Product Data Sheet
December 2016
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Rosemount™ 2120 Level Switch

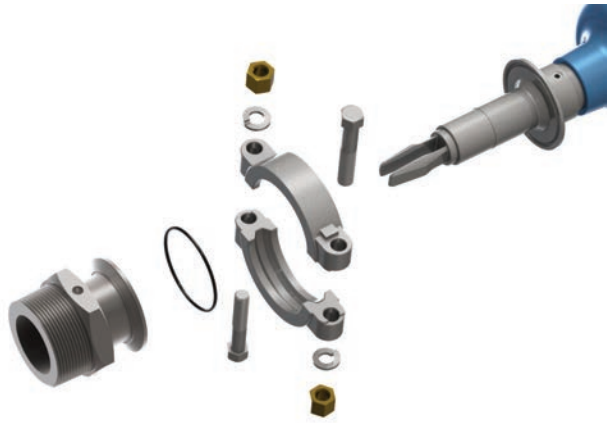
Vibrating Fork



- Designed for operation in process temperatures of –40 to 302 °F (–40 to 150 °C)
- Electronic self-checking and condition monitoring
- Increased safety, **SIL2**-certified to IEC 61508 as required by IEC 61511 and **SIL3** capable
- Adjustable switching delay for turbulent or splashing applications
- "Fast drip" fork design gives a quicker response time, especially with viscous liquids
- General area, explosion-proof/flameproof, and intrinsically safe options
- Hygienically approved to 3-A® and EHDEG, and complies with FDA and ASME-BPE

EMERSON™

Overview of the Rosemount 2120 Level Switch



The Quick Release kit is a new optional set of accessories. It makes inspection, proof-testing, and servicing easier than ever (see Table 2 on page 9 for accessories)



There is a variety of plug-in electronics options, with each having an adjustable mode and switching delay (see "Electrical connections" on page 12)



'Fast drip' forks

Measurement principle

The Rosemount 2120 is designed using the principle of a tuning fork. A piezo-electric crystal oscillates the forks at their natural frequency. Changes to this frequency are continuously monitored. The frequency of the vibrating fork sensor changes depending on the medium in which it is immersed. The denser the liquid, the lower the frequency.

When used as a **low level alarm**, the liquid in the tank or pipe drains down past the fork, causing a change of natural frequency that is detected by the electronics and switches the output state.

When the Rosemount 2120 is used as a **high level alarm**, the liquid rises in the tank or pipe, making contact with the fork which then causes the output state to switch.

Key features and benefits

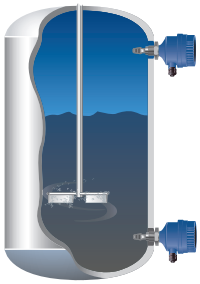
- Function virtually unaffected by flow, bubbles, turbulence, foam, vibration, solids content, coating products, liquid properties, and product variations
- The Rosemount 2120 is designed for operation in process temperatures from –40 to 302 °F (–40 to 150 °C)
- A 'heartbeat' LED indicates its operating state. The LED also flashes when the switch output is 'off' and is constantly lit when 'on'
- Adjustable switching delay prevents false switching in turbulent or splashing applications
- 'Fast drip' fork design gives quicker response time, especially with viscous liquids. Rapid wet-to-dry and dry-to-wet time setting for highly responsive switching
- Fork shape is optimized for polishing to meet hygienic requirements. Mechanical- and electro-polishing options.
- Magnetic test point makes functional test easy
- No moving parts or crevices for virtually no maintenance

Contents

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Fit and forget

- Once installed, the Rosemount 2120 is ready to go.
  It needs no calibration and requires minimum installation
- The 'heartbeat' LED gives an instant visual indication that the unit is operational
- Functional testing of the instrument and system is easy with a magnetic test point
- You can install, and forget it



High and low level alarm

Superior performance

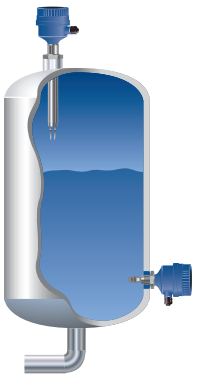
- The Rosemount 2120 is a popular choice for high and low level alarm and pump control duties for its simplicity, ease of use, and reliability
- Functionality is virtually unaffected by flow, turbulence, bubbles, foam, or vibration
- The 'fast drip' design allows the liquid to be quickly drawn away from the fork tip when mounted horizontally, making the Rosemount 2120 quicker and more responsive in high density or viscous liquid applications
- With a user-selectable time delay feature, the risk of false switching is minimized in turbulent or splashing applications



High-temperature applications

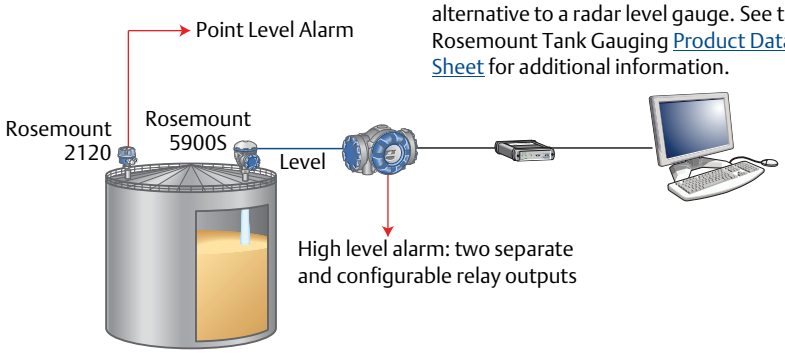
Applications

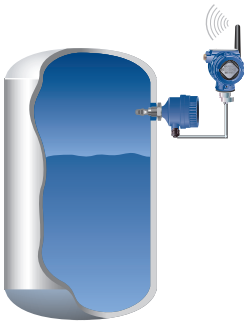
- Overfill protection
- High and low point level alarms
- Pump control or limit detection
- Run dry or pump protection
- Hygienic applications
- High-temperature applications
- Wireless applications



Pump control / limit detection

In tank gauging systems, a Rosemount 2120 high level alarm switch can be used as an alternative to a radar level gauge. See the Rosemount Tank Gauging Product Data Sheet for additional information.





Wireless applications using a Rosemount 702 Discrete Transmitter

Ordering Information

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 10 for more information on Material Selection.

Table 1. Rosemount 2120 Ordering Information

The starred options (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Model	Product description	
2120	Vibrating Fork Liquid Level Switch / –40...302 °F (–40...150 °C)	
Materials of construction: process connection/fork		
D	316/316L Stainless Steel (1.4401/1.4404) dual certified	★
F[(1)]	ECTFE copolymer, coated 316/316L SST (1.4401/1.4404)	
C	Alloy C (UNS N10002), Alloy C-276 (UNS N10276), Solid	
Process connection size / type		
0A	3/4-in. BSPT (R) Thread	★
0B	3/4-in. BSPP (G) Thread	★
0D	3/4-in. NPT Thread	★
1A	1-in. BSPT (R) Thread	★
1B	1-in. BSPP (G) Thread	★
1D	1-in. NPT Thread	★
1P	1-in. BSPP (G), O-ring	★
5R	1 1/2-in. (38 mm) Tri Clamp	★
2R	2-in. (51 mm) Tri Clamp	★
1G	1-in. ASME B16.5 Class 150 Raised Face (RF) Flange	★
1H	1-in. ASME B16.5 Class 300 Raised Face (RF) Flange	★
1J	1-in. ASME B16.5 Class 600 Raised Face (RF) Flange	★
5G	1 1/2-in. ASME B16.5 Class 150 Raised Face (RF) Flange	★
5H	1 1/2-in. ASME B16.5 Class 300 Raised Face (RF) Flange	★
2G	2-in. ASME B16.5 Class 150 Raised Face (RF) Flange	★
2H	2-in. ASME B16.5 Class 300 Raised Face (RF) Flange	★
3G	3-in. ASME B16.5 Class 150 Raised Face (RF) Flange	★
3H	3-in. ASME B16.5 Class 300 Raised Face (RF) Flange	★
4G	4-in. ASME B16.5 Class 150 Raised Face (RF) Flange	★
4H	4-in. ASME B16.5 Class 300 Raised Face (RF) Flange	★
1K	DN25, EN1092 PN 10/16 Flange	★
1L	DN25, EN1092 PN 25/40 Flange	★
1M	DN25, EN1092 PN 63 Flange	★
1N	DN25, EN1092 PN 100 Flange	★
5K	DN40, EN1092 PN 10/16 Flange	★
5L	DN40, EN1092 PN 25/40 Flange	★

Table 1. Rosemount 2120 Ordering Information

The starred options (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

2K	DN50, EN1092 PN 10/16 Flange	★
2L	DN50, EN1092 PN 25/40 Flange	★
7K	DN65, EN1092 PN 10/16 Flange	★
7L	DN65, EN1092 PN 25/40 Flange	★
3K	DN80, EN1092 PN 10/16 Flange	★
3L	DN80, EN1092 PN 25/40 Flange	★
4K	DN100, EN1092 PN 10/16 Flange	★
4L	DN100, EN1092 PN 25/40 Flange	★
5J	$1^1/_2$-in. ASME B16.5 Class 600 Raised Face (RF) Flange	
2J	2-in. ASME B16.5 Class 600 Raised Face (RF) Flange	
3J	3-in. ASME B16.5 Class 600 Raised Face (RF) Flange	
4J	4-in. ASME B16.5 Class 600 Raised Face (RF) Flange	
5M	DN40, EN1092 PN 63 Flange	
5N	DN40, EN1092 PN 100 Flange	
2M	DN50, EN1092 PN 63 Flange	
2N	DN50, EN1092 PN 100 Flange	
7M	DN65, EN1092 PN 63 Flange	
7N	DN65, EN1092 PN 100 Flange	
3M	DN80, EN1092 PN 63 Flange	
3N	DN80, EN1092 PN 100 Flange	
4M	DN100, EN1092 PN 63 Flange	
4N	DN100, EN1092 PN 100 Flange	
SA	25A, 10K, JIS B2220 Flange	
SB	25A, 20K, JIS B2220 Flange	
TA	40A, 10K, JIS B2220 Flange	
TB	40A, 20K, JIS B2220 Flange	
UA	50A, 10K, JIS B2220 Flange	
UB	50A, 20K, JIS B2220 Flange	
VA	80A, 10K, JIS B2220 Flange	
VB	80A, 20K, JIS B2220 Flange	
ZA	100A, 10K, JIS B2220 Flange	
ZB	100A, 20K, JIS B2220 Flange	
XX[(2)]	Customer Specific	

Table 1. Rosemount 2120 Ordering Information

The starred options (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Electronic type		**Available certifications**		
T	Direct load switching (Mains 2-wire) 20 to 264 Vac 50/60Hz, 20 to 60 Vdc	NA, E1, E5, E6, E7, EM, G5, G6		★
G	PNP/PLC (3-wire) 20 to 60 Vdc	NA, E1, E5, E6, E7, EM, G5, G6		★
V	Relay DPCO, 20 to 264 Vac 50/60Hz, 20 to 60 Vdc	NA, E1, E5, E6, E7, EM, G5, G6		★
E	Relay DPCO, 9...30 Vdc	E5 and G5		★
K	NAMUR	All		★
H	8/16 mA	All		★
Surface finish		**Available connections**	**Available housings**	
1	Standard surface finish	All	All	★
2[3]	Hand polished (Ra < 0.4 µm)	Tri Clamp only	All	★
3[4]	Ra < 0.76 µm, hygienically approved	Tri Clamp only	A, D, X, Y	★
4[4]	Electro-polished to ≤ 0.76 µm, hygienically approved	Tri Clamp only	A, D, X, Y	★
7[4]	Mechanically-polished to Ra < 0.1 µm, hygienically approved	Tri Clamp only	A, D, X, Y	★
8[4]	Electro-polished to Ra < 0.38 µm, hygienically approved	Tri Clamp only	A, D, X, Y	★
Product certifications		**Electronic types allowed**	**Available housings**	
NA[5]	No Hazardous Locations Certifications	All except option E	All	★
G5[6]	FM Ordinary Locations (unclassified, safe area)	All	Y, T	★
G6[7]	CSA Ordinary Locations (unclassified, safe area)	All except option E	Y, T	★
E1	ATEX Flameproof	All except option E	X, S	★
E5[6]	FM Explosion-proof	All	Y, T	★
E6[7]	CSA Explosion-proof	All except option E	Y, T	★
E7	IECEx Explosion-proof	All except option E	X, S	★
EM	Technical Regulation Customs Union (EAC), Flameproof	All except option E	X, S	★
I1	ATEX Intrinsic Safety	K, H	All	★
I5	FM Intrinsic Safety	K, H	All	★
I6	CSA Intrinsically Safe	K, H	All	★
I7	IECEx Intrinsic Safety	K, H	All	★
IM	Technical Regulation Customs Union (EAC), Intrinsic. Safe	K, H	All	★
Housing		**Available certifications**		
A	Glass Filled Nylon, M20 conduits/cable threads	NA, I1, I5, I6, and I7		★
D	Glass Filled Nylon, 1/2-in. ANPT conduits/cable threads	NA, I1, I5, I6, and I7		★
X	Aluminum Alloy, M20 conduits/cable threads	All except G5, G6, E5, E6		★
Y	Aluminum Alloy, 3/4-in. ANPT conduits/cable threads	All except E1, E7, and EM		★
S	Stainless Steel, M20 conduits/cable threads	All except G5, G6, E5, E6		★
T	Stainless Steel 3/4-in. ANPT conduits/cable threads	All except E1, E7, and EM		★

Table 1. Rosemount 2120 Ordering Information

The starred options (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Fork length		**Available connection**	
A	Standard length 1.7 in. (44 mm)	All except flanged options	★
H[8]	Standard length flange 4.0 in. (102 mm)	All flanged options	★
E[9]	Extended, customer specified length in tenths of inches	All except 1-in. BSPP O-ring (1P)	★
M[9]	Extended, customer specified length in millimeters	All except 1-in. BSPP O-ring (1P)	★
Specific extended fork length			
0000	Factory default length (only if Fork Length A or H is selected)		★
XXXX[9]	Specific customer specified length in tenths of inches or millimeters (XXX.X inches or XXXX mm)		★
Typical Model Number: 2120 D 0A K 1 I1 A 0000			

Options (include with the selected model number)

Calibration data certification		
Q4	Certificate of functional test	★
Material traceability certification[8][10]		
Q8	Material traceability certification per EN 10204 3.1	★
Material certification[8][10]		
Q15	NACE® MR0175 / ISO 15156	★
Q25	NACE MR0103	★
Safety certification[11]		
QS	Prior-use certificate of FMEDA Data	★
QT	Safety certificate to IEC61508	★
Special procedures[12]		
P1	Hydrostatic testing with certificate	★
Hygienic certifications[13]		
QA	3-A certificate	★
QE	EHEDG certificate	★
ASME-BPE statement[13]		
QB	ASME-BPE statement	★
Food Drug Administration statement[13]		
QH	FDA statement	★
Surface finish certification[13]		
Q16	Surface finish certificate	★
Example of options included with the model number: 2120 D 0A K 1 I1 A 0000 Q8		

1. ECTFE copolymer coating is only available for a flanged Rosemount 2120 but excludes 1-in./DN25/25A flanges. Flanges are dual certified 316 and 316L Stainless Steel (1.4401 and 1.4404).

2. Other process connections available upon request.
3. Hand-polished for hygienic connections to better than 0.4 µm Ra such that there are no pits, folds, crevices or cracks discernible to the naked eye (i.e. no features larger than 75 micrometers based on resolving 1/60 degree at a distance of 250 mm).
4. Not available for explosion-proof or flameproof product certifications.
5. Includes the Technical Regulation Customs Union (EAC) ordinary location mark.
6. See "Product Certifications" on page 14. E5 includes G5 requirements. G5 is for use in unclassified, safe area locations only.
7. See "Product Certifications" on page 14. E6 includes G6 requirements. G6 is for use in unclassified, safe area locations only.
8. Not available for hand polished wet side.
9. Minimum length available for 3/4-in. threaded connection is 3.8 in. (95 mm); for 1-in. threaded, it is 3.7 in. (94 mm); for flanged, it is 3.5 in. (89 mm); and for Tri Clamp, it is 4.1 in. (105 mm). Maximum length is 157.5 in. (4000 mm), except for ECTFE copolymer coating and polished process where the maximum length is 59.1 in. (1500 mm) and 39.4 in. (1000 mm) respectively. Examples: Code E1181 is 118.1 inches. Code M3000 is 3000 millimeters.
10. Only available for process-wetted parts.
11. Not available for Direct Load switching electronics.
12. Option limited to units with extended lengths up to 59.1-in. (1500 mm). Option is not available for ECTFE coating.
13. Available only for a Rosemount 2120 with a Tri Clamp fitting, Product Certification code NA, G*, or I*, and Surface Finish code 3, 4, 7, or 8.

Safety Integrity Level (SIL) certification option

- The Rosemount 2120 is SIL2-certified and SIL3 capable for all electronics except the Direct Load option.
- The Rosemount 2120 has been independently certified to IEC 61508 as required by IEC 61511. Certification was conducted by Exida. If required, add "**QT**" to the end of the model code. For example, 2120 D 0A K E1 X A0000 **QT**. (Note that you can have one or more OPTIONS codes at the end).
- Visit the Rosemount 2120 web page for additional information.

Overfill approval option

- The Rosemount 2120 has been TÜV-tested and approved for overfill protection according to the German DIBt/WHG regulations. This option is not selectable in the ordering information table. If required, add "R2259" to the end of the model code. For example, 2120 D 0A K E1 X A0000 **R2259**. (Note that you can have one or more OPTIONS codes at the end).

Spare Parts and Accessories

Table 2. Spare Parts and Accessories

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 10 for more information on Material Selection.

Spares and accessories[1][2]		
02100-1000-0001	Seal for 1-in. BSPP (G1A). Material: Non-asbestos BS7531 grade X carbon fiber with rubber binder	★
02100-1040-0001	Seal for 3/4-in. BSPP (G3/4A). Material: Non-asbestos BS7531 grade X carbon fiber with rubber binder	★
02100-1010-0001	Adaptor boss 1-in. BSPP to 1 1/2-in. (38mm) Tri-Clamp. Material: 316 SST fitting. FPM/FKM O-ring	★
02100-1020-0001[3]	2-in. (51 mm) Tri Clamp kit (vessel fitting, clamp ring, and seal). Material: 316 SST, NBR Nitrile	★
02100-1030-0001	Telescopic test magnet	★
02120-2000-0001[4]	1 1/2-in. BSPP adjustable 316 SST clamp gland for 1-in. extended lengths. Silicone (Si) rubber seal	★
02120-2000-0002[4]	1 1/2-in. NPT adjustable 316 SST clamp gland for 1-in. extended lengths. Silicone (Si) rubber seal	★
02120-7000-0001[5]	Replacement Cassette: Direct load switching (2 Wire) (Red)	★
02120-7000-0002[5]	Replacement Cassette: PNP/PLC, 20 to 60 Vdc (Yellow)	★
02120-7000-0003[5]	Replacement Cassette: NAMUR (Light Blue)	★
02120-7000-0004[5]	Replacement Cassette: Relay (DPCO), standard version (Green)	★
02120-7000-0005[5]	Replacement Cassette: 8/16 mA output (Dark Blue)	★
02120-7000-0007[5]	Replacement Cassette: Relay (DPCO), 9...30 Vdc (12 Vdc nominal) version (Green)	★
02100-1060-0001[3][6]	Quick Release kit (contains 2-in. Tri Clamp, seal, and quick release device for 2-in. NPT process connection)	

1. Check the Electronic Type and Product Certification sections in Table 1 on page 4 for availability conditions.
2. Intrinsically Safe (IS) approved cassettes can only be replaced with the same type of IS cassette. Non-IS cassette types can be interchanged with other non-IS cassettes, but the new label must be fitted and the original part number transferred to the new label.
3. This is not approved to be used with a 3-A or EHEDG approved products and is not assessed for use with FDA or ASME-BPE compliant products.
4. The adjustable clamp gland is not explosion-proof.
5. This replacement cassette is for versions of the Rosemount 2120 shipped since June 2013.
6. The Quick Release kit is a set of accessories requiring a Rosemount 2120 with the 2-in. Tri Clamp option and an existing 2-in. NPT process connection on the vessel. For additional information, see Rosemount 2120 Quick Release kit – Quick Start Guide.

Specifications

General

Product

Rosemount 2120 Level Switch

Measuring principle

Vibrating fork technology

Applications

Most liquids including coating liquids, aerated liquids, and slurries.

Mechanical

Housing / Enclosure

Table 3. Housing / Enclosure Specifications

Housing code	A	D	X	Y	S	T
Housing material	Nylon PA66 30%GF		Al alloy ASTM B85 A360.0		316C12 SST	
Rotational	Yes		No		No	
Housing paint	Not applicable		Polyurethane paint		Not applicable	
LED window	Nylon PA12		None		None	
Conduit entry	M20	1/2-in. ANPT	M20	3/4-in. ANPT	M20	3/4-in. ANPT
Ingress protection	IP66/67 to EN60529		IP66/67 to EN60529, NEMA® 4X		IP66/67 to EN60529, NEMA 4X	

Connections

Threaded, Tri Clamp, and flanged process connections.
See "Process connection size / type" on page 4 for a full list.

Extended lengths

The maximum extended length is 157.5 in. (4000 mm) except for ECTFE copolymer coating and mechanically-polished process connection options which have a maximum length of 59.1 in. (1500 mm) and 39.4 in. (1000 mm) respectively.

Table 4. Minimum Extended Lengths

Process connection	Minimum extended length
3/4–in. threaded	3.8 in. (95 mm)
1–in. threaded	3.7 in. (94 mm)
Flanged	3.5 in. (89 mm)
Tri Clamp	4.1 in. (105 mm)

Dimensional drawings

See "Dimensional Drawings" on page 16.

Material selection

Emerson provides a variety of Rosemount product with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options and components for the particular application.

Emerson is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.

Process connection materials

316/316L stainless steel (1.4401/1.4404 dual certified).

Alloy C (UNS N10002) and Alloy C-276 (UNS N10276) – available for flanged, and BSPT and NPT threaded process connections (3/4- and 1-in. BSPT (R), and 3/4- and 1-in. NPT).

ECTFE co-polymer coated 316/316L Stainless Steel (1.4401/1.4404 dual certified) – only available for a flanged Rosemount 2120 but excludes 1-in./DN25/25A flanges.

Gasket material for 3/4- and 1-in. BSPP (G) is non-asbestos BS7531 Grade X carbon fiber with rubber binder.

Functional

Maximum operating altitude

6562 ft. (2000 m)

Maximum operating pressure

The final rating depends on the selected process connection.

- Threaded connection: see Figure 1 for operating pressures

  Clamp glands 02120-2000-0001 and 02120-2000-0002 (page 9) limit the maximum pressure to 18.85 psig (1.3 bar g).
- Tri Clamp connection: 435 psig (30 bar g).
- Flanged connection:
  See Figure 1 or Table 5 (whichever gives the lowest pressure).

Figure 1. Process Pressure

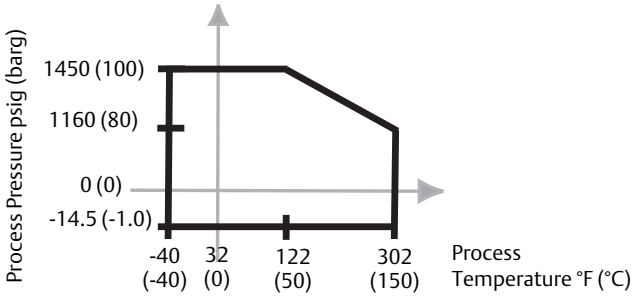


Figure 2. Operating Temperatures

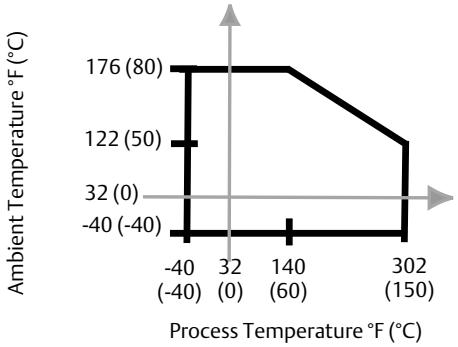


Table 5. Maximum Flange Pressure Rating

Standard	Class/Rating	SST flanges
ASME B16.5	Class 150	275 psig(1)
ASME B16.5	Class 300	720 psig(1)
ASME B16.5	Class 600	1440 psig(1)
EN1092-1	PN 10/16	16 barg(2)
EN1092-1	PN 25/40	40 barg(2)
EN1092-1	PN 63	63 barg(2)
EN1092-1	PN 100	100 barg(2)
JIS B2220	10K	14 barg(3)
JIS B2220	20K	34 barg(3)

1. At 100 °F (38 °C), the rating decreases with an increasing process temperature.
2. At 122 °F (50 °C), the rating decreases with an increasing process temperature.
3. At 248 °F (120 °C), the rating decreases with an increasing process temperature.

Minimum and maximum operating temperatures

See Figure 2 for operating temperatures.

Clamp glands 02120-2000-0001 and 02120-2000-0002 (page 9) limit the maximum temperature to 257 °F (125 °C).

The ambient temperature for a 8/16 mA cassette is limited to 158 °F (70 °C) in dust applications.

Liquid density requirement

Minimum of 37.5 lb/ft^3 (600 kg/m^3).

Liquid viscosity range

Up to 10000 cP (centiPose).

Solids content and coating

Maximum recommended diameter of solid particles in the liquid is 0.2 in. (5 mm).

For a coating product, avoid bridging of forks.

Switching delay

User selectable 0.3, 1, 3, 10, 30 seconds delay for dry-to-wet and wet-to-dry switching.

Clean-In-Place (CIP) cleaning

Withstands cleaning routines up to 160 °F (71 °C).

Steam-In-Place (SIP) cleaning

Withstands cleaning routines up to 275 °F (135 °C).

NACE

NACE compliance to MR0175 / ISO 15156 or MR0103, depending on the option code selected for the model number.

Safety integrity level

The Rosemount 2120 FMEDA is certified for SIL2, and is SIL3 capable, for all electronics except the Direct Load option. Visit the Rosemount 2120 web page for additional information.

Performance

Hysteresis (water)

±0.039-in. (±1 mm) nominal.

Switching point (water)

0.5 in. (13 mm) from tip (vertical) / from edge (horizontal) of fork (this will vary with different liquid densities).

Electrical

Switching mode

User selectable switching mode (Dry=on or Wet=on).

Protection

Polarity insensitive
– on Relay (except 12 Vdc version) and Direct Load electronics

Over-current protection
– on Direct Load and PNP/PLC electronics

Short-circuit protection
– on Direct Load and PNP/PLC electronics

Load-missing protection
– on Direct Load and PNP/PLC electronics

Surge protection (to IEC61326)
– available on all versions of the Rosemount 2120

Heartbeat LED

The Rosemount 2120 has a status-indicating 'heartbeat' LED, which can be seen at all times and from all angles through a lens in the cover (no lens in metal housings).

The LED flashes when the output is 'off' and is constantly lit when it is 'on'. The LED gives a constant indication that the Rosemount 2120 is functioning correctly (different flash rates are used to indicate a product malfunction) and gives a local indication of the process state.

Magnetic test point

A magnetic test point is located on the side of the housing, allowing a functional test of the Rosemount 2120 and a system connected to it. By holding a magnet to the target, the output changes state for as long as the magnet is held there.

Terminal connection (wire diameter)

Minimum 26 AWG, Maximum 14 AWG (0.13 to 2.5 mm^2). Note national regulations.

Grounding

The Rosemount 2120 must always be grounded either through the terminals or using the external ground connection provided.

Conduit plugs/cable gland

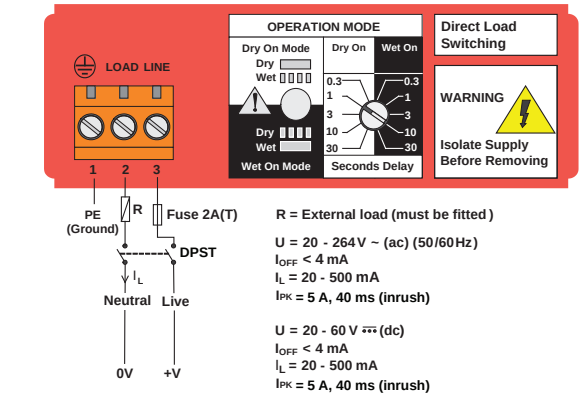
Metal housing:
Conduit entries for explosion-proof areas are shipped with one Exd plug (loose in bag) and two dust caps fitted. Use suitably rated cable glands. Unused conduit entries must be sealed with a suitably rated blanking plug.

Glass-filled nylon housing with direct load, PNP/PLC and IS electronics are shipped with one PA66[(1)] cable gland and one blanking plug.

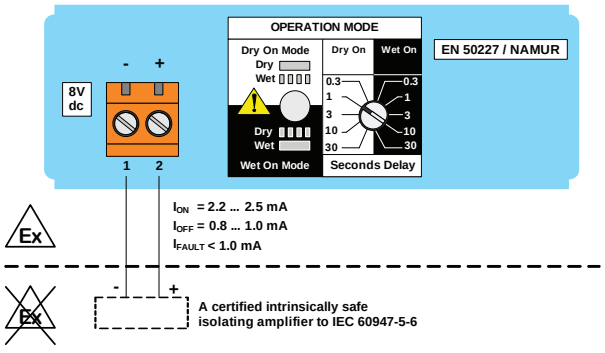
Glass-filled nylon housing with relay electronics are shipped with two PA66[(1)] cable glands.

Electrical connections

- Direct load switching (mains two wire) cassette

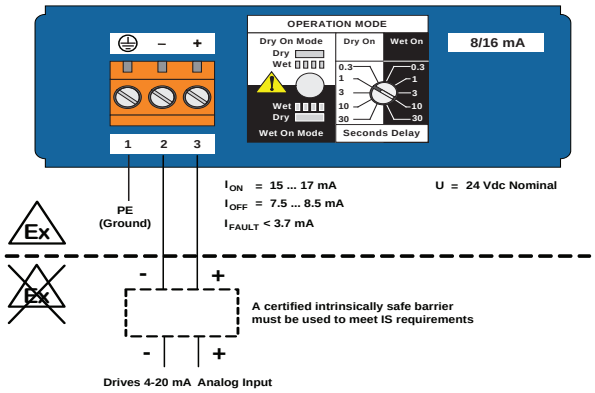


- NAMUR (light blue) cassette

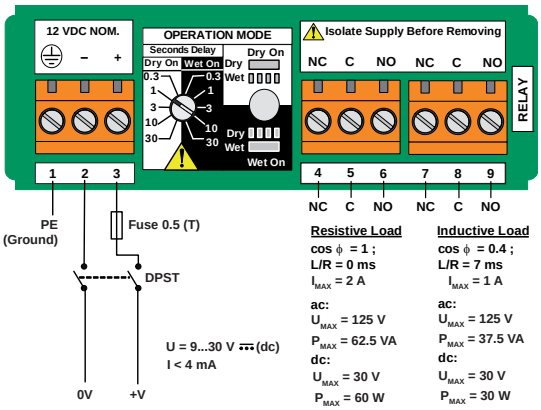


1. Cable diameter 0.2 to 0.3 in. (5 to 8 mm)

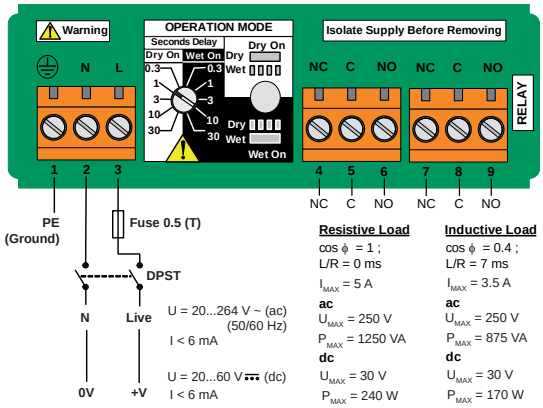
■ 8/16 mA (dark blue) cassette



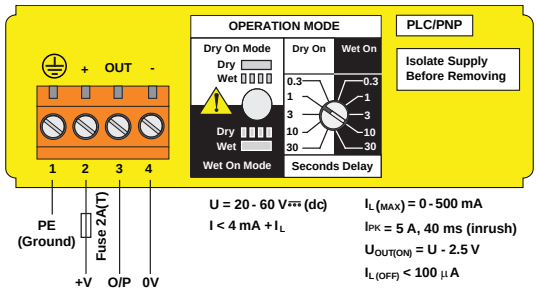
■ DPCO dual relay cassette (12 Vdc nominal version)



■ DPCO dual relay cassette (standard version)



■ Solid state PNP output for direct interface to a PLC



Note

The external DPST switch that is shown in the wiring diagrams is an optional local disconnect (customer supplied).

Product Certifications

European directive information

The EC declaration of conformity for all applicable European directives for this product can be found at Emerson.com/Rosemount

NAMUR approval

NAMUR NE95 type test report is available upon request. Complies with NAMUR NE21.

Overfill approval

Certificate: Z-65.11-522

TÜV-tested and approved for overfill protection according to the German DIBt/WHG regulations. Certified under safety devices for tanks and piping related to water pollution control.

Hygienic approvals and compliances (surface finish codes 3, 4, 7, and 8)

3-A Authorization 3496

EHEDG Certificate: 102016

ASME-BPE and **FDA** compliant.

Drinking water approval

Rosemount Measurement Limited, Slough, UK confirms that the wetted parts of the Rosemount type 2120 vibrating level switches are suitable and approved for use in potable water.

The wetted parts of the vibrating level switches executed in:

Stainless steel (option code D) and Alloy C / Alloy C-276 (option code C) with Flanged, NPT thread, BSPT(R) thread, or Tri Clamp process connections, are in accordance with the requirements of DVGW - Worksheet W270.The materials used are classified as toxicologically and microbiologically safe.

Marine approvals

ABS American Bureau of Shipping

GL Germanischer Lloyd

SRS Russian Maritime Registered Shipping (RMRS)

Ordinary location certification for FM

G5 Project ID: 3021776

The switch 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)

Ordinary location certification for CSA

G6 Certificate Number: 06 CSA 1805769

The switch has been examined and tested to determine that the design meets basic electrical, mechanical, and fire protection requirements by CSA, a nationally recognized testing laboratory as accredited by the Standards Council of Canada (SCC). Single process seal.

Safety Integrity Level (SIL) certification

The Rosemount 2120 is SIL2-certified, and is also SIL3 capable. It has been independently certified to IEC 61508 as required by IEC 61511. Certification was conducted by Exida.
If required, add "**QT**" to the end of the model code.
For example, 2120 D 0A K E1 X A0000 **QT**.

(This option is not available for the Direct Load electronics).

Canadian Registration Number

CRN 0F04227.2C

The requirements of CRN are met when a Rosemount 2120 CSA-approved vibrating fork level switch model is configured with 316/316L stainless steel (1.4401/1.4404) process-wetted parts and either NPT threaded or 2 to 8-in. ASME B16.5 flanged process connections.

Hazardous locations certifications

Note
A certified isolating amplifier or barrier must be used for intrinsic safety.

North American approvals

Factory Mutual (FM) explosion-proof approval

E5 Project ID: 3012658
Explosion-proof for Class I, Div. 1, Groups A, B, C, and D
Temperature Class: T6 (T_{amb} –40 to 75 °C)
Enclosure: Type 4X

Factory Mutual (FM)
intrinsically safe approval and non-incendive

I5 Project ID: 3011456
Intrinsically Safe for Class I, Div. 1, Groups A, B, C, and D
Class I, Zone 0, AEx ia IIC
Non-incendive for Class I, Div. 2, Groups A, B, C, and D
Class I, Zone 2, IIC
Temperature Code: T5 (T_{amb} –40 to 80 °C, Tproc < 80 °C)
Control Drawing: 71097/1154 (with NAMUR electronics)
Control Drawing: 71097/1314 (with 8/16 mA electronics)

Canadian approvals

Canadian Standards Association (CSA) explosion-proof

E6 Project ID: 1786345
Explosion-proof for Class I, Div. 1, Groups A, B, C, and D
Temperature Class: T6 (T_{amb} –40 to 75 °C)
Enclosure: Type 4X
Single process seal

Canadian Standards Association (CSA)
intrinsically safe and non-incendive

I6 Certificate Number: 06 CSA 1786345
Intrinsically Safe for Class I, Div. 1, Groups A, B, C, and D
Class 1, Zone 0, Ex ia IIC
Non-Incendive for Class I, Div. 2, Groups A, B, C, and D
Temperature Code: T5 (T_{amb} –40 to 80 °C, Tproc < 80 °C)
Control Drawing: 71097/1179 (with NAMUR electronics)
Control Drawing: 71097/1315 (with 8/16 mA electronics)
Single process seal

European approvals

ATEX flameproof and dust-proof approval

E1 Certificate: Sira 05ATEX1129X
Flameproof and dust-proof:
ATEX Marking ⟨Ex⟩ II 1/2 GD
Ex db IIC T6...T2 Ga/Gb
Ex tb IIIC T85 °C...T265 °C Db

ATEX intrinsically safe approval

I1 Certificate: Sira 05ATEX2130X
Intrinsic Safety for gas and dust environments:
ATEX Marking ⟨Ex⟩ II 1 GD
Ex ia IIC T5...T2 Ga
Ex ia IIIC T85 °C...T265 °C Da

International approvals

International Electrotechnical Commission (IEC)
flameproof and dust-proof approval

E7 Certificate: IECEx SIR 06.0051X
Flameproof and dust-proof:
Ex db IIC T6...T2 Ga/Gb
Ex tb IIIC T85°C...T265°C Db

International Electrotechnical Commission (IEC)
intrinsically safe approval

I7 Certificate: IECEx SIR 06.0070X
Intrinsically Safe for gas and dust environments:
Ex ia IIC T5...T2 Ga
Ex ia IIIC T85 °C...T265 °C Da

Technical Regulation Customs Union (EAC) approvals

EM Certificate: TC RU C-GB.BH02.B.00175

Flameproof:
1Exd IIC T6...T3 X
Ta (see table in the certificate)

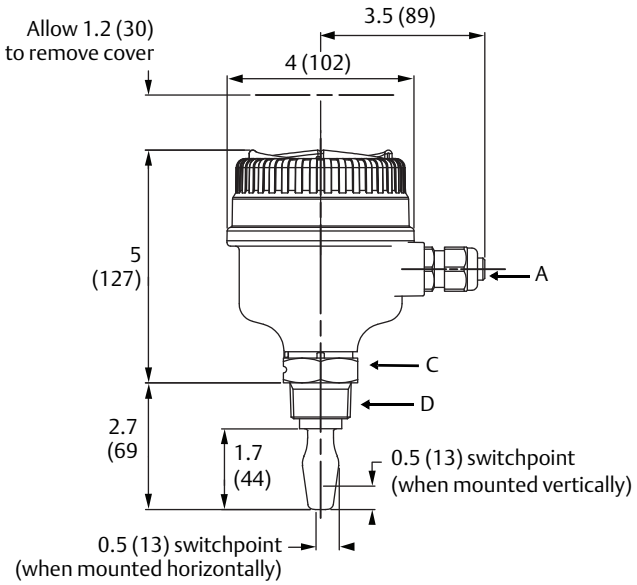
IM Certificate: TC RU C-GB.BH02.B.00175

Intrinsic Safety:
0Exia IIC T5...T3 X
Ta (see table in the certificate)

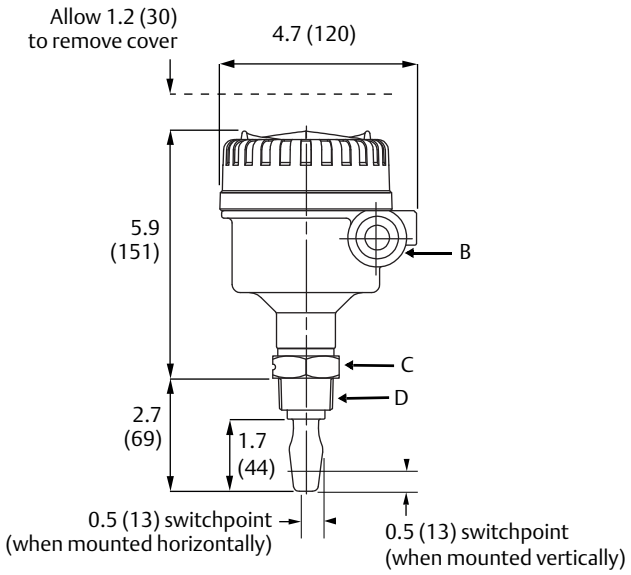
Dimensional Drawings

Figure 3. 3/4- and 1-in. Threaded Mounting (Standard Length)

Glass-filled nylon housing



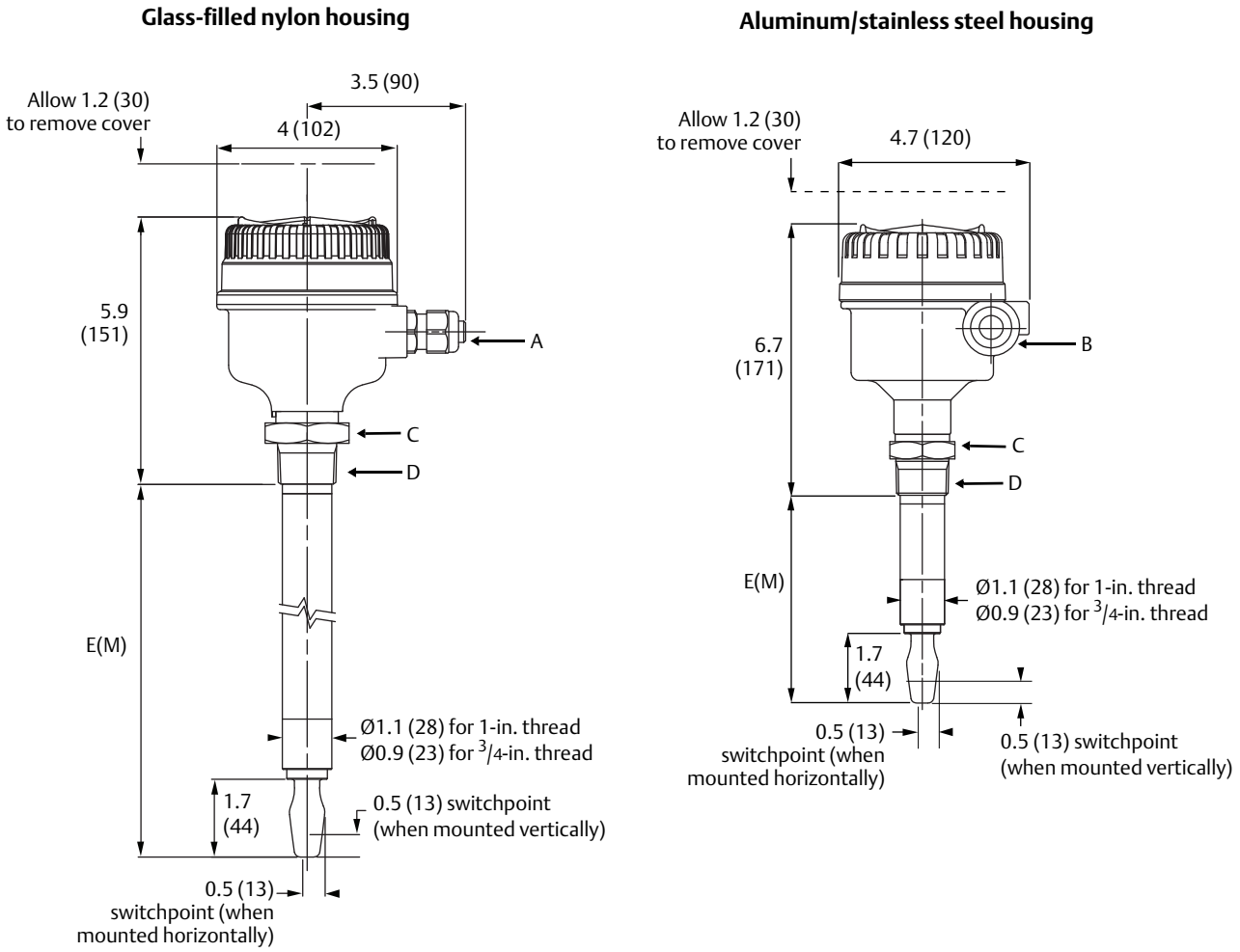
Aluminum/stainless steel housing



A. Cable entry M20 x 1.5 or 1/2-in. ANPT
B. Cable entry M20 x 1.5 or 3/4-in. ANPT
C. 1.6 (40) A/F hexagon
D. 3/4- or 1-in. thread

Dimensions are in inches (millimeters). See the Rosemount 2120 web page for all 1-in. BSPP threaded dimension drawings.

Figure 4. 3/4- and 1-in. Thread Mounting (Extended Length)



A. Cable entry M20 x 1.5 or 1/2-in. ANPT
B. Cable entry M20 x 1.5 or 3/4-in. ANPT
C. 1.6 (40) A/F hexagon
D. 3/4- or 1-in. thread

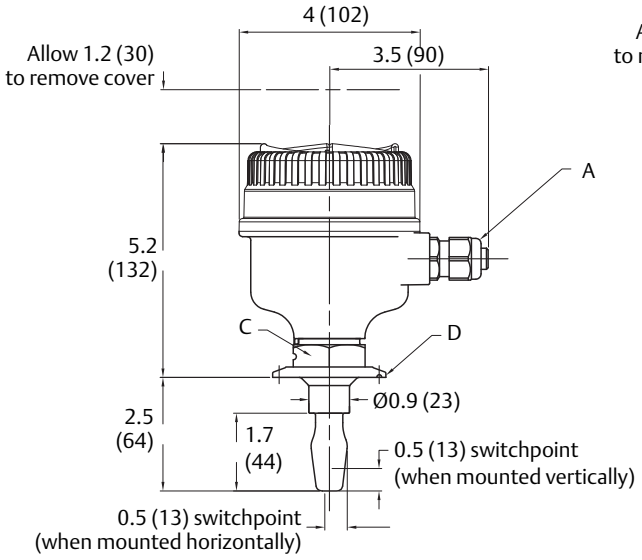
Dimensions are in inches (millimeters). See the Rosemount 2120 web page for all 1-in. BSPP threaded dimension drawings.

Table 6. Fork Length for 3/4- and 1-in. Threaded Rosemount 2120

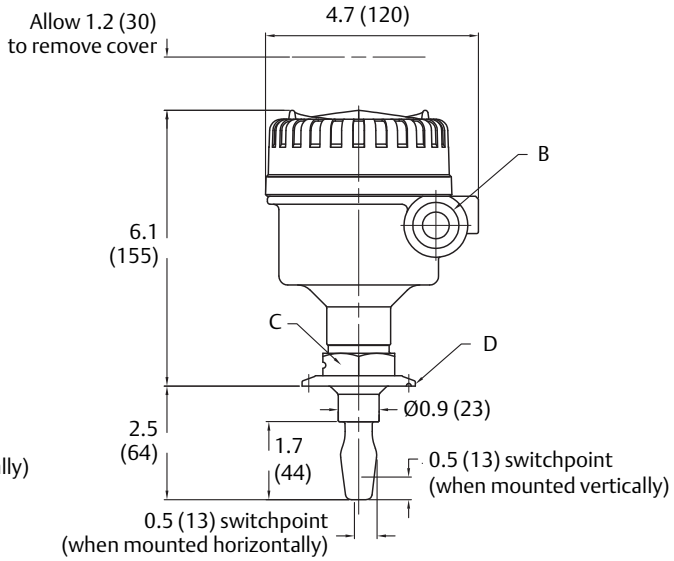
Process connection	Standard length fork length code A	Minimum length fork length code E (M)	Maximum length fork length code E (M)
3/4-in. thread	1.7 in. (44 mm)	3.75 in. (95 mm)	157.5 in. (4000 mm)
1-in. thread	1.7 in. (44 mm)	3.74 in. (94 mm)	157.5 in. (4000 mm)

Figure 5. Tri Clamp Mounting (Standard Length, Surface Finish Codes 1 and 2)

Glass-filled nylon housing (and not hygienically approved)



Aluminum/stainless steel housing (and not hygienically approved)

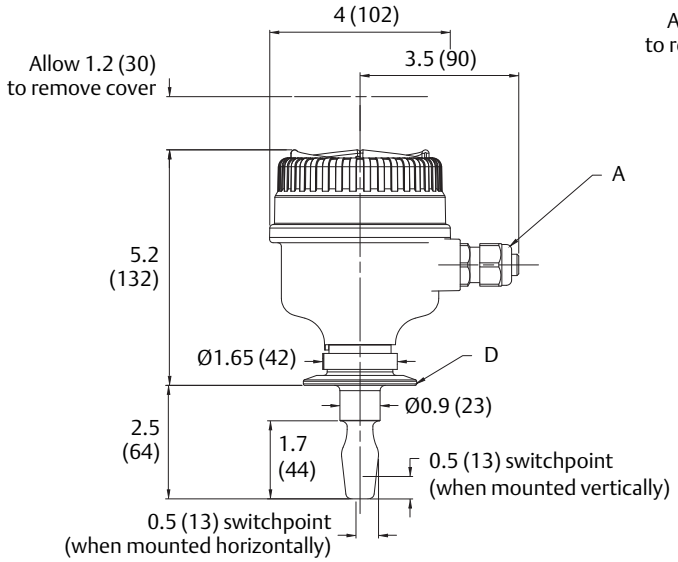


A. Cable entry M20 x 1.5 or 1/2-in. ANPT
B. Cable entry M20 x 1.5 or 3/4-in. ANPT
Dimensions are in inches (millimeters).

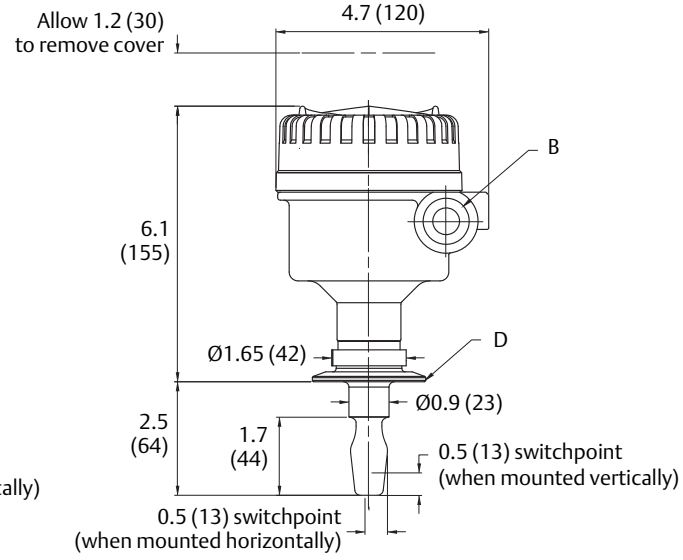
C. 1.6 (40) A/F hexagon
D. 1 1/2-in. (38 mm) or 2-in. (51 mm) Tri Clamp, surface finish codes 1 and 2

Figure 6. Tri Clamp Mounting (Standard Length, Surface Finish Codes 3, 4, 7, and 8)

Glass-filled nylon housing (and hygienically approved)



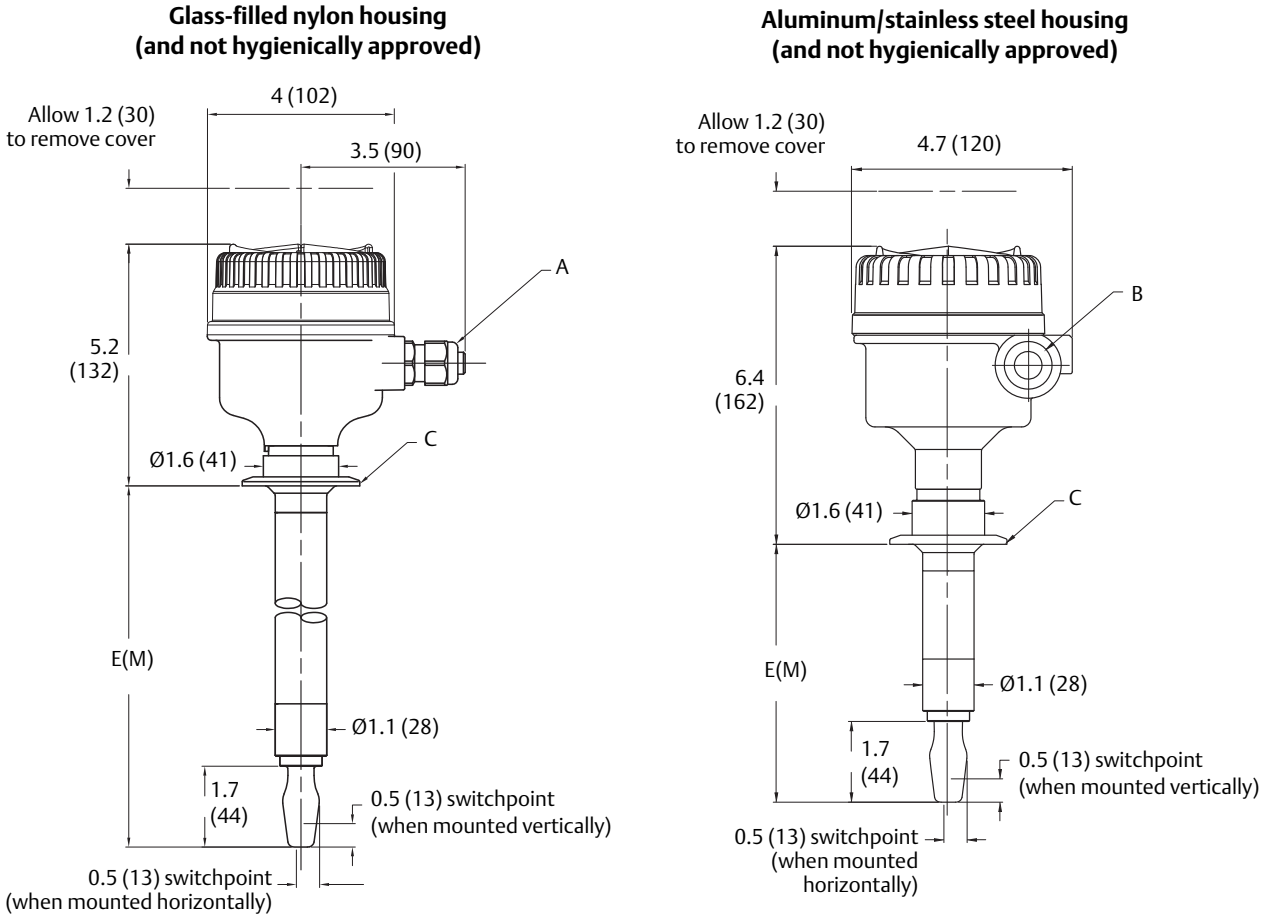
Aluminum steel housing (and hygienically approved)



A. Cable entry M20 x 1.5 or 1/2-in. ANPT
B. Cable entry M20 x 1.5 or 3/4-in. ANPT
Dimensions are in inches (millimeters).

C. 1.6 (40) A/F hexagon
D. 1 1/2-in. (38 mm) or 2-in. (51 mm) Tri Clamp, surface finish codes 3, 4, 7, and 8

Figure 7. Tri Clamp Mounting (Extended Length, Surface Finish Codes 1 and 2)



A. Cable entry M20 x 1.5 or 1/2-in. ANPT

B. Cable entry M20 x 1.5 or 3/4-in. ANPT

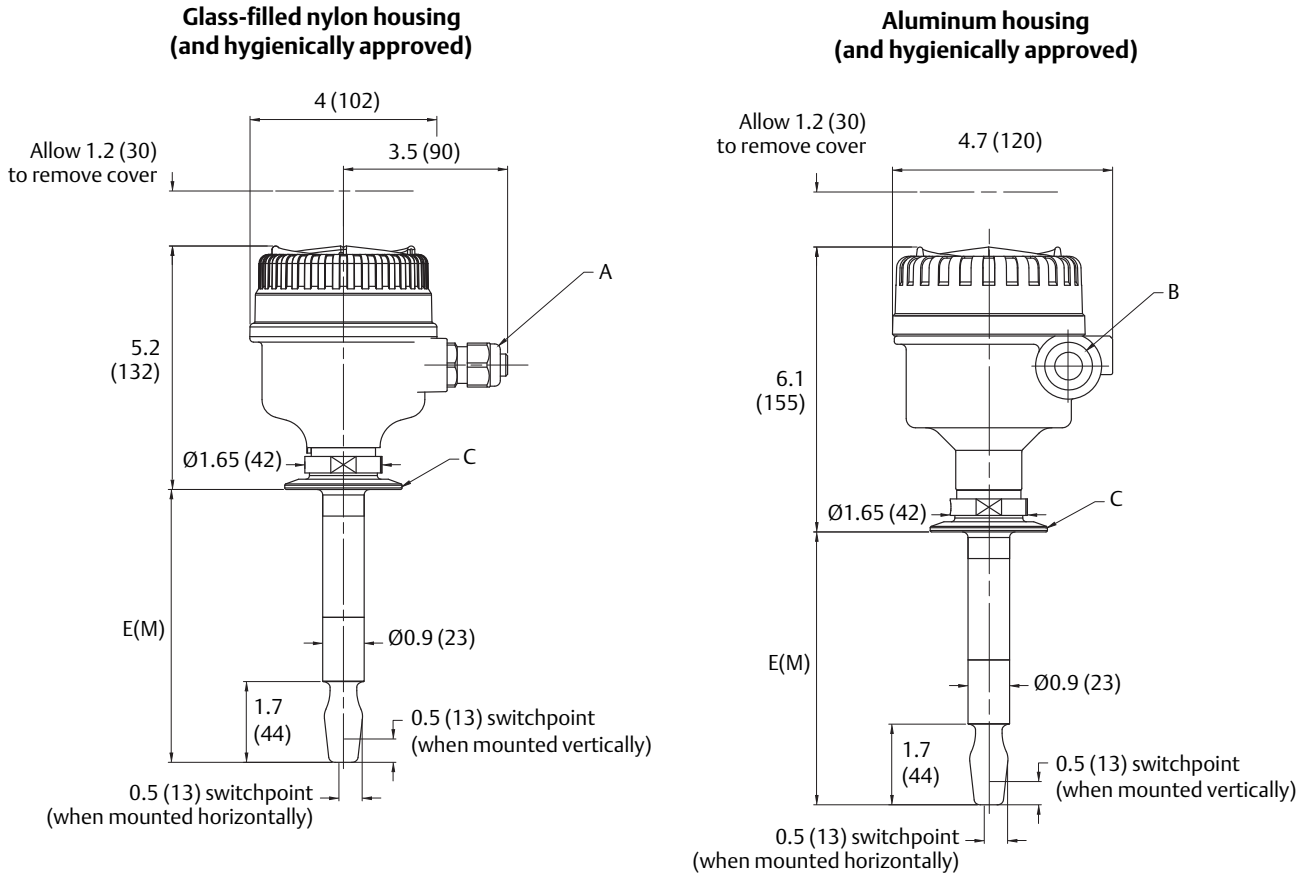
C. 1 1/2-in. (38 mm) or 2-in. (51 mm) Tri Clamp, surface finish codes 1 and 2

Dimensions are in inches (millimeters).

Table 7. Fork Lengths for Tri Clamp Rosemount 2120 (Not Hygienically Approved)

Process connection	Standard length fork length code A	Minimum length fork length code E (M)	Maximum length fork length code E (M)
Tri Clamp (surface finish code 1)	1.7 in. (44 mm)	4.13 in. (105 mm)	157.5 in. (4000 mm)
Tri Clamp (surface finish code 2)	1.7 in. (44 mm)	4.13 in. (105 mm)	157.5 in. (1000 mm)

Figure 8. Tri Clamp Mounting (Extended Length, Surface Finish Codes 3, 4, 7, and 8)



A. Cable entry M20 x 1.5 or $^{1}/_{2}$-in. ANPT

B. Cable entry M20 x 1.5 or $^{3}/_{4}$-in. ANPT

C. $1^{1}/_{2}$-in. (38 mm) or 2-in. (51 mm) Tri Clamp, surface finish codes 3, 4, 7, and 8

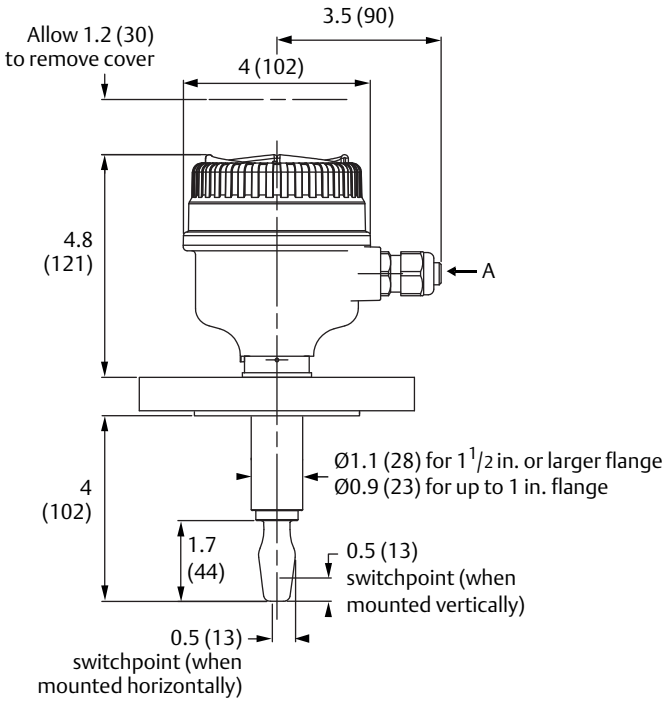
Dimensions are in inches (millimeters).

Table 8. Fork Length for Tri Clamp Rosemount 2120 (Hygienically Approved)

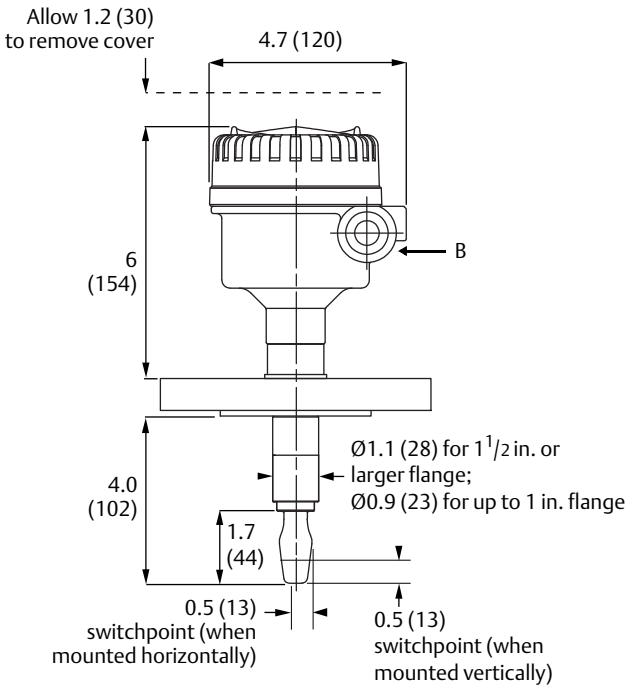
Process connection	Standard length fork length code A	Minimum length fork length code E (M)	Maximum length fork length code E (M)
Tri Clamp (surface finish codes 3, 4, 7, and 8)	1.7 in. (44 mm)	4.13 in. (105 mm)	157.5 in. (1000 mm)

Figure 9. Flange Mounting (Standard Length)

Glass-filled nylon housing



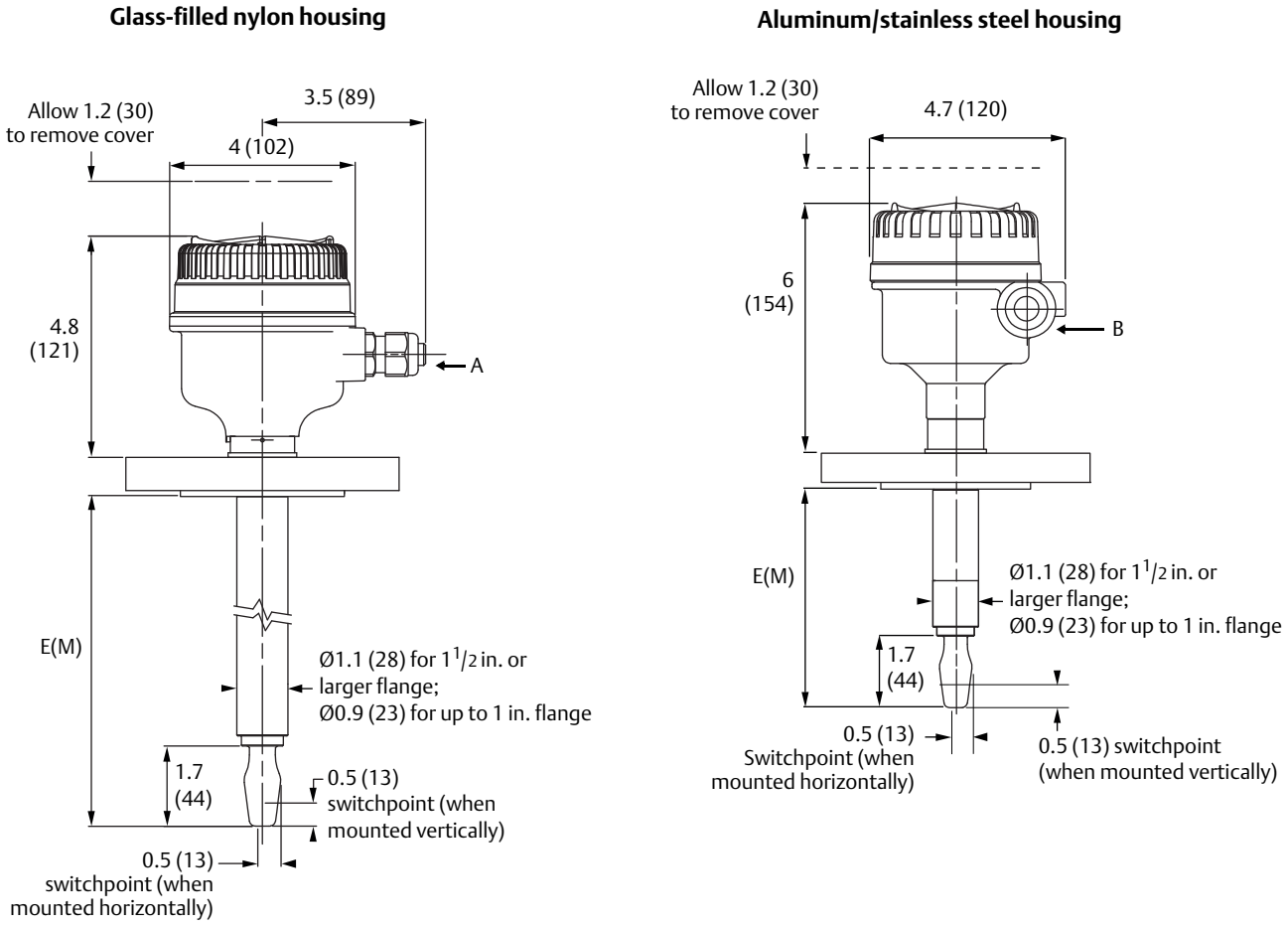
Aluminum/stainless steel housing



A. Cable entry M20 x 1.5 or 1/2-in. ANPT
B. Cable entry M20 x 1.5 or 3/4-in. ANPT

Dimensions are in inches (millimeters).

Figure 10. Flange Mounting (Extended Length)



A. Cable entry M20 x 1.5 or 1/2-in. ANPT
B. Cable entry M20 x 1.5 or 3/4-in. ANPT

Dimensions are in inches (millimeters).

Table 9. Fork Length for Flanged Rosemount 2120

Process connection material	Standard length model code H	Minimum length model code E (M)	Maximum length model code E (M)
Stainless steel	4 in. (102 mm)	3.5 in. (89 mm)	157.5 in. (4000 mm)
ECTFE co-polymer coated	4 in. (102 mm)	3.5 in. (89 mm)	59.1 in. (1500 mm)
Alloy C and Alloy C-276	4 in. (102 mm)	3.5 in. (89 mm)	157.5 in. (4000 mm)

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