response time at 75 °F (24 °C) reference conditions.*

Table 4: Ambient Temperature Effect per 50 °F (28 °C)

Range	Ambient temperature effect
0	±(0.35% URL + 0.20% span)
1	±(0.10% URL + 0.20% span)
2	±(0.05% URL + 0.075% span)
3	±(0.10% URL + 0.075% span)

For assemblies attached to a Rosemount 1199 Diaphragm Seal (option code B11) see Instrument Toolkit.

Table 5: Batch to Batch Repeatability

One batch is an exposure to steam in place (SIP) with a process temperature of 284 °F (140 °C) for four hours.

Note
Does not apply to assemblies attached to a Rosemount 1199 Diaphragm Seal (option code B11).

Range	Batch to batch repeatability
0	±0.20% URL for 60 batches (0.010 psi, 0.89 mbar)
1	±0.05% URL for 60 batches (0.015 psi, 1.03 mbar)
2	±0.02% URL for 60 batches (0.030 psi, 2.07 mbar)
3	±0.065% URL for 60 batches (0.195 psi, 13.44 mbar)

Mounting position effects

Zero shifts to ±2.5 inH$_2$O (6.22 mbar), which can be calibrated out. No span effect.

Vibration effect

Less than ±0.1% of URL when tested per the requirements of IEC 60770 control room level.

Electromagnetic compatibility (EMC)

Note
During surge event, device with 4-20mA (Transmitter output option code A) 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, device with FOUNDATION Fieldbus or PROFIBUS (Transmitter output option code F or W) may exceed maximum EMC deviation limit, however, device will self-recover and return to normal operation within specified start-up time.

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 x 20 μs)

6 kV crest (1.2 x 50 μs)

Functional specifications

Table 6: Range and Sensor Limits

Range	Minimum span	URL	LRL	
			3051HTA	**3051HTG**[1]
0	0.50 psi (0.034 bar)	5.00 psi (0.34 bar)	N/A	−5.00 psig (−0.34 bar)
1	1.00 psi (0.069 bar)	30.00 psi (2.07 bar)	0 psia (0 bar)	−14.70 psig (−1.01 bar)
2	1.50 psi (0.10 bar)	150.00 psi (10.34 bar)		
3	8.00 psi (0.55 bar)	800.00 psi (55.16 bar)	N/A	

(1) *Assumes atmospheric pressure of 14.70 psia (1.01 bar-a).*

Service

Liquid, gas, and vapor applications

4–20 mA HART (output code A)

Power supply

External power supply required. Standard transmitter (4–20 mA) operates on 10.5–42.4 Vdc with no load.

Load limitations

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

Max. loop resistance = 43.5 (Power Supply voltage – 10.5)
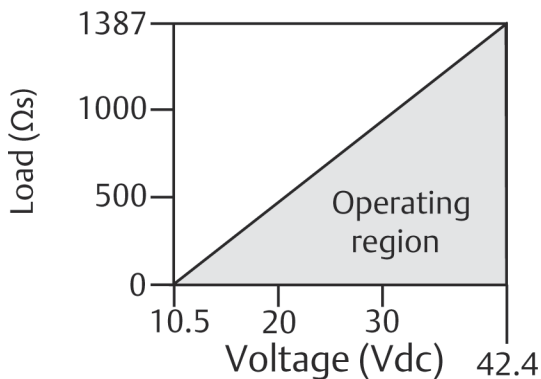
Communication requires a minimum loop resistance of 250 ohms.

Note
For CSA approval, power supply must not exceed 42.4 V.

Indication

Optional two-line LOI/LCD display

Optional configuration buttons

Configuration buttons need to be specified:

- Digital zero trim (option code DZ) changes digital value of the transmitter and is used for performing a sensor zero trim

- Analog zero span (option code D4) changes analog value and can be used to rerange the transmitter with an applied pressure

Output

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

The Rosemount 3051 comes with Selectable HART Revisions. Digital communications based on HART Revision 5 (default) or Revision 7 (option code HR7) protocol can be selected. The HART revision can be switched in the field using any HART based configuration tool or the optional local operator interface (M4).

Power advisory diagnostics

Power advisory diagnostics pro-actively detect and notify 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.

Local Operator Interface (LOI)

The LOI utilizes a two-button menu with internal and external/terminal side 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). See Rosemount 3051 Reference Manual for LOI configuration menu.

FOUNDATION Fieldbus (output code F)

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)

Indication

Optional two-line LCD display

FOUNDATION Fieldbus block execution times

Block	Execution time
Resource	N/A
Sensor and SPM Transducer	N/A
LCD Display	N/A
Analog Input 1, 2	20 milliseconds
PID	25 milliseconds
Input Selector	20 milliseconds
Arithmetic	20 milliseconds
Signal Characterizer	20 milliseconds
Integrator	20 milliseconds
Output Splitter	20 milliseconds
Control Selector	20 milliseconds

FOUNDATION Fieldbus parameters

Links	25 (max.)
Virtual Communications Relationships (VCR)	20 (max.)

FOUNDATION Fieldbus function blocks (option A01)

Resource block

The resource block contains diagnostic, hardware, and electronics information. There are no linkable inputs or outputs to the resource block.

Sensor transducer block

The sensor transducer block contains sensor information and the ability to calibrate the pressure sensor or recall factory calibration.

LCD transducer block

The LCD transducer block is used to configure the LCD display meter.

Analog input (AI) block

The analog input Function Block processes the measurements from the sensor and makes them available to other function blocks. The output value from the AI Block is in engineering units and contains a status indicating the quality of the measurement. The AI Block is widely used for scaling functionality.

Input selector (ISEL) block

The Input Selector Function Block can be used to select the first good, hot backup, maximum, minimum, or average of as many as eight input values and place it at the output. The block supports signal status propagation.

Integrator (INT) block

The Integrator Function Block integrates one or two variables over time. The block compares the integrated or accumulated value to pre-trip and trip limits and generates discrete output signals when the limits are reached.

The INT function block is used as a totalizer. This block will accept up to two inputs, has six options how to totalize the inputs, and two trip outputs.

Arithmetic (ARTH) block

The Arithmetic Function Block provides the ability to configure a range extension function for a primary input. It can also be used to compute nine different arithmetic functions including flow with partial density compensation, electronic remote seals, hydrostatic tank gaging, ratio control, and others.

Signal characterizer (SGCR) block

The Signal Characterizer Function Block characterizes or approximates any function that defines an input/output relationship. The function is defined by configuring as many as twenty X,Y coordinates. The block interpolates an output value for a given input value using the curve defined by the configured coordinates. Two separate analog input signals can be processed simultaneously to give two corresponding separate output values using the same defined curve.

Proportional/Integral/Derivative (PID) block

The PID Function Block combines all of the necessary logic to perform PID control. The block supports mode control, signal scaling, and limiting, feed forward control, override tracking, alarm limit detection, and signal status propagation.

Control selector block

The Control Selector Function Block selects one of two or three inputs to be the output. The inputs are normally connected to the outputs of PID or other function blocks. One of the inputs would be considered normal and the other two overrides.

Output splitter block

The Output Splitter Function Block provides the capability to drive two control outputs from a single input. It takes the output of one PID or other control block to control two valves or other actuators.

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.

FOUNDATION Fieldbus diagnostics suite (option code D01)

The Rosemount 3051HT FOUNDATION Fieldbus diagnostics suite features SPM technology to detect changes in the process, process equipment, or installation conditions (such as plugged impulse lines) of the transmitter. This is done by modeling the process noise signature (using the statistical values of mean and standard deviation) under normal conditions and then comparing the baseline values to current values over time. If a significant change in the current values is detected, the transmitter can generate an alert.

Sensor overpressure limits

- Range 0: 60 psi (4.14 bar)

- Range 1: 150 psi (10.34 bar)

- Range 2: 300 psi (20.68 bar)

- Range 3: 1600 psi (110.32 bar)

Note
Overpressure limit is dependent on the clamp/pressure adapter or sensor rating (whichever is lower).

Sensor burst pressure

All ranges: 900 psi (62.05 bar)

Note
Burst Pressure limit is dependent on the clamp/pressure adapter or sensor rating (whichever is lower).

Temperature limits

Ambient

5 °F (-15 °C) to 185 °F (85 °C)

175 °F with LCD display

Storage

-4 °F (-20 °C) to 230 °F(110 °C)

Process temperature limits

5 °F (-15 °C) to 302 °F (150 °C)[1]

Process temperatures above 185 °F (85 °C) require lowering the ambient limits by a 1.5:1 ratio:

Max. ambient temperature in °F = 185 — $\dfrac{(ProcessTemp - 185)}{1.5}$

Max. ambient temperature in °C = 85 — $\dfrac{(ProcessTemp - 85)}{1.5}$

For assemblies attached to a Rosemount 1199 Diaphragm Seal (option code B11), see Rosemount 1199 Seal Systems Product Data Sheet for process temperature limits.

Turn-on time

Performance within specifications less than two seconds (seven seconds for PROFIBUS PA and 20 seconds for FOUNDATION Fieldbus) after power is applied to the transmitter.

PROFIBUS PA Protocol (output code W)

Profile version

3.02

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)

Output update rate

Twenty times per second

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(1) For Option codes T32, T42: 212F (100C) limit for pressure below 3.9 psia. For Option codes D32, D42, V22, V32: 23C limit for pressures below 3.9 psia; 60C limit for pressures from 3.9 psia to 6 psia

Standard function blocks

Analog input (AI block)

The AI function block processes the measurements and makes them available to the host device. The output value from the AI block is in engineering units and contains a status indicating the quality of the measurement.

Physical block

The physical block defines the physical resources of the device including type of memory, 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.

Indication

Optional 2-line LCD display

LOI

The LOI utilizes a 2-button menu with internal and external configuration buttons.

Damping

4–20 mA HART Protocol

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

FOUNDATION Fieldbus Protocol

Transducer block: User-configurable

AI block: User-configurable

PROFIBUS PA Protocol

AI block only: User-configurable

Failure mode alarm

HART 4–20 mA Protocol (output code A)

If self-diagnostics detect a sensor or microprocessor failure, the analog signal is driven either high or low to alert the user. High or low failure mode is user-selectable with a jumper/switch on the transmitter. The values to which the transmitter drives its output in failure mode depend on whether it is configured to standard, NAMUR-compliant, or custom levels (see Table 7 below). The values for each are as follows:

Table 7: Alarm Configuration

	High alarm	Low alarm
Default	≥ 21.75 mA	≤ 3.75 mA
NAMUR compliant[1]	≥ 22.5 mA	≤ 3.6 mA
Custom levels[1]	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.*

FOUNDATION Fieldbus Protocol (output code F) and PROFIBUS PA Protocol (output code W)

If self-diagnostics detect a gross transmitter failure, that information gets passed as an alert and a status along with the process variable.

Humidity limits

0–100 percent relative humidity

Physical specifications

Material selection

Emerson provides a variety of Rosemount products 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.

Process connections

- 1½ -in. Tri Clamp
- 2 -in. Tri Clamp
- DIN 11851 DN40
- DIN 11851 DN50
- Varivent Type F DN25
- Varivent Type N DN40

Process-wetted parts

Isolation diaphragm

316L SST

Process connector

316L SST

Surface finish

- R_a < 32 μ-in. (0.81 μ-m) mechanically polished (standard on all connections)

Transmissible Spongiform Encephalopathy (TSE) Declaration

Emerson certifies no process wetted components used in this product contain substances of animal origin. Materials used in the production or processing of wetted components for this product meet the requirements stated in EMA/410/01 Rev. 3 and ISO 22442-1:2015. Wetted components in this product are considered free of TSE.

Non-wetted parts

Electronics housing

316 SST or low-copper aluminum

Enclosures meet NEMA® Type 4x, IP66, IP68, and IP69K when properly installed.

Note
IP69K rating only available on units with a SST housing and option code V9 in the model string.

LOI and LCD display covers

■ Non-glass, polycarbonate LCD display cover with SST housing material (option 1)

■ Low-copper aluminum and glass LCD display cover with low-copper aluminum housing material (option 2)

Sensor module fill fluid

Neobee M-20 (FDA approved)

Shipping weight for Rosemount 3051HT

3.44 lb (1.56 kg) with SST housing, LCD display with polycarbonate cover, and 1 ½-in. tri-clamp connection

Product certifications

Rev 1.6

European Directive Information

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

Ordinary Location Certification

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

Altitude	Pollution degree
5000 m max	4 (metallic enclosure)
	2 (non-metallic enclosure)

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

I5 Intrinsic Safety; Nonincendive

Certificate: 1053834

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 when connected per Rosemount drawing 03031-1024, CL I ZONE 0 AEx ia IIC T4; NI CL 1, DIV 2, GP A, B, C, D T5; T4(−20 °C ≤ T_a ≤ +70 °C) [HART]; T4(−20 °C ≤ T_a≤ +60 °C) [FOUNDATION Fieldbus]; Type 4x

Canada

I6 Intrinsic Safety

Certificate: 1053834

Standards: ANSI/ISA 12.27.01-2003, CSA Std. C22.2 No.142-M1987, CSA Std. C22.2. No.157-92, CSA Std. C22.2 No. 213 - M1987

Markings: Intrinsically Safe Class I, Division 1 Groups A, B, C, D when connected in accordance with Rosemount drawing 03031-1024, Temperature Code T4; Suitable for Class I, Zone 0; Type 4X; Factory Sealed; Single Seal (see drawing 03031-1053)

Europe

I1 ATEX Intrinsic Safety

Certificate: BAS97ATEX1089X

Standards: EN 60079-0:2012 + A11:2013, EN 60079-11:2012

Markings: HART: II 1 G Ex ia IIC T5/T4 Ga, T5(–20 °C≤ T_a ≤ +40 °C), T4(–20 °C ≤ T_a ≤ +70 °C) Fieldbus: Ex II 1 G Ex ia IIC Ga T4(–20 °C ≤ T_a ≤ +60 °C)

	HART	FOUNDATION Fieldbus and PROFIBUS PA
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	0.9 W	1.3 W
Capacitance C_i	0.012 µF	0 µF
Inductance L_i	0 mH	0 mH

Special Conditions for Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V insulation test required by clause 6.3.12 of EN60079-11:2012. 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 Zone 0.

International

I7 IECEx Intrinsic Safety

Certificate: IECEx BAS 09.0076X

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

Markings: HART: Ex ia IIC T5/T4 Ga, T5(–20 °C ≤ T_a ≤ +40 °C), T4(–20 °C ≤ T_a ≤ +70 °C) Fieldbus: Ex II 1 G Ex ia IIC Ga T4(–20 °C ≤ T_a ≤ +60 °C)

	HART	PROFIBUS
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	0.9 W	1.3 W
Capacitance C_i	0.012 µF	0 µF
Inductance L_i	0 mH	0 mH

Special Conditions for Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V insulation test required by clause 6.3.12 of EN60079-11:2012. 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 Zone 0.

Brazil

I2 INMETRO Intrinsic Safety

Certificate: UL-BR 13.0584X

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

Markings: HART®: Ex ia IIC T5/T4 Ga, T5(−20 °C ≤ T_a ≤ +40 °C), T4(−20 °C ≤ Ta ≤ +70 °C) Fieldbus: Ex ia IIC T4 Ga (−20 °C ≤ T_a ≤ +60 °C)

	HART	PROFIBUS®
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	0.9 W	1.3 W
Capacitance C_i	0.012 μF	0 μF
Inductance L_i	0 mH	0 mH

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by ABNT NBR IRC 60079-11. This must be taken into account when installing the equipment.

2. The enclosure may be made of aluminum alloy and given protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if equipment requires EPL Ga.

Additional certifications

3-A

All Rosemount 3051HT transmitters with the following connections are 3-A approved and labeled:

T32:	1½-in. Tri Clamp
T42:	2-in. Tri Clamp
D32:	DIN 11851 DN40
D42:	DIN 11851 DN50
V22:	Varivent Type F DN25
V32:	Varivent Type N DN40

If process connection B11 is selected, please reference the ordering table of the Rosemount 1199 Diaphragm Seal Product Data Sheet for availability of 3-A certifications.

A 3-A certificate of compliance is available by selecting option code QA.

EHEDG

All Rosemount 3051HT Transmitters with polished SST housings (housing material option1) are EHEDG approved and labeled. A certificate of compliance is also available (option QE).

T32:	1½-in. Tri Clamp
T42:	2-in. Tri Clamp
D32:	DIN 11851 DN40

D42:	DIN 11851 DN50
V22:	Varivent Type F DN25
V32:	Varivent Type N DN40

If process connection B11 is selected, please reference the ordering table of the Rosemount 1199 Diaphragm Seal Product Data Sheet for availability of EHEDG certifications.

An EHEDG certificate of compliance is available by selecting option code QE.

Ensure gasket selected for installation is approved to meet both application and EHEDG certification requirements.

ASME-BPE

All Rosemount 3051HT Transmitters with option F2 and the following connections are designed to ASME-BPE SF4 standards:

T32:	1½-in. Tri Clamp
T42:	2-in. Tri Clamp
D32:	DIN 11851 DN40
D42:	DIN 11851 DN50
V22:	Varivent Type F DN25
V32:	Varivent Type N DN40

A self-certified certificate of compliance to ASME-BPE is also available (option QB).

Note
Per clause SD-2.4.4.2 (m), suitability of painted aluminum housings to be determined by end user.

Dimensional drawings

Rosemount 3051HT

For Rosemount 3051HT with Tri-Clamp Connection type and Absolute measurement or Range 0 or Range 1 Gauge measurement.

Figure 2: Rosemount 3051HT Pressure Transmitter with Aluminum Housing and Hygienic Clamp Connection

**Shown with optional digital display**   **Shown without digital display**
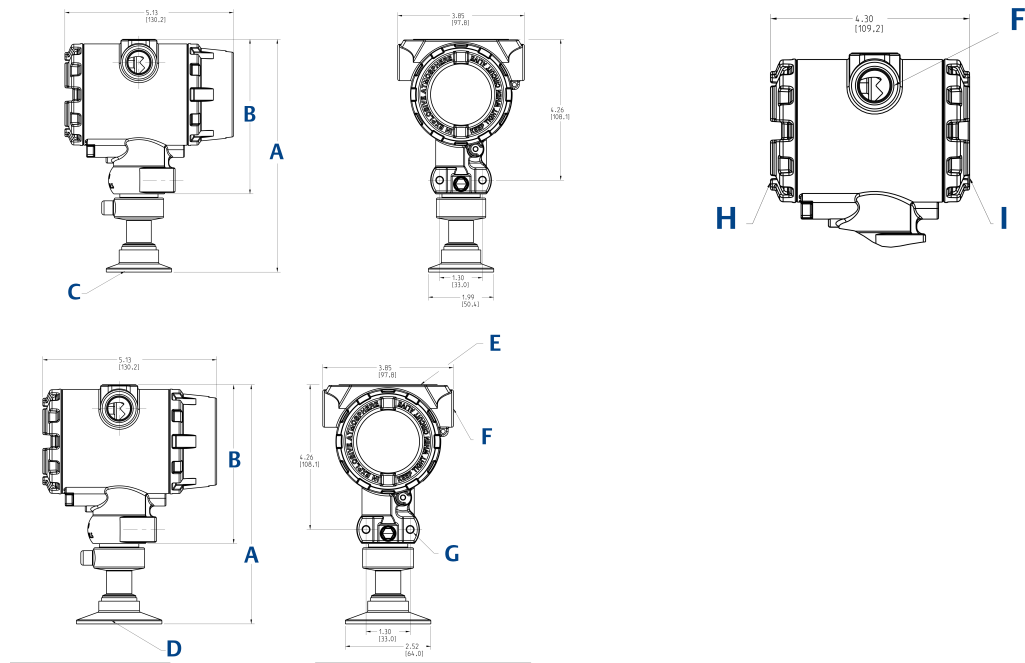
A. See table below
B. See table below
C. 1.5-in. hygienic clamp connection
D. 2-in hygienic clamp connection
E. Nameplate
F. Conduit connection (2 places)
G. Bracket mounting holes (¼-20 UNC)(2 places)
H. Field terminal
I. Transmitter electronics

Pressure range	DIM A (Aluminum)	DIM A (Stainless steel)	DIM B (Aluminum)	DIM B (Stainless Steel)
GP 0.1/AP 1.2	5.68 (144.3)	5.36 (136.1)	4.67 (118.6)	4.44 (112.8)
GP 2.3	7.01 (178)	6.75 (171.5)	4.67 (118.6)	4.44 (112.8)

Figure 3: Rosemount 3051HT Pressure Transmitter with SST Housing and Hygienic Clamp Connection

Shown with optional digital display

Shown without digital display
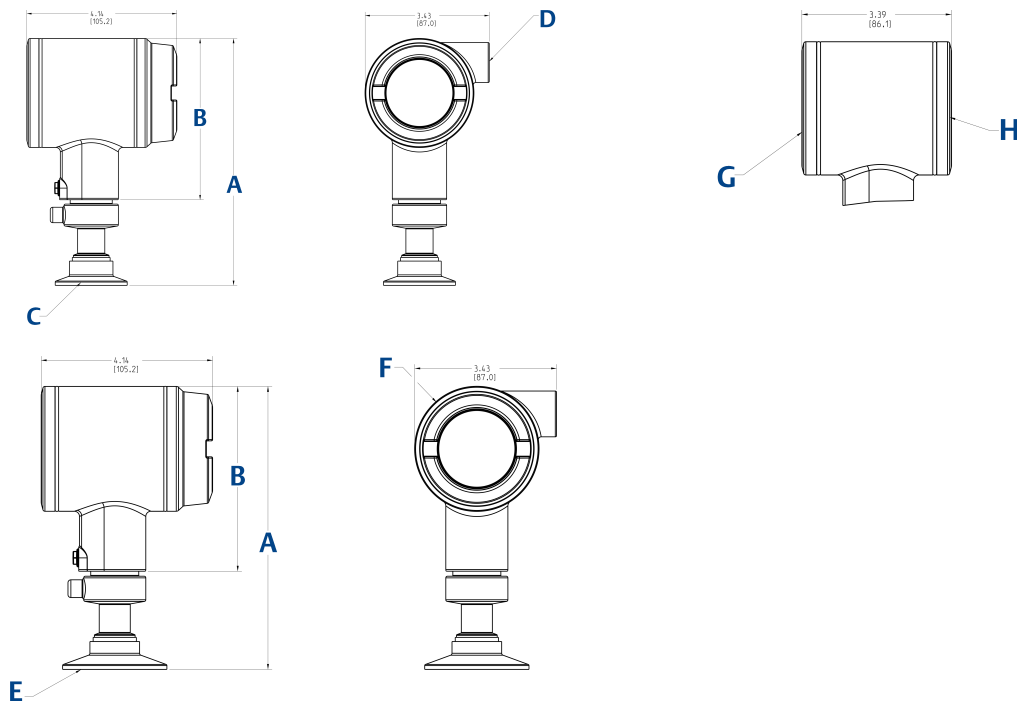
A. See table below
B. See table below
C. 1.5-in. hygienic clamp connection
D. Conduit connection
E. 2-in hygienic clamp connection
F. Nameplate and certification information
G. Field terminal
H. Transmitter electronics

Pressure range	DIM A (Aluminum)	DIM A (Stainless steel)	DIM B (Aluminum)	DIM B (Stainless Steel)
GP 0.1/AP 1.2	5.68 (144.3)	5.36 (136.1)	4.67 (118.6)	4.44 (112.8)
GP 2.3	7.01 (178)	6.75 (171.5)	4.67 (118.6)	4.44 (112.8)

Figure 4: Rosemount 3051HT Pressure Transmitter with Aluminum Housing and Hygienic Connection (DIN 11851 DN 40)

**Shown with optional digital display**

Shown without digital display

D

E

F
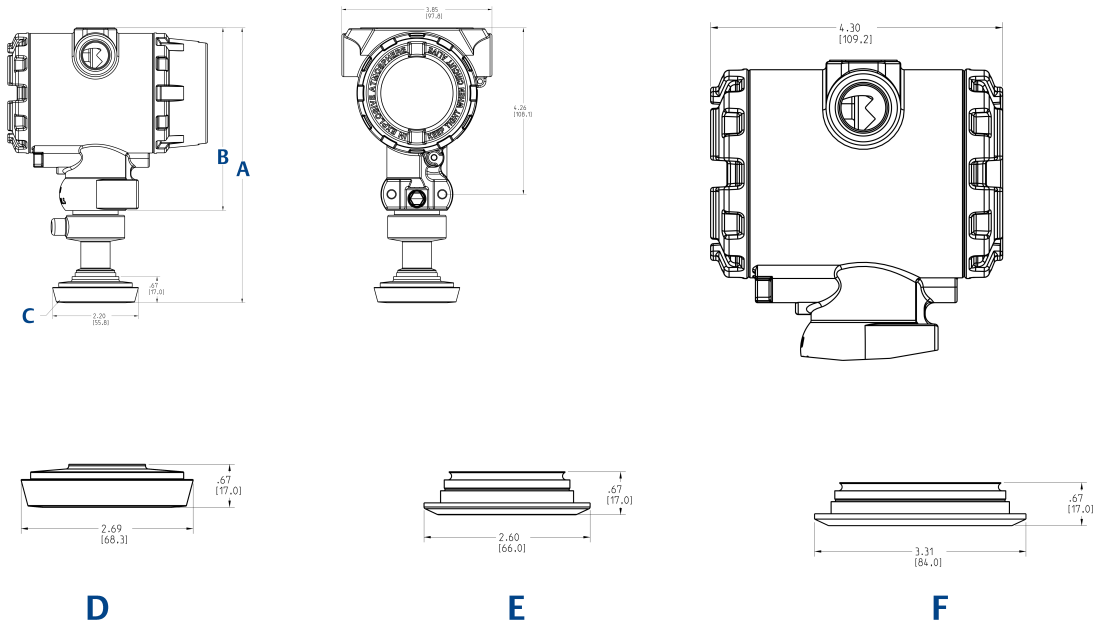
A. *See table below*
B. *See table below*
C. *DIN 11851 DN 40 connection*
D. *DIN 11851 DN 50*
E. *Varivent F*
F. *Varivent N*

Pressure range	DIM A (Aluminum)	DIM A (Stainless steel)	DIM B (Aluminum)	DIM B (Stainless Steel)
GP 0.1/AP 1.2	5.68 (144.3)	5.36 (136.1)	4.67 (118.6)	4.44 (112.8)
GP 2.3	7.01 (178)	6.75 (171.5)	4.67 (118.6)	4.44 (112.8)

Figure 5: Rosemount 3051HT Pressure Transmitter with SST Housing and Hygienic Clamp Connection (DIN 11851 DN 40)

Shown with optional digital display

Shown without digital display
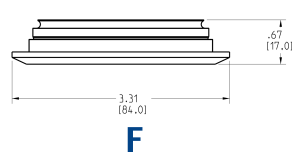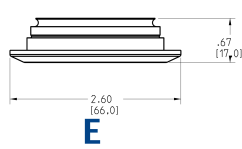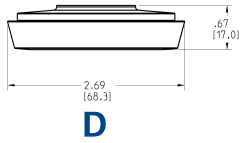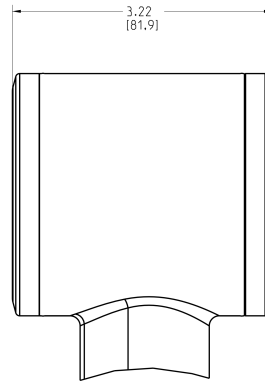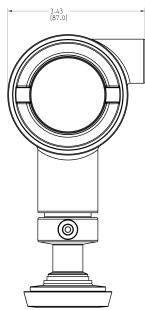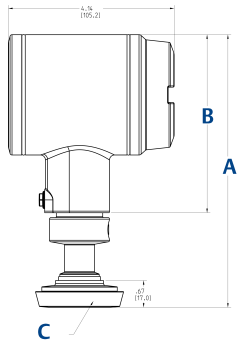
A. *See table below*
B. *See table below*
C. *DIN 11851 DN 40 connection*
D. *DIN 11851 DN 50*
E. *Varivent F*
F. *Varivent N*

Pressure range	DIM A (Aluminum)	DIM A (Stainless steel)	DIM B (Aluminum)	DIM B (Stainless Steel)
GP 0.1/AP 1.2	5.68 (144.3)	5.36 (136.1)	4.67 (118.6)	4.44 (112.8)
GP 2.3	7.01 (178)	6.75 (171.5)	4.67 (118.6)	4.44 (112.8)

Pipe mounting
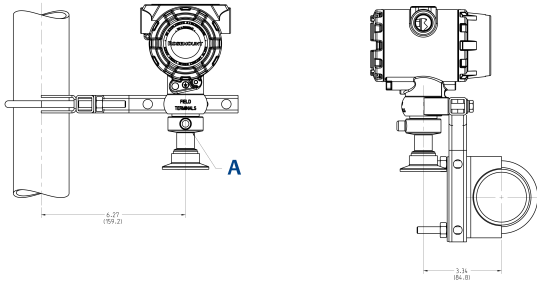
Panel mounting
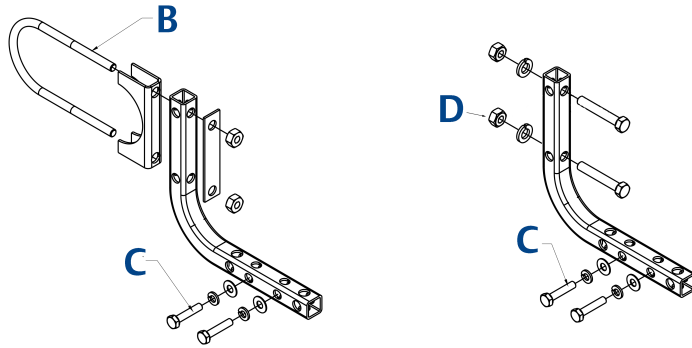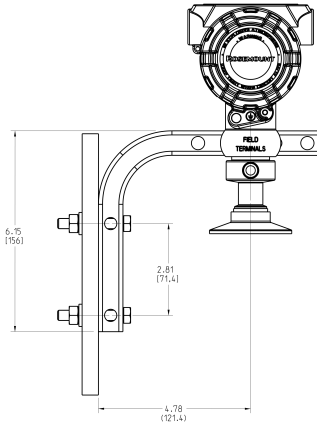
A. Hygienic clamp connection
B. 2-in. U-bolt for pipe mounting (clamp shown)
C. ¼-20 X 1.25 bolts for transmitter mounting
D. 5/16-20 X 1.25 bolts for panel mounting (not supplied)

Options

Standard configuration

Unless otherwise specified, transmitter is shipped as follows:

Engineering units	psi (all ranges)
4 mA[1]	0 (engineering units)
20 mA[1]	Upper range limit
Output	Linear
LCD display	Installed or none
Alarm[1]	High
Software tag	N/A
Damping	0.4 seconds

(1) *Not applicable to FOUNDATION Fieldbus and PROFIBUS PA. Protocols*

Custom configuration

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

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
- Scaled variable
- and more

For Rosemount™ 3051HT with HART Protocol, refer to the Rosemount 3051 Configuration Data Sheet.

Tagging (two options available)

- 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.
  - HART Revision 5: 8 characters
  - HART Revision 7: 32 characters
  - FOUNDATION Fieldbus: 32 characters
  - PROFIBUS PA: 32 Characters

Commissioning tag

For FOUNDATION Fieldbus only: A temporary commissioning tag is placed in the transmitter box. 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 for pressure include:

torr	psf[1]	cmH_2O at 4 °C[1]
atm	inH_2O	mH_2O at 4 °C[1]
Pa	inH_2O at 4 °C	inHg
kPa	inH_2O at 60 °F	mmHg
MPa	ftH_2O	cmHg at 0 °C[1]
hPa at 0 ºC[1]	ftH_2O at 4 °C[1]	mHg at 0 °C[1]
mbar	ftH_2O at 60 °F[1]	g/cm^2
bar	mmH_2O[2]	kg/m^2[1]
psi	mmH_2O at 4 °C	kg/cm^2
ftH_2O at 68 F[3]	mmH_20 at 68 F	inHg at 0 C

(1) *Field configurable only, not available for factory calibration or custom configuration (option code C1 "Software configuration").*
(2) *This unit is not available with PROFIBUS PA Protocol.*
(3) *Units only available with PROFIBUS PA Output.*

Display and Interface options

M4 Digital display with LOI

Available for 4–20 mA HART and PROFIBUS PA Protocols

M5 Digital display

- Two-line, 8-digit LCD display for 4–20 mA HART, FOUNDATION Fieldbus, and PROFIBUS PA Protocols

- Direct reading of digital data for higher accuracy

- Displays user-defined flow, level, volume, or pressure units

- Displays diagnostic messages for local troubleshooting

- 90° rotation capability for easy viewing

Configuration buttons

Rosemount 3051 will ship with no buttons unless option D4 (analog zero and span), DZ (digital zero), or M4 (LOI) for local configuration buttons are specified (only available with HART 4–20 mA output; code A and PROFIBUS PA).

External or rear/terminal side

Table 8: Button Configuration

Available with 4–20 mA HART and PROFIBUS PA Protocols. Housing material option 1 comes with rear/terminal-side buttons; housing material option 2 comes with external buttons.

Option codes	Internal	External or rear/terminal side
DZ	N/A	Digital zero trim
D4		Analog zero and trim
M4	LOI	LOI[1]
M4 + DZ		Digital zero trim
M4 + D4		Analog zero and trim

(1)   *Not provided with housing material option 1.*

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 x 20 μs)

6 kV crest (1.2 x 50 μs)

Emerson Automation Solutions

6021 Innovation Blvd.
Shakopee, MN 55379, USA
+1 800 999 9307 or +1 952 906 8888
+1 952 949 7001
RFQ.RMD-RCC@Emerson.com

North America Regional Office

Emerson Automation Solutions
8200 Market Blvd.
Chanhassen, MN 55317, USA
+1 800 999 9307 or +1 952 906 8888
+1 952 949 7001
RMT-NA.RCCRFQ@Emerson.com

Latin America Regional Office

Emerson Automation Solutions
1300 Concord Terrace, Suite 400
Sunrise, FL 33323, USA
+1 954 846 5030
+1 954 846 5121
RFQ.RMD-RCC@Emerson.com

Europe Regional Office

Emerson Automation Solutions Europe
GmbH
Neuhofstrasse 19a P.O. Box 1046
CH 6340 Baar
Switzerland
+41 (0) 41 768 6111
+41 (0) 41 768 6300
RFQ.RMD-RCC@Emerson.com

Asia Pacific Regional Office

Emerson Automation Solutions
1 Pandan Crescent
Singapore 128461
+65 6777 8211
+65 6777 0947
Enquiries@AP.Emerson.com

Middle East and Africa Regional Office

Emerson Automation Solutions
Emerson FZE P.O. Box 17033
Jebel Ali Free Zone - South 2
Dubai, United Arab Emirates
+971 4 8118100
+971 4 8865465
RFQ.RMTMEA@Emerson.com

Linkedin.com/company/Emerson-Automation-Solutions
Twitter.com/Rosemount_News
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