

Specifications

PERFORMANCE SPECIFICATIONS

For zero-based spans, reference conditions, silicone oil fill, glass-filled TFE o-rings, SST materials, *Coplanar* flange (3051S_C) or 1/2 in.- 14 NPT (3051S_T) 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 specification conformance to $\pm 3\sigma$ or better.

Reference Accuracy

Models	Ultra ^{(1) (2) (3)}	Classic ^{(1) (2) (3)}	Ultra for Flow ^{(1) (4)}
3051S_CD, CG			
Ranges 2 - 4	$\pm 0.025\%$ of span. For spans less than 10:1, $\pm \left[0.005 + 0.0035 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	$\pm 0.055\%$ of span. For spans less than 10:1, $\pm \left[0.015 + 0.005 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	$\pm 0.04\%$ of reading up to 8:1 DP turndown from URL; $\pm [0.04 + 0.0023 (\text{URL}/\text{RDG}^{(5)})] \%$ reading to 200:1 DP turndown from URL
Range 5	$\pm 0.05\%$ of span. For spans less than 10:1, $\pm \left[0.005 + 0.0045 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	$\pm 0.065\%$ of span. For spans less than 10:1, $\pm \left[0.015 + 0.005 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	
Range 1	$\pm 0.09\%$ of span. For spans less than 15:1, $\pm \left[0.015 + 0.005 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	$\pm 0.10\%$ of span. For spans less than 15:1, $\pm \left[0.025 + 0.005 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	
Range 0	$\pm 0.09\%$ of span. For spans less than 2:1 = $\pm 0.045\%$ of URL	$\pm 0.10\%$ of span. For spans less than 2:1 = $\pm 0.05\%$ of URL	
3051S_T			
Ranges 1 - 4	$\pm 0.025\%$ of span. For spans less than 10:1, $\pm \left[0.004 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	$\pm 0.055\%$ of span. For spans less than 10:1, $\pm \left[0.0065 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	
Range 5	$\pm 0.04\%$ of span. For spans less than 10:1, $\pm \left[0.004 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	$\pm 0.065\%$ of span. For spans less than 10:1, $\pm \left[0.0065 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	
3051S_CA			
Ranges 1 - 4	$\pm 0.025\%$ of span. For spans less than 10:1, $\pm \left[0.004 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	$\pm 0.055\%$ of span. For spans less than 10:1, $\pm \left[0.0065 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	
Range 0	$\pm 0.075\%$ of span. For spans less than 5:1, $\pm \left[0.025 + 0.01 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	$\pm 0.075\%$ of span. For spans less than 5:1, $\pm \left[0.025 + 0.01 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	
3051S_L			
	$\pm 0.065\%$ of span. For spans less than 10:1, $\pm \left[0.015 + 0.005 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	$\pm 0.065\%$ of span. For spans less than 10:1, $\pm \left[0.015 + 0.005 \left(\frac{\text{URL}}{\text{span}} \right) \right] \%$ of span	

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

(2) For FOUNDATION fieldbus transmitters, use calibrated range in place of span.

(3) For the 3051S SIS Safety Transmitter, follow Classic transmitter specifications. Rangedown is limited to 10:1 with the exception of range 0. The 3051S2CD0 is limited to 2:1 rangedown, 3051S2CA0 is limited to 5:1 rangedown.

(4) Ultra for Flow applicable for CD Ranges 2-3 only. For calibrated spans from 1:1 to 2:1 of URL, add $\pm 0.005\%$ of span analog output error.

(5) RDG refers to transmitter reading.

Rosemount 3051S Series

Total Performance

Models	Ultra ⁽¹⁾	Classic ⁽¹⁾	Ultra for Flow ⁽¹⁾⁽²⁾
3051S_			
CD Ranges 2-3	±0.1% of span; for ±50°F (28°C)	±0.15% of span; for ±50°F (28°C)	±0.1% of reading; for ±50°F (28°C)
CG Ranges 2-5	temperature changes; 0-100%	temperature changes; 0-100%	temperature changes; 0-100%
T Ranges 2-4	relative humidity, up to 740 psi	relative humidity, up to 740 psi	relative humidity, up to 740 psi
CA Ranges 2-4	(51 bar) line pressure (CD only), from 1:1 to 5:1 rangedown.	(51 bar) line pressure (CD only), from 1:1 to 5:1 rangedown.	(51 bar) line pressure, over 8:1 DP turndown from URL.

(1) Total performance is based on combined errors of reference accuracy, ambient temperature effect, and line pressure effect.

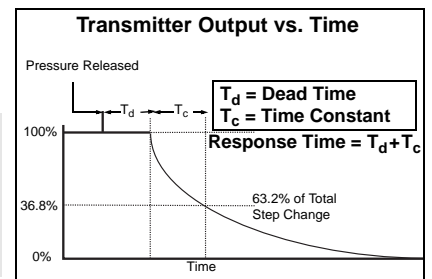
(2) Ultra for Flow applicable for CD Ranges 2-3 only.

Long Term Stability

Models	Ultra and Ultra for Flow	Classic
3051S_		
CD Ranges 2 - 5	±0.20% of URL for 10 years; for ±50°F (28°C)	±0.125% of URL for 5 years; for ±50°F (28°C)
CG Ranges 2 - 5	temperature changes, up to 1000 psi (68,9 bar)	temperature changes, up to 1000 psi (68,9 bar)
T Ranges 1 - 5 and CA Ranges 1 - 4	line pressure (CD only)	line pressure (CD only)

Dynamic Performance

	4 - 20 mA (HART®) ⁽¹⁾	Fieldbus protocol ⁽²⁾	Typical Transmitter Response Time
Total Response Time (Td + Tc)⁽³⁾:			
3051S_C, Ranges 2 - 5:	100 milliseconds	152 milliseconds	
Range 1:	255 milliseconds	307 milliseconds	
Range 0:	700 milliseconds	752 milliseconds	
3051S_T:	100 milliseconds	152 milliseconds	
3051S_L:	See <i>Instrument Toolkit</i> ™.	See <i>Instrument Toolkit</i>	
Process Variable Response Time			
3051S SIS, Ranges 2 - 5	220 milliseconds	Not Applicable	
Range 1:	375 milliseconds	Not Applicable	
Range 0:	820 milliseconds	Not Applicable	
3051S_T:	220 milliseconds	Not Applicable	
3051S_L:	See <i>Instrument Toolkit</i> ™.	Not Applicable	
Dead Time (Td)⁽⁴⁾	45 milliseconds (nominal)	97 milliseconds	
Update Rate			
3051S	22 times per second	22 times per second	
3051S SIS	11 times per second	Not Applicable	



(1) Dead time and update rate apply to all models and ranges; analog output only

(2) Transmitter fieldbus output only, segment macro-cycle not included.

(3) Nominal total response time at 75 °F (24 °C) reference conditions. For option code DA1, add 40 milliseconds (nominal) to 4-20 mA (HART®) total response time values.

(4) For option code DA1, dead time (Td) is 85 milliseconds (nominal).

Ambient Temperature Effect

Models	Ultra	Classic	Ultra for Flow ⁽¹⁾
3051S_CD, CG	per 50 °F (28 °C)	per 50 °F (28 °C)	From -40 to 185 °F (-40 to 85 °C): ±0.13% reading up to 8:1 DP turndown from URL; ±[0.13 + 0.0187 (URL/RDG ⁽²⁾)]% reading to 100:1 DP turndown from URL
Range 2 - 5 ⁽³⁾	± (0.009% URL + 0.025% span) from 1:1 to 10:1 ± (0.018% URL + 0.08% span) from >10:1 to 200:1	± (0.0125% URL + 0.0625% span) from 1:1 to 5:1 ± (0.025% URL + 0.125% span) from >5:1 to 100:1	
Range 0	± (0.25% URL + 0.05% span) from 1:1 to 30:1	± (0.25% URL + 0.05% span) from 1:1 to 30:1	
Range 1	± (0.1% URL + 0.25% span) from 1:1 to 50:1	± (0.1% URL + 0.25% span) from 1:1 to 50:1	
3051S_T			
Ranges 2 - 4	± (0.009% URL + 0.025% span) from 1:1 to 10:1 ± (0.018% URL + 0.08% span) from >10:1 to 200:1	± (0.0125% URL + 0.0625% span) from 1:1 to 5:1 ± (0.025% URL + 0.125% span) from >5:1 to 100:1	
Range 5	± (0.05% URL + 0.075% span) from 1:1 to 10:1	± (0.05% URL + 0.075% span) from 1:1 to 5:1	
Range 1	± (0.0125% URL + 0.0625% span) from 1:1 to 5:1 ± (0.025% URL + 0.125% span) from >5:1 to 200:1	± (0.0125% URL + 0.0625% span) from 1:1 to 5:1 ± (0.025% URL + 0.125% span) from >5:1 to 100:1	
3051S_CA			
Ranges 2 - 4	± (0.009% URL + 0.025% span) from 1:1 to 10:1 ± (0.018% URL + 0.08% span) from >10:1 to 200:1	± (0.0125% URL + 0.0625% span) from 1:1 to 5:1 ± (0.025% URL + 0.125% span) from >5:1 to 100:1	
Range 0	± (0.1% URL + 0.25% span) from 1:1 to 30:1	± (0.1% URL + 0.25% span) from 1:1 to 30:1	
Range 1	± (0.0125% URL + 0.0625% span) from 1:1 to 5:1 ± (0.025% URL + 0.125% span) from >5:1 to 100:1	± (0.0125% URL + 0.0625% span) from 1:1 to 5:1 ± (0.025% URL + 0.125% span) from >5:1 to 100:1	
3051S_L	See <i>Instrument Toolkit</i> [™] .	See <i>Instrument Toolkit</i> .	

(1) Ultra for Flow applicable for CD Ranges 2-3 only.

(2) RDG refers to transmitter reading.

(3) Use Classic specification for 3051S_CD Range 5 Ultra.

Line Pressure Effect

For line pressures above 2000 psi (137,9 bar) and ranges 4-5, see the 3051S Series reference manual (document number 00809-0100-4801).

Models	Ultra and Ultra for Flow	Classic
3051S_CD	Zero Error⁽¹⁾	Zero Error⁽¹⁾
	Range 2 - 3 ± 0.025% URL per 1000 psi (69 bar)	± 0.05% URL per 1000 psi (69 bar)
	Range 0 ± 0.125% URL per 100 psi (6,89 bar) Range 1 ± 0.25% URL per 1000 psi (69 bar)	± 0.125% URL per 100 psi (6,89 bar) ± 0.25% URL per 1000 psi (69 bar)
	Span Error	Span Error
	Range 2 -3 ± 0.1% of reading per 1000 psi (69 bar) Range 0 ± 0.15% of reading per 100 psi (6,89 bar) Range 1 ± 0.4% of reading per 1000 psi (69 bar)	± 0.1% of reading per 1000 psi (69 bar) ± 0.15% of reading per 100 psi (6,89 bar) ± 0.4% of reading per 1000 psi (69 bar)

(1) Zero error can be calibrated out

Mounting Position Effects

Models	Ultra, Ultra for Flow, and Classic
3051S_C	Zero shifts up to ±1.25 inH ₂ O (3,11 mbar), which can be calibrated out; no span effect
3051S_L	With liquid level diaphragm in vertical plane, zero shift of up to 1 inH ₂ O (25,4 mmH ₂ O); with diaphragm in horizontal plane, zero shift of up to 5 inH ₂ O (127 mmH ₂ O) plus extension length on extended units; all zero shifts can be calibrated out; no span effect
3051S_T and 3051S_CA	Zero shifts to 2.5 inH ₂ O (63,5 mmH ₂ O), which can be calibrated out; no span effect

Vibration Effect

Less than ±0.1% of URL when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10-60 Hz 0.21mm displacement peak amplitude / 60-2000 Hz 3g).

Housing Style codes 1J, 1K, 1L, 2J

Less than ±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 0.15mm displacement peak amplitude / 60-500 Hz 2g).

Power Supply Effect

All Models:

Less than ±0.005% of calibrated span per volt

Electromagnetic Compatibility (EMC)

All Models:

Meets all relevant requirements of IEC/EN 61326 and NAMUR NE-21.

Transient Protection (Option 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)

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 ⁽¹⁾

Range	Minimum Span 3051S_			Range and Sensor Limits 3051S_		
	Ultra and Ultra for Flow ⁽¹⁾	Classic	Upper (URL)	Lower (LRL)		
				3051S_CD ⁽²⁾	3051S_CG, LG ⁽³⁾	3051S_LD ⁽³⁾
0	0.1 inH ₂ O (0,25 mbar)	0.1 inH ₂ O (0,25 mbar)	3.0 inH ₂ O (7,5 mbar)	-3.0 inH ₂ O (-7,5 mbar)	NA	NA
1	0.5 inH ₂ O (1,24 mbar)	0.5 inH ₂ O (1,24 mbar)	25.0 inH ₂ O (62,3 mbar)	-25.0 inH ₂ O (-62,3 mbar)	-25.0 inH ₂ O (-62,3 mbar)	-25.0 inH ₂ O (-62,3 mbar)
2	1.3 inH ₂ O (3,11 mbar)	2.5 inH ₂ O (6,23 mbar)	250.0 inH ₂ O (0,62 bar)	-250.0 inH ₂ O (-0,62 bar)	-250.0 inH ₂ O (-0,62 bar)	-250.0 inH ₂ O (-0,62 bar)
3	5.0 inH ₂ O (12,4 mbar)	10.0 inH ₂ O (24,9 mbar)	1000.0 inH ₂ O (2,49 bar)	-1000.0 inH ₂ O (-2,49 bar)	-393.0 inH ₂ O (-979 mbar)	-1000.0 inH ₂ O (-2,49 bar)
4	1.5 psi (103,4 mbar)	3.0 psi (206,8 mbar)	300.0 psi (20,7 bar)	-300.0 psi (-20,7 bar)	-14.2 psig (-979 mbar)	-300.0 psi (-20,7 bar)
5	10.0 psi (689,5 mbar)	20.0 psi (1,38 bar)	2000.0 psi (137,9 bar)	-2000.0 psi (-137,9 bar)	-14.2 psig (-979 mbar)	-2000.0 psi (-137,9 bar)

- (1) Ultra for Flow applicable for CD Ranges 2 – 3 only.
- (2) Lower (LRL) is 0 inH₂O (0 mbar) for Ultra for Flow.
- (3) When specifying a 3051S_L Ultra, use Classic minimum span.

3051S_T Range and Sensor Limits					
Range	Minimum Span		Upper (URL)	Lower (LRL) (Abs.)	Lower ⁽¹⁾ (LRL) (Gage)
	Ultra	Classic			
1	0.3 psi (20,7 mbar)	0.3 psi (20,7 mbar)	30 psi (2,07 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
2	0.75 psi (51,7 mbar)	1.5 psi (0,103 bar)	150 psi (10,34 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
3	4 psi (275,8 mbar)	8 psi (0,55 bar)	800 psi (55,16 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
4	20 psi (1,38 bar)	40 psi (2,76 bar)	4000 psi (275,8 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)
5	1000 psi (68,9 bar)	2000 psi (137,9 bar)	10000 psi (689,5 bar)	0 psia (0 bar)	-14.7 psig (-1,01 bar)

- (1) Assumes atmospheric pressure of 14.7 psig.

3051S_CA, LA ⁽¹⁾ Range and Sensor Limits				
Range	Minimum Span		Upper (URL)	Lower (LRL)
	Ultra	Classic		
0 ⁽²⁾	0.167 psia (11,5 mbar)	0.167 psia (11,5 mbar)	5 psia (0,34 bar)	0 psia (0 bar)
1	0.3 psia (20,7 mbar)	0.3 psia (20,7 mbar)	30 psia (2,07 bar)	0 psia (0 bar)
2	0.75 psia (51,7 mbar)	1.5 psia (0,103 bar)	150 psia (10,34 bar)	0 psia (0 bar)
3	4 psia (275,8 mbar)	8 psia (0,55 bar)	800 psia (55,16 bar)	0 psia (0 bar)
4	20 psia (1,38 bar)	40 psia (2,76 bar)	4000 psia (275,8 bar)	0 psia (0 bar)

- (1) When specifying a 3051S_L Ultra, use Classic minimum span.
- (2) Range 0 is not available for 3051S_LA.

(1) For the 3051S SIS Safety Transmitter, rangedown is limited to 10:1 on all models with the exception of range 0. The 3051S2CD0 is limited to 2:1 rangedown, the 3051S2CA0 is limited to 5:1 rangedown.

Service

Liquid, gas, and vapor applications

4–20 mA/HART

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.

Standard transmitter (4–20 mA): 10.5 to 42.4 V dc with no load

3051S SIS Safety transmitter: 12 to 42 Vdc with no load

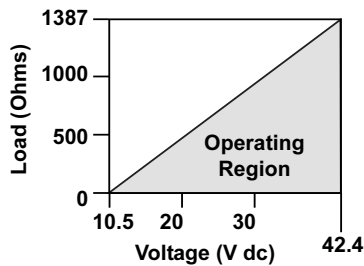
3051S HART Diagnostics transmitter: 12 to 42 Vdc with no load

Load Limitations

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

Standard Transmitter

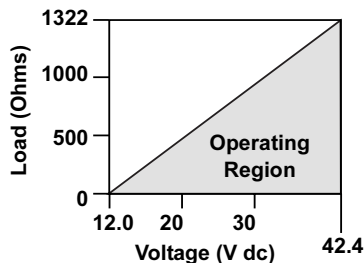
Maximum Loop Resistance = $43.5 * (\text{Power Supply Voltage} - 10.5)$



The HART communicator requires a minimum loop resistance of 250Ω for communication.

3051S SIS Safety Transmitter (output code B) 3051S HART Diagnostics Transmitter (option code DA1)

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



The HART communicator requires a minimum loop resistance of 250Ω for communication.

HART Diagnostics Suite (Option Code DA1)

The 3051S HART Diagnostics Transmitter provides Abnormal Situation Prevention (ASP) indication, device operating hours, variable logging, and enhanced EDDL graphic displays for easy visual analysis.

The integral statistical process monitoring (SPM) technology calculates the mean and standard deviation of the process variable 22 times per second and makes them available to the user. The 3051S ASP algorithm uses these values and highly flexible configuration options for customization to detect many user-defined or application specific abnormal situations (e.g. plugged impulse line detection).

The device operating hours are logged along with the occurrence of diagnostic events to enable quick troubleshooting of application and installation issues.

FOUNDATION fieldbus

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 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 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 feedforward. 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 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 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.

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	-
Transducer	-
LCD Block	-
Analog Input 1, 2	20 milliseconds
PID with Auto-tune	25 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 3095 Engineering Assistant.

FOUNDATION fieldbus Diagnostics Suite (Option Code D01)

3051S FOUNDATION fieldbus Diagnostics provide Abnormal Situation Prevention (ASP) indication and enhanced EDDL graphic displays for easy visual analysis.

The integral statistical process monitoring (SPM) technology calculates the mean and standard deviation of the process variable 22 times per second and makes them available to the user. The 3051S ASP algorithm uses these values and highly flexible configuration options for customization to detect many user-defined or application specific abnormal situations (e.g. plugged impulse line detection).

Overpressure Limits

Transmitters withstand the following limits without damage:

3051S_CD, CG

- Range 0: 750 psi (51,7 bar)
- Range 1: 2000 psig (137,9 bar)
- Ranges 2–5: 3626 psig (250,0 bar)
- 4500 psig (310,3 bar) for option code P9
- 6092 psig (420 bar) for option code P0 (3051S2CD only)

3051S_CA

- Range 0: 60 psia (4,13 bar)
- 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)

3051S_TG, 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)

3051S_LD, LG, LA

Limit is flange rating or sensor rating, whichever is lower (see the table below).

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
<i>At 100 °F (38 °C), the rating decreases with increasing temperature, per ANSI/ASME B16.5.</i>			
DIN	PN 10–40	40 bar	40 bar
DIN	PN 10/16	16 bar	16 bar
DIN	PN 25/40	40 bar	40 bar
<i>At 248 °F (120 °C), the rating decreases with increasing temperature, per DIN 2401.</i>			

Static Pressure Limit

3051S_CD Only

Operates within specifications between static line pressures of 0.5 psia and 3626 psig;

- 4500 psig (310,3 bar) for option code P9
- 6092 psig (420 bar) for option code P0 (3051S2CD only)
- Range 0: 0.5 psia to 750 psig (0,03 to 51,71 bar)
- Range 1: 0.5 psia to 2000 psig (0,03 to 137,90 bar)

Rosemount 3051S Series

Burst Pressure Limits

Coplanar or traditional process flange

- 10000 psig (689,5 bar).

3051S_T:

- Ranges 1–4: 11000 psi (758,4 bar)
- Range 5: 26000 psig (1792,64 bar)

Temperature Limits

Ambient

–40 to 185 °F (–40 to 85 °C)

With LCD display: –4 to 175 °F (–20 to 80 °C)

With option code P0: –4 to 185 °F (–20 to 85 °C)

Storage

–50 to 230 °F (–46 to 110 °C)

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

Process Temperature Limits

At atmospheric pressures and above.

3051S_C Coplanar

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⁾

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)⁽³⁾⁽⁴⁾

3051S_T In-Line (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⁾

3051S_L 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⁾

3051S_L High-Side Temperature Limits (Process Fill Fluid)

Syltherm[®] XLT –100 to 300 °F (–73 to 149 °C)

D.C.[®] Silicone 704⁽⁵⁾ 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 H₂O 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.

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

(3) 160 °F (71 °C) limit in vacuum service.

(4) Not available for 3051S_CA.

(5) Upper limit of 600 °F (315 °C) is available with 1199 seal assemblies mounted away from the transmitter with the use of capillaries and up to 500 °F (260 °C) with direct mount extension.

Humidity Limits

0–100% relative humidity

Turn-On Time

Performance within specifications less than 2 seconds (typical) after power is applied to the transmitter

Volumetric Displacement

Less than 0.005 in³ (0,08 cm³)

Damping

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.

Failure Mode Alarm

HART 4-20mA (output option codes A and B)

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 Table 1 below).

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

TABLE 1. Alarm Configuration

	High Alarm	Low Alarm
Default	≥ 21.75 mA	≤ 3.75 mA
NAMUR compliant ⁽¹⁾	≥ 22.5 mA	≤ 3.6 mA
Custom levels ^{(2) (3)}	20.2 - 23.0 mA	3.6 - 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) Not available with the 3051S SIS Safety Transmitter.

3051S SIS Safety Transmitter Failure Values

Safety accuracy: 2.0%⁽¹⁾

Safety response time: 1.5 seconds

(1) A 2% variation of the transmitter mA output is allowed before a safety trip. Trip values in the DCS or safety logic solver should be derated by 2%.

PHYSICAL SPECIFICATIONS

Electrical Connections

¹/₂–14 NPT, G¹/₂, and M20 × 1.5 (CM20) conduit. HART interface connections fixed to terminal block for Output code A.

Process Connections

3051S_C

¹/₄–18 NPT on 2¹/₈-in. centers

¹/₂–14 NPT and RC ¹/₂ on 2-in. (50.8mm), 2¹/₈-in. (54.0 mm), or 2¹/₄-in. (57.2mm) centers (process adapters)

3051S_T

¹/₂–14 NPT female,

Non-Threaded instrument flange (available in SST for Range 1–4 transmitters only),

G¹/₂ 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).

3051S_L

High pressure side: 2-in. (50.8mm), 3-in. (72 mm), or 4-in. (102mm), ASME B 16.5 (ANSI) Class 150, 300 or 600 flange; 50, 80 or 100 mm, DIN 2501 PN 40 or 10/16 flange

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

Process-Wetted Parts

Process Isolating Diaphragms

Isolating Diaphragm Material	3051S_				
	CD, CG	T	CA	L	
316L SST	•	•	•		See Below
<i>Hastelloy C-276</i> ®	•	•	•		
<i>Monel</i> 400	•		•		
Tantalum	•				
Gold-plated <i>Monel</i> 400	•		•		
Gold-plated 316L SST	•		•		

Drain/Vent Valves

316 SST, *Hastelloy C-276*, or *Monel* 400 material (*Monel* is not available with 3051S_L).

Process Flanges and Adapters

Plated carbon steel,
 CF-8M (Cast version of 316 SST, material per ASTM-A743),
 CW-12MW (Cast version of *Hastelloy C-276*, material per ASTM-A494),
 M-30C (Cast version of *Monel* 400, material per ASTM-A494).

Wetted O-rings

Glass-filled TFE
 (Graphite-filled TFE with Isolating Diaphragm code 6)

3051S_L Process Wetted Parts

Flanged Process Connection (Transmitter High Side)

Process Diaphragms, Including Process Gasket Surface
 316L SST, *Hastelloy C-276*, or Tantalum

Extension

CF-3M (Cast version of 316L SST, material per ASTM-A743), or CW-12MW (Cast version of *Hastelloy C*, material ASTM A494); fits schedule 40 and 80 pipe

Mounting Flange

Zinc-cobalt plated CS or 316 SST

Reference Process Connection (Transmitter Low Side)

Isolating Diaphragms

316L SST or *Hastelloy C-276*

Reference Flange and Adapter

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

Non-Wetted Parts

Electronics Housing

Low-copper aluminum or CF-3M (Cast version of 316L SST) NEMA 4X, IP 66, IP 68

Coplanar Sensor Module Housing

CF-3M (Cast version of 316L SST)

Bolts

Plated carbon steel per ASTM A449, Type 1

Austenitic 316 SST

ASTM A 453, Class A, Grade 660

ASTM A 193, Grade B7M

ASTM A 193, Class 2, Grade B8M

Monel

Sensor Module Fill Fluid

Silicone or inert halocarbon (Inert is not available with 3051S_CA). In-Line series uses Fluorinert® FC-43.

Process Fill Fluid (Liquid Level Only)

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

Paint

Polyurethane

Cover O-rings

Buna-N

Rosemount 3051S Series

Shipping Weights for 3051S

TABLE 2. SuperModule Platform weights

SuperModule Platform	Weight in lb. (kg)
Coplanar ⁽¹⁾	3.1 (1,4)
In-Line	1.4 (0,6)

(1) Flange and bolts not included.

TABLE 3. Transmitter weights without options

Complete Transmitter ⁽¹⁾	Add Weight In lb (kg)
3051S_C with junction box housing	6.9 (3,1)
3051S_T with junction box housing	3.3 (1,5)
3051S_C with PlantWeb housing	7.2 (3,3)
3051S_T with PlantWeb housing	3.6 (1,6)

(1) Fully functional transmitter with terminal block, covers, and SST flange.

TABLE 4. 3051S_L weights without options

Flange	Flush lb. (kg)	2-in. Ext. lb (kg)	4-in. Ext. lb (kg)	6-in. Ext. lb (kg)
2-in., 150	12.5 (5,7)	—	—	—
3-in., 150	17.5 (7,9)	19.5 (8,8)	20.5 (9,3)	21.5 (9,8)
4-in., 150	23.5 (10,7)	26.5 (12,0)	28.5 (12,9)	30.5 (13,8)
2-in., 300	17.5 (7,9)	—	—	—
3-in., 300	22.5 (10,2)	24.5 (11,1)	25.5 (11,6)	26.5 (12,0)
4-in., 300	32.5 (14,7)	35.5 (16,1)	37.5 (17,0)	39.5 (17,9)
2-in., 600	15.3 (6,9)	—	—	—
3-in., 600	25.2 (11,4)	27.2 (12,3)	28.2 (12,8)	29.2 (13,2)
DN 50 / PN 40	13.8 (6,2)	—	—	—
DN 80 / PN 40	19.5 (8,8)	21.5 (9,7)	22.5 (10,2)	23.5 (10,7)
DN 100 / PN 10/16	17.8 (8,1)	19.8 (9,0)	20.8 (9,5)	21.8 (9,9)
DN 100 / PN 40	23.2 (10,5)	25.2 (11,5)	26.2 (11,9)	27.2 (12,3)

TABLE 5. Transmitter option weights

Option Code	Option	Add lb (kg)
1J, 1K, 1L	SST PlantWeb housing	3.4 (1,5)
2J	SST Junction Box housing	3.3 (1,5)
7J	SST Quick Connect	0.35 (0,16)
2A, 2B, 2C	Aluminum Junction Box housing	1.2 (0,5)
1A, 1B, 1C	Aluminum PlantWeb housing	1.2 (0,5)
M5	LCD display for aluminum PlantWeb housing ⁽¹⁾ , LCD display for SST PlantWeb housing ⁽¹⁾	0.8 (0,4) 1.72 (0,8)
B4	SST mounting bracket for Coplanar flange	0.6 (0,3)
B1, B2, B3	Mounting Bracket for Traditional flange	2.3 (1,0)
B7, B8, B9	Mounting Bracket for Traditional flange with SST bolts	2.3 (1,0)
BA, BC	SST Bracket for Traditional flange	2.3 (1,0)
F12, F22	SST Traditional flange ⁽²⁾	3.3 (1,5)
F13, F23	Traditional flange (Hastelloy)	2.7 (1,2)
E12, E22	SST Coplanar flange ⁽²⁾	1.9 (0,9)
F14, F24	Traditional flange (Monel)	2.6 (1,2)
F15, F25	Traditional Flange (SST with Hastelloy D/V)	2.5 (1,1)
G21	Level flange—3 in., 150	10.8 (4,9)
G22	Level flange—3 in., 300	14.3 (6,5)
G11	Level flange—2 in., 150	10.7 (4,9)
G12	Level flange—2 in., 300	14.0 (6,4)
G31	DIN Level flange, SST, DN 50, PN 40	8.3 (3,8)
G41	DIN Level flange, SST, DN 80, PN 40	13.7 (6,2)

(1) Includes LCD display connector board and display cover

(2) Includes mounting bolts

Item	Weight In lb. (kg)
Aluminum standard cover	0.4 (0,2)
SST standard cover	1.26 (0,6)
Aluminum display cover	0.7 (0,3)
SST display cover	1.56 (0,7)
LCD display ⁽¹⁾	0.1 (0,1)
Junction Box terminal block	0.3 (0,1)
PlantWeb terminal block	0.2 (0,1)

(1) Display only