Specifications

PERFORMANCE SPECIFICATIONS

Total Performance is based on combined errors of reference accuracy, ambient temperature effect, and static pressure effect.
This product data sheet covers both HART and fieldbus protocols unless specified.

Conformance To Specification (±3σ (Sigma))

Technology leadership, advanced manufacturing techniques and statistical process control ensure specification conformance to at least ±3σ.

Reference Accuracy[1]

Models	Standard	High Accuracy Option
3051CD, 3051CG		
Range 0 (CD)	±0.10% of span For spans less than 2:1, accuracy = ±0.05% of URL	
Range 1	±0.10% of span For spans less than 15:1, accuracy = $\pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span	
Ranges 2-5	±0.065% of span For spans less than 10:1, accuracy = $\pm\left[0.015 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span	Ranges 2-4 High Accuracy Option, P8 ±0.04% of span For spans less than 5:1, accuracy = $\pm\left[0.015 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span
3051T		
Ranges 1-4	±0.065% of span For spans less than 10:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span	Ranges 2-4 High Accuracy Option, P8 ±0.04% of span For spans less than 5:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span
Range 5	±0.075% of span For spans less than 10:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span	
3051CA		
Ranges 1-4	±0.065% of span For spans less than 10:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span	Ranges 2-4 High Accuracy Option, P8 ±0.04% of span For spans less than 5:1, accuracy = $\pm\left[0.0075\left(\frac{URL}{Span}\right)\right]$% of Span
3051H/3051L		
All Ranges	±0.075% of span For spans less than 10:1, accuracy = $\pm\left[0.025 + 0.005\left(\frac{URL}{Span}\right)\right]$% of Span	

(1) For FOUNDATION fieldbus transmitters, use calibrated range in place of span. For zero based spans, reference conditions, silicone oil fill, SST materials, Coplanar flange (3051C) or 1/2 in. - 18 NPT (3051T) process connections, digital trim values set to equal range points.

Total Performance

For ±50 °F (28 °C) temperature changes, up to 1000 psi (6,9 MPa) line pressure (CD only), from 1:1 to 5:1 rangedown.

Models	Total Performance
3051C	
Ranges 2-5	±0.15% of span
3051T	
Ranges 1-4	±0.15% of span

Long Term Stability

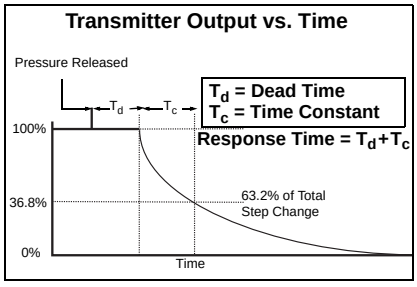
Models	Long Term Stability
3051C	
Ranges 2-5	±0.125% of URL for 5 years ±50 °F (28 °C) temperature changes, and up to 1000 psi (6,9 MPa) line pressure.
3051CD Low/Draft Range	
Ranges 0-1	±0.2% of URL for 1 year
3051T	
Ranges 1-4	±0.125% of URL for 5 years ±50 °F (28 °C) temperature changes, and up to 1000 psi (6,9 MPa) line pressure.
Rosemount 3051H	
Ranges 2-3	±0.1% of URL for 1 year
Ranges 4-5	±0.2% of URL for 1 year

Dynamic Performance

	4 - 20 mA (*HART* protocol)[1]	Fieldbus protocol[3]
Total Response Time (T_d + T_c)[2]:		
3051C, Ranges 2-5:	100 ms	152 ms
Range 1:	255 ms	307 ms
Range 0:	700 ms	752 ms
3051T:	100 ms	152 ms
3051H/L:	Consult factory	Consult factory
Dead Time (Td)	45 ms (nominal)	97 ms
Update Rate	22 times per second	22 times per second

(1) Dead time and update rate apply to all models and ranges; analog output only
(2) Nominal total response time at 75 °F (24 °C) reference conditions.
(3) Transmitter fieldbus output only, segment macro-cycle not included.

Typical HART Transmitter Response Time



Line Pressure Effect per 1000 psi (6,9 MPa)

For line pressures above 2000 psi (13,7 MPa), see user manual (Rosemount publication number 00809-0100-4001).

Models	Line Pressure Effect
3051CD	Zero Error[1]
Range 0	±0.125% of URL/100 psi (6,89 bar)
Range 1	±0.25% of URL/1000 psi (68,9 bar)
Ranges 2-3	±0.05% of URL/1000 psi (68,9 bar) for line pressures from 0 to 2000 psi (0 to 13,7 MPa)
	Span Error
Range 0	±0.15% of reading/100 psi (6,89 bar)
Range 1	±0.4% of reading/1000 psi (68,9 bar)
Ranges 2-3	±0.1% of reading/1000 psi (68,9 bar)
3051HD	Zero Error[1]
All Ranges	±0.1% of URL/1000 psi (68,9 bar) for line pressures from 0 to 2000 psi (0 to 13,7 MPa)
	Span Error
All Ranges	±0.1% of reading/1000 psi (68,9 bar)

(1) Can be calibrated out at line pressure.

Ambient Temperature Effect per 50°F (28°C)

Models		Ambient Temperature Effect
3051CD/CG		
	Range 0	±(0.25% URL + 0.05% span)
	Range 1	±(0.1% URL + 0.25% span)
	Ranges 2-5	±(0.0125% URL + 0.0625% span) from 1:1 to 5:1 ±(0.025% URL + 0.125% span) from 5:1 to 100:1
3051T		
	Range 1	±(0.025% URL + 0.125% span) from 1:1 to 10:1 ±(0.05% URL + 0.125% span) from 10:1 to 100:1
	Range 2-4	±(0.025% URL + 0.125% span) from 1:1 to 30:1 ±(0.035% URL + 0.125% span) from 30:1 to 100:1
	Range 5	±(0.1% URL + 0.15% span)
3051CA		
	All Ranges	±(0.025% URL + 0.125% span) from 1:1 to 30:1 ±(0.035% URL + 0.125% span) from 30:1 to 100:1
3051H		
	All Ranges	±(0.025% URL + 0.125% span + 0.35 inH_2O) from 1:1 to 30:1 ±(0.035% URL + 0.125% span + 0.35 inH_2O) from 1:1 to 30:1
3051L		See Rosemount Inc. Instrument Toolkit™ software.

Mounting Position Effects

Models	Mounting Position Effects
3051C	Zero shifts up to ±1.25 inH_2O (3,11 mbar), which can be calibrated out. No span effect.
3051H	Zero shifts up to ±5 inH_2O (12,43 mbar), which can be calibrated out. No span effect.
3051L	With liquid level diaphragm in vertical plane, zero shift of up to 1 inH_2O (2,49 mbar). With diaphragm in horizontal plane, zero shift of up to 5 inH_2O (12,43 mbar) plus extension length on extended units. All zero shifts can be calibrated out. No span effect.
3051T/CA	Zero shifts up to 2.5 inH_2O (6,22 mbar), which can be calibrated out. No span effect.

Vibration Effect

All Models

Measurement effect due to vibrations is negligible except at resonance frequencies. When at resonance frequencies, vibration effect is less than ±0.1% of URL per g when tested between 15 and 2000 Hz in any axis relative to pipe-mounted process conditions.

Power Supply Effect

All Models

Less than ±0.005% of calibrated span per volt.

RFI Effects

All Models

±0.1% of span from 20 to 1000 MHz and for field strength up to 30 V/m.

Transient Protection (Option Code T1)

All Models:

Meets IEEE C62.41, Category B

- 6 kV crest (0.5 μs - 100 kHz)
- 3 kV crest (8 × 20 microseconds)
- 6 kV crest (1.2 × 50 microseconds)

Meets IEEE C37.90.1, Surge Withstand Capability

- SWC 2.5 kV crest, 1.25 MHz wave form

General Specifications:

- Response Time: < 1 nanosecond
- Peak Surge Current: 5000 amps to housing
- Peak Transient Voltage: 100 V dc
- Loop Impedance: < 25 ohms
- Applicable Standards: IEC61000-4-4, IEC61000-4-5

NOTE:
Calibrations at 68 °F (20 °C) per ASME Z210.1 (ANSI)

FUNCTIONAL SPECIFICATIONS

Range and Sensor Limits

TABLE 1. 3051CD, 3051CG, 3051L, and 3051H Range and Sensor Limits

Range	Minimum Span	Range and Sensor Limits						
				Lower (LRL)				
	3051CD[1], CG, L, H	Upper (URL)	3051C Differential	3051C/ Gage	3051L Differential	3051L Gage	3051H Differential	3051H Gage
0	0.1 inH_2O (0,25 mbar)	3.0 inH_2O (7,47 mbar)	–3.0 inH_2O (-7,47 mbar)	NA	NA	NA	NA	NA
1	0.5 inH_2O (1,2 mbar)	25 inH_2O (62,3 mbar)	–25 inH_2O (–62,3 mbar)	–25 inH_2O (–62,3 mbar)	NA	NA	NA	NA
2	2.5 inH_2O (6,2 mbar)	250 inH_2O (0,62 bar)	–250 inH_2O (–0,62 bar)	–250 inH_2O (–0,62 bar)	–250 inH_2O (–0,62 bar)	–250 inH_2O (–0,62 bar)	–250 inH_2O (–0,62 bar)	–250 inH_2O (–0,62 bar)
3	10 inH_2O (24,9 mbar)	1000 inH_2O (2,49 bar)	–1000 inH_2O (–2,49 bar)	0.5 psia (34,5 mbar abs)	–1000 inH_2O (–2,49 bar)	0.5 psia (34,5 mbar abs)	–1000 inH_2O (–2,49 bar)	0.5 psia (34,5 mbar abs)
4	3 psi (0,20 bar)	300 psi (20,6 bar)	–300 psi (–20,6 bar)	0.5 psia (34,5 mbar abs)	–300 psi (–20,6 bar)	0.5 psia (34,5 mbar abs)	–300 psi (–20,6 bar)	0.5 psia (34,5 mbar abs)
5	20 psi (1,38 bar)	2000 psi (137,9 bar)	– 2000 psi (–137,9 bar)	0.5 psia (34,5 mbar abs)	NA	NA	– 2000 psi (–137,9 bar)	0.5 psia (34,5 mbar abs)

(1) Range 0 only available with 3051CD. Range 1 only available with 3051CD or 3051CG.

TABLE 2. Range and Sensor Limits

Range	3051CA		
	Minimum Span	Range and Sensor Limits	
		Upper (URL)	Lower (LRL)
1	0.3 psia (20,6 mbar)	30 psia (2,07 bar)	0 psia (0 bar)
2	1.5 psia (0,103 bar)	150 psia (10,3 bar)	0 psia (0 bar)
3	8 psia (0,55 bar)	800 psia (55,2 bar)	0 psia (0 bar)
4	40 psia (2,76 bar)	4000 psia (275,8 bar)	0 psia (0 bar)

Range	3051T			
	Minimum Span	Range and Sensor Limits		
		Upper (URL)	Lower (LRL)	Lower[1] (LRL) (Gage)
1	0.3 psi (20,6 mbar)	30 psi (2,07 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
2	1.5 psi (0,103 bar)	150 psi (10,3 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
3	8 psi (0,55 bar)	800 psi (55,2 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
4	40 psi (2,76 bar)	4000 psi (275,8 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)
5	2000 psi (137,9 bar)	10000 psi (689,4 bar)	0 psia (0 bar)	–14.7 psig (–1,01 bar)

(1) Assumes atmospheric pressure of 14.7 psig.

Zero and Span Adjustment Requirements (*HART* and Low Power)

Zero and span values can be set anywhere within the range limits stated in Table 1 and Table 2.

Span must be greater than or equal to the minimum span stated in Table 1 and Table 2.

Service

Liquid, gas, and vapor applications

4–20 mA (Output Code A)

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 the *HART* protocol.

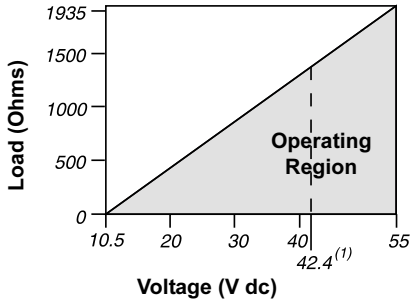
Power Supply

External power supply required. Standard transmitter (4–20 mA) operates on 10.5 to 55 V dc with no load.

Load Limitations

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

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



Communication requires a minimum loop resistance of 250 ohms.

(1) For CSA approval, power supply must not exceed 42.4 V.

FOUNDATION fieldbus (output code F) and Profibus (output code W)

Power Supply

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

Current Draw

17.5 mA for all configurations (including LCD display option)

FOUNDATION fieldbus Function Block Execution Times

Block	Execution Time
Resource	-
Transducer	-
LCD Block	-
Analog Input 1, 2	30 milliseconds
PID	45 milliseconds
Input Selector	30 milliseconds
Arithmetic	35 milliseconds
Signal Characterizer	40 milliseconds
Integrator	35 milliseconds

FOUNDATION fieldbus Parameters

Schedule Entries	7 (max.)
Links	20 (max.)
Virtual Communications Relationships (VCR)	12 (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 Block

Configures the local display.

2 Analog Input Blocks

Processes the measurements for input into other function blocks. The output value is in engineering units or custom and contains a status indicating measurement quality.

PID Block

Contains all logic to perform PID control in the field including cascade and feedforward.

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.

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 seals, 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.

FOUNDATION fieldbus Diagnostics Suite (Option Code D01)

The 3051C *FOUNDATION* fieldbus Diagnostics provide Abnormal Situation Prevention (ASP) indictation. The integral statistical process monitoring (SPM) technology calculates the mean and standard deviation of the process variable 22 times per second. The 3051C ASP algorithm uses these values and highly flexible configuration options for customization to many user-defined or application specific abnormal situations. The detection of plugged impulse lines is the first available predefined application.

Low Power (Output Code M)

Output

Three wire 1–5 V dc or 0.8–3.2 V dc (Option Code C2) user-selectable output. Also user selectable for linear or square root output configuration. Digital process variable superimposed on voltage signal, available to any host conforming to the *HART* protocol. Low-power transmitter operates on 6–12 V dc with no load.

Power Consumption

3.0 mA, 18–36 mW

Minimum Load Impedance

100 kΩ (V_{out} wiring)

Indication

Optional 5-digit LCD display

Overpressure Limits

Rosemount 3051CD/CG

- Range 0: 750 psi (51,7 bar)
- Range 1: 2000 psig (137,9 bar)
- Ranges 2–5: 3626 psig (250 bar)
  4500 psig (310,3 bar) for option code P9

Rosemount 3051CA

- Range 1: 750 psia (51,7 bar)
- Range 2: 1500 psia (103,4 bar)
- Range 3: 1600 psia (110,3 bar)
- Range 4: 6000 psia (413,7 bar)

Rosemount 3051H

- All Ranges: 3626 psig (25 MPa)

Rosemount 3051TG/TA

- Range 1: 750 psi (51,7 bar)
- Range 2: 1500 psi (103,4 bar)
- Range 3: 1600 psi (110,3 bar)
- Range 4: 6000 psi (413,7 bar)
- Range 5: 15000 psi (1034,2 bar)

For 3051L or Level Flange Option Codes FA, FB, FC, FD, FP, and FQ, limit is 0 psia to the flange rating or sensor rating, whichever is lower.

TABLE 3. 3051L and Level Flange Rating Limits

Standard	Type	CS Rating	SST Rating
ANSI/ASME	Class 150	285 psig	275 psig
ANSI/ASME	Class 300	740 psig	720 psig
ANSI/ASME	Class 600	1480 psig	1440 psig
At 100 °F (38 °C), the rating decreases with increasing temperature.			
DIN	PN 10–40	40 bar	40 bar
DIN	PN 10/16	16 bar	16 bar
DIN	PN 25/40	40 bar	40 bar
At 248 °F (120 °C), the rating decreases with increasing temperature.			

Static Pressure Limit

Rosemount 3051CD Only

Operates within specifications between static line pressures of 0.5 psia and 3626 psig (4500 psig for Option Code P9).

Range 0: 0.5 psia and 750 psig

Range 1: 0.5 psia and 2000 psig

Burst Pressure Limits

Burst pressure on *Coplanar*, traditional, or 3051H process flange is 10000 psig (69 MPa).

Burst pressure for the 3051T is

Ranges 1–4: 11000 psi (75,8 MPa)

Range 5: 26000 psig (179 MPa)

Failure Mode Alarm

Output Code A

If self-diagnostics detect a gross transmitter failure, the analog signal will be driven either below 3.75 mA or to 21.75 mA to alert the user. NAMUR-compliant values are available, option code C4. High or low alarm signal is user-selectable by internal jumper.

Output Code M

If self-diagnostics detect a gross transmitter failure, the analog signal will be driven either below 0.94 V or above 5.4 V to alert the user (below 0.75 V or above 4.4 V for Option C2). High or low alarm signal is user-selectable by internal jumper.

Output Code F and W

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

Temperature Limits

Ambient

–40 to 185 °F (–40 to 85 °C)

With integral meter: –4 to 175 °F (–20 to 80 °C)

Storage

–50 to 230 °F (–46 to 110 °C)

With integral meter: –40 to 185 °F (–40 to 85 °C)

Process

At atmospheric pressures and above. See Table 4

TABLE 4. 3051 Process Temperature Limits

3051CD, 3051CG, 3051CA	
Silicone Fill Sensor[1]	
with *Coplanar* Flange	–40 to 250 °F (–40 to 121 °C)[2]
with Traditional Flange	–40 to 300 °F (–40 to 149 °C)[2][3]
with Level Flange	–40 to 300 °F (–40 to 149 °C)[2]
with 305 Integral Manifold	–40 to 300 °F (–40 to 149 °C)[2]
Inert Fill Sensor[1]	0 to 185 °F (–18 to 85 °C)[4][5]
3051H (Process Fill Fluid)	
D.C.® Silicone 200[1]	–40 to 375 °F (–40 to 191 °C)
Inert[1]	–50 to 350 °F (–45 to 177 °C)
Neobee M-20®[1]	0 to 375 °F (–18 to 191 °C)
3051T (Process Fill Fluid)	
Silicone Fill Sensor[1]	–40 to 250 °F (–40 to 121 °C)[2]
Inert Fill Sensor[1]	–22 to 250 °F (–30 to 121 °C)[2]
3051L Low-Side Temperature Limits	
Silicone Fill Sensor[1]	–40 to 250 °F (–40 to 121 °C)[2]
Inert Fill Sensor[1]	0 to 185 °F (–18 to 85 °C)[2]
3051L High-Side Temperature Limits (Process Fill Fluid)	
Syltherm® XLT	–100 to 300 °F (–73 to 149 °C)
D.C. Silicone 704®	60 to 400 °F (15 to 205 °C)
D.C. Silicone 200	–40 to 400 °F (–40 to 205 °C)
Inert	–50 to 350 °F (–45 to 177 °C)
Glycerin and Water	0 to 200 °F (–18 to 93 °C)
Neobee M-20	0 to 400 °F (–18 to 205 °C)
Propylene Glycol and Water	0 to 200 °F (–18 to 93 °C)

(1) Process temperatures above 185 °F (85 °C) require derating the ambient limits by a 1.5:1 ratio (0.6:1 ratio for the 3051H).

(2) 220 °F (104 °C) limit in vacuum service; 130 °F (54 °C) for pressures below 0.5 psia.

(3) 3051CD0 process temperature limits are –40 to 212 °F (–45 to 100 °C)

(4) 160 °F (71 °C) limit in vacuum service.

(5) Not available for 3051CA.

Humidity Limits

0–100% relative humidity

Turn-On Time

Performance within specifications less than 2.0 seconds (10.0 s for Profibus protocol) after power is applied to the transmitter

Volumetric Displacement

Less than 0.005 in^3 (0,08 cm^3)

Damping

Analog output response to a step input change is user-selectable from 0 to 36 seconds for one time constant. This software damping is in addition to sensor module response time.

PHYSICAL SPECIFICATIONS

Electrical Connections

1/2–14 NPT, PG 13.5, G1/2, and M20 × 1.5 (CM20) conduit. *HART* interface connections fixed to terminal block.

Process Connections

All Models except 3051L and 3051T

1/4–18 NPT on 2 1/8-in. centers

1/2–14 NPT on 2-, 2 1/8-, or 2 1/4-in. centers

Rosemount 3051L

High pressure side: 2-, 3-, or 4-in., ASME B 16.5 (ANSI) Class 150, 300 or 600 flange; 50, 80 or 100 mm, PN 40 or 10/16 flange

Low pressure side: 1/4–18 NPT on flange 1/2–14 NPT on adapter

Rosemount 3051T

1/2–14 NPT female. A DIN 16288 Male (available in SST for Range 1–4 transmitters only), or Autoclave type F-250-C (Pressure relieved 9/16–18 gland thread; 1/4 OD high pressure tube 60° cone; available in SST for Range 5 transmitters only).

Process-Wetted Parts

Drain/Vent Valves

316 SST, *Hastelloy* C276, or *Monel* material (*Monel* not available with 3051L or 3051H)

Process Flanges and Adapters

Plated carbon steel, SST cast CF-8M (cast version of 316 SST, material per ASTM-A743), C-Type cast alloy CW12MW, or *Monel* cast alloy M30C

Wetted O-rings

Glass-filled PTFE or Graphite-filled PTFE

Process Isolating Diaphragms

Isolating Diaphragm Material	3051CD/CG	3051T	3051CA	3051H
316L SST	•	•	•	•
Hastelloy C276	•	•	•	•
Monel	•		•	
Tantalum	•			•
Gold-plated *Monel*	•		•	
Gold-plated SST	•		•	

Rosemount 3051L Process Wetted Parts

Flanged Process Connection (Transmitter High Side)

Process Diaphragms, Including Process Gasket Surface

- 316L SST, *Hastelloy* C276, or Tantalum

Extension

- CF-3M (Cast version of 316L SST, material per ASTM-A743), or *Hastelloy* C276. Fits schedule 40 and 80 pipe.

Mounting Flange

- Zinc-cobalt plated CS or SST

Reference Process Connection (Transmitter Low Side)

Isolating Diaphragms

- 316L SST or *Hastelloy* C276

Reference Flange and Adapter

- CF-8M (Cast version of 316 SST, material per ASTM-A743)

Non-Wetted Parts

Electronics Housing

Low-copper aluminum or CF-3M (Cast version of 316L SST, material per ASTM-A743). NEMA 4X, IP 65, IP 66

Coplanar Sensor Module Housing

CF-3M (Cast version of 316L SST, material per ASTM-A743)

Bolts

ASTM A449, Type 1 (zinc-cobalt plated carbon steel)
ASTM F593G, Condition CW1 (Austenitic 316 SST)
ASTM A193, Grade B7M (zinc plated alloy steel)
Monel K-500

Sensor Module Fill Fluid

Silicone oil (D.C. 200) or Fluorocarbon oil (Halocarbon or Fluorinert® FC-43 for 3051T)

Process Fill Fluid (3051L and 3051H only)

3051L: Syltherm XLT, D.C. Silicone 704,
D.C. Silicone 200, inert, glycerin and water, Neobee M-20 or propylene glycol and water

3051H: inert, Neobee M-20, or D.C. Silicone 200

Paint

Polyurethane

Cover O-rings

Buna-N

Shipping Weights

Refer to “Shipping Weights” on page 38

Product Certifications

Approved Manufacturing Locations

Rosemount Inc. — Chanhassen, Minnesota USA
Emerson Process Management GmbH & Co. — Wessling, Germany
Emerson Process Management Asia Pacific Private Limited — Singapore
Beijing Rosemount Far East Instrument Co., LTD — Beijing, China

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting an Emerson Process Management representative.

ATEX Directive (94/9/EC)

All 3051 transmitters comply with the ATEX Directive.

European Pressure Equipment Directive (PED) (97/23/EC)

3051CA4; 3051CG2, 3, 4, 5; 3051CD2, 3, 4, 5 *(also with P9 option)*; 3051HD2, 3, 4, 5; 3051HG2, 3, 4, 5; 3051PD2, 3; and 3051PG2, 3, 4, 5 Pressure Transmitters
— QS Certificate of Assessment - EC No. PED-H-20 Module H Conformity Assessment

All other 3051/3001 Pressure Transmitters

— Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold

— Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (89/336/EEC)

All 3051 Pressure Transmitters meet all of the requirements of IECEN61326 and NAMUR NE-21

Ordinary Location Certification for Factory Mutual

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

HART PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.
T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019; Non-incendive for Class I, Division 2, Groups A, B, C, and D.
Temperature Code:T4 (Ta = 40 °C), T3 (Ta = 85 °C), Enclosure Type 4X
For input parameters see control drawing 03031-1019.

Canadian Standards Association (CSA)

E6 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D for indoor and outdoor hazardous locations. Enclosure type 4X, factory sealed

C6 Explosion-Proof and intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03031-1024. Temperature Code T3C.
Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 03031-1024.

European Certifications

I1 ATEX Intrinsic Safety and Dust
Certification No.: BAS 97ATEX1089X ⟨Ex⟩ II 1 GD
EEx ia IIC T5 (–60 ≤ T_a ≤ +40 °C)
EEx ia IIC T4 (–60 ≤ T_a ≤ +70 °C)
Dust Rating: T80 °C (–20 ≤ T_a ≤ 40 °C) IP66
CE 1180

TABLE 5. Input Parameters

U_i = 30V
I_i = 200 mA
P_i = 0.9W
C_i = 0.012 µF

Special Conditions for Safe Use (X):
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020:1994. This must be taken into account when installing the apparatus.

N1 ATEX Type n and Dust
Certification No.: BAS 00ATEX3105X ⟨Ex⟩ II 3 GD
EEx nL IIC T5 (–40 ≤ T_a ≤ +70 °C)
U_i = 55 Vdc max
Dust rating: T80 °C (–20 ≤ T_a ≤ 40 °C) IP66
CE

Special Conditions for Safe Use (X):
When the optional transient protection terminal block is installed, the apparatus is not capable of withstanding a 500V r.m.s. test to case. This must be taken into account on any installation in which it is used, for example by assuring that the supply to the apparatus is galvanically isolated.

E8 ATEX Flame-Proof and Dust
Certification No.: KEMA 00ATEX2013X ⟨Ex⟩ II 1/2 GD
EEx d IIC T6 (–50 ≤ T_a ≤ 65 °C)
EEx d IIC T5 (–50 ≤ T_a ≤ 80 °C)
Dust rating T90 °C, IP66
CE 1180
Vmax = 55 V dc

Special Conditions for Safe Use (X):
This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

Japanese Certifications

E4 JIS Flame-Proof
Ex d IIC T6

Certificate	Description
C15850	3051C/D/1 4–20 mA *HART* — no meter
C15851	3051C/D/1 4–20 mA *HART* — with meter
C15854	3051T/G/1 4–20 mA *HART*, SST, Silicon — no meter
C15855	3051T/G/1 4–20 mA *HART*, *Hastelloy* C276, Silicon — no meter
C15856	3051T/G/1 4–20 mA *HART*, SST, Silicon — with meter
C15857	3051T/G/1 4–20 mA *HART*, *Hastelloy* C276, Silicon — with meter

I4 JIS Intrinsic Safety
Ex ia IIC T4

Certificate	Description
C16406	3051CD/CG

Australian Certifications

I7 SAA Intrinsic Safety
Certification No.: AUS Ex 1249X
Ex ia IIC T4 (T_{amb} = 70 °C)
Ex ia IIC T5 (T_{amb} = 40 °C)
IP66
When connected per Rosemount drawing 03031-1026

TABLE 6. Input Parameters

U_i = 30V
I_i = 200 mA
I_i = 160 mA (output code A with T1)
P_i = 0.9W
C_i = 0.01 µF
C_i = 0.042 µF (output code M)
L_i = 10 µH
L_i = 1.05 mH (output code A with T1)
L_i = 0.75 mH (output code M with T1)

Special Conditions for Safe Use (X):
The apparatus may only be used with a passive current limited power source Intrinsic Safety application. The power source must be such that Po ≤ (Uo * Io) / 4. Modules using transient protection in the terminal assembly (T1 transient protection models) the apparatus enclosure is to be electrically bonded to the protective earth. The conductor used for the connection shall be equivalent to a copper conductor of 4 mm2 minimum cross-sectional area.

E7 SAA Explosion-Proof (Flame-Proof)
Certification No.: AUS Ex 03.1347X
Ex d IIC T6 (T_{amb} = 40 °C)
Ex d IIC T5 (T_{amb} = 80 °C)
DIP A21 T6 (T_{amb} = 40 °C)
DIP A21 T5 (T_{amb} = 80 °C)
IP66

Special Conditions for Safe Use (X):
It is a condition of safe use for transmitter enclosures having cable entry thread other than metric conduit thread that the equipment be utilized with an appropriate certified thread adaptor.

N7 SAA Type n (Non-sparking)
Certification No.: AUS Ex 1249X
Ex n IIC T4 (T_{amb} = 70 °C)
Ex n IIC T5 (T_{amb} = 40 °C)
IP66

Special Conditions for Safe Use (X):
Where the equipment is installed such that there is an unused conduit entry, it must be sealed with a suitable blanking plug to maintain the IP40 degree of protection. Any blanking plug used with the equipment shall be of a type which requires the use of a tool to effect its removal. Voltage source shall not exceed 60V ac or 75V dc.

Combinations of Certifications

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

K5 **E5** and **I5** combination

KB **K5** and **C6** combination

KD **K5**, **C6**, **I1**, and **E8** combination

K6 **C6**, **I1**, and **E8** combination

K8 **E8** and **I1** combination

K7 **E7**, **I7**, and **N7** combination

FIELDBUS PROTOCOL

Hazardous Locations Certifications

North American Certifications

FM Approvals

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II, Division 1, Groups E, F, and G. Dust-Ignition-Proof for Class III, Division 1.

T5 (Ta = 85 °C), Factory Sealed, Enclosure Type 4X

I5 Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 when connected per Rosemount drawing 03031-1019; Non-incendive for Class I, Division 2, Groups A, B, C, and D.

Temperature Code:T4 (Ta = 40 °C), T3 (Ta = 85 °C), Enclosure Type 4X
For input parameters see control drawing 03031-1019.

Canadian Standards Association (CSA)

E6 Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D for indoor and outdoor hazardous locations. Enclosure type 4X, factory sealed

C6 Explosion-Proof and intrinsically safe approval. Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawings 03031-1024. Temperature Code T3C.
Explosion-Proof for Class I, Division 1, Groups B, C, and D. Dust-Ignition-Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2 Groups A, B, C, and D hazardous locations. Enclosure type 4X, factory sealed
For input parameters see control drawing 03031-1024.

European Certifications

I1 ATEX Intrinsic Safety and Dust
Certification No.: BAS 98ATEX1355X ⟨Ex⟩ II 1 GD
EEx ia IIC T4 (T_{amb} = –60 to +60 °C)
Dust Rating: T70 °C (T_{amb} –20 to 40 °C) IP66
CE 1180

TABLE 7. Input Parameters

U_i = 30V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020:1994. This must be taken into account when installing the apparatus.

IA ATEX FISCO Intrinsic Safety
Certification No.: BAS 98ATEX1355X ⟨Ex⟩ II 1 G
EEx ia IIC T4 (T_{amb} = –60 to +60 °C)
IP66
CE 1180

TABLE 8. Input Parameters

U_i = 17.5 V
I_i = 380 mA
P_i = 5.32 W
C_i = ≤ 5 µF
L_i = ≤ 10 µH

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020:1994. This must be taken into account when installing the apparatus.

N1 ATEX Type n and Dust
Certification No.: BAS 98ATEX3356X ⟨Ex⟩ II 3 GD
EEx nL IIC T5 (T_{amb} = –40 to +70 °C)
U_i = 40 Vdc max
Dust rating: T80 °C (T_{amb} = –20 to 40 °C) IP66

Special Conditions for Safe Use (X):
The device is not capable of withstanding the 500V insulation test required by Clause 6.4.12 of EN50020:1994. This must be taken into account when installing the apparatus.

E8 ATEX Flame-Proof and Dust
Certification No.: KEMA 00ATEX2013X ⟨Ex⟩ II 1/2 GD
EEx d IIC T6 (T_{amb} = –50 to 65 °C)
EEx d IIC T5 (T_{amb} = –50 to 80 °C)
Dust rating T90 °C, IP66
CE 1180
Vmax = 55 V dc

Special Conditions for Safe Use (X):
This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

Japanese Certifications

E4 JIS Flame-Proof
Ex d IIC T6

Certificate	Description
C15852	3051C/D/1 *FOUNDATION* Fieldbus — no meter
C15853	3051C/D/1 *FOUNDATION* Fieldbus — with meter
C15858	3051T/G/1 *FOUNDATION* Fieldbus, SST, Silicon — no meter
C15859	3051T/G/1 *FOUNDATION* Fieldbus, *Hastelloy* C276, Silicon — no meter
C15860	3051T/G/1 *FOUNDATION* Fieldbus, SST, Silicon — with meter
C15861	3051T/G/1 *FOUNDATION* Fieldbus, *Hastelloy* C276, Silicon — with meter

Australian Certifications

I7 SAA Intrinsic Safety
Certification No.: AUS Ex 1249X
Ex ia IIC T4 (T_{amb} = 60 °C)
IP66
When connected per Rosemount drawing 03031-1026.

TABLE 9. Input Parameters

U_i = 30 V
I_i = 300 mA
P_i = 1.3 W
C_i = 0 µF
L_i = 0 µH

Special Conditions for Safe Use (X):
The apparatus may only be used with a passive current limited power source Intrinsic Safety application. The power source must be such that Po ≤ (Uo * Io) / 4. Modules using transient protection in the terminal assembly (T1 transient protection models) the apparatus enclosure is to be electrically bonded to the protective earth. The conductor used for the connection shall be equivalent to a copper conductor of 4 mm2 minimum cross-sectional area.

E7 SAA Explosion-Proof (Flame-Proof)
Certification No.: AUS Ex 1347X
Ex d IIC T6 (T_{amb} = 40 °C)
Ex d IIC T5 (T_{amb} = 80 °C)
DIP A21 T6 (T_{amb} = 40 °C)
DIP A21 T5 (T_{amb} = 80 °C)
IP65

Special Conditions for Safe Use (X):
It is a condition of safe use for transmitter enclosures having cable entry thread other than metric conduit thread that the equipment be utilized with an appropriate certified thread adaptor.

N7 SAA Type n (Non-sparking)
Certification No.: AUS Ex 1249X
Ex n IIC T4 (T_{amb} = 70 °C)
Ex n IIC T5 (T_{amb} = 40 °C)
IP66

Special Conditions for Safe Use (X):
Where the equipment is installed such that there is an unused conduit entry, it must be sealed with a suitable blanking plug to maintain the IP40 degree of protection. Any blanking plug used with the equipment shall be of a type which requires the use of a tool to effect its removal. Voltage source shall not exceed 60V ac or 75V dc.

Combinations of Certifications

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

K5 **E5** and **I5** combination
KB **K5** and **C6** combination
KD **K5**, **C6**, **I1**, and **E8** combination
K6 **C6**, **I1**, and **E8** combination
K8 **E8** and **I1** combination
K7 **E7**, **I7**, and **N7** combination