

Rosemount™ 2120 Level Switch

Vibrating Fork



NOTICE

This guide provides basic guidelines for Rosemount 2120 Level Switch. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, or intrinsically safe (I.S.) installations. Refer to the Rosemount 2120 [Reference Manual](#) for more instruction. The manual and this guide are also available electronically on Emerson.com/Rosemount.

⚠ WARNING**Failure to follow these installation guidelines could result in death or serious injury.**

- The Rosemount 2120 Level Switch (“level switch”) must be installed, connected, commissioned, operated, and maintained by suitably qualified personnel only, observing any national and local requirements that may apply.
- Ensure the wiring is suitable for the electrical current and the insulation is suitable for the voltage, temperature, and environment.
- Use equipment only as specified. Failure to do so may impair the protection provided by the equipment.
- Any substitution of non-recognized parts may jeopardize safety and is under no circumstances allowed.
- The weight of the level switch with a heavy flange and extended fork length may exceed 37 lb (18 kg). A risk assessment is required to be done before carrying, lifting, and installing the level switch.

Explosions could result in death or serious injury.

- Installation of the level switch in a hazardous environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Please review [Product certifications](#) for any restrictions associated with a safe installation.
- Verify that the operating atmosphere of the level switch is consistent with the appropriate hazardous locations certifications.

External surface may be hot.

- Care must be taken to avoid possible burns.

Process leaks could result in death or serious injury.

- Install and tighten process connectors before applying pressure.
- Do not attempt to loosen or remove process connectors while the level switch is in service.

Electrical shock could cause death or serious injury.

- If the liquid level switch is installed in a high voltage environment and a fault condition or installation error occurs, high voltage may be present on leads and terminals.
- Use extreme caution when making contact with the leads and terminals.
- Make sure that power to the level switch is off while making connections.

1.0 Introduction

1.1 Rosemount 2120 overview

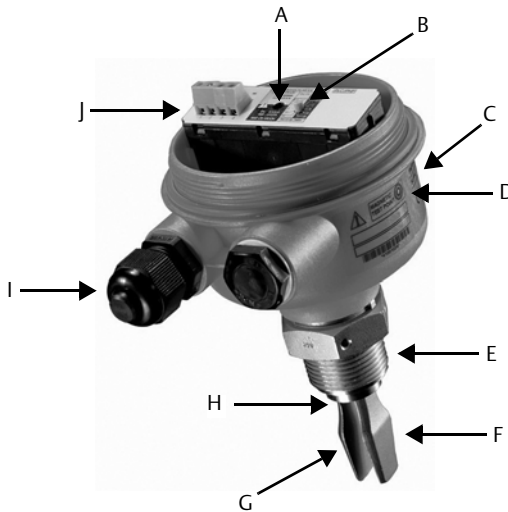
The Rosemount 2120 Level Switch (“level switch”) uses vibrating short fork technology, and is suitable for virtually all liquid applications.

The level switch is designed to use the principle of a tuning fork. A piezo-electric crystal oscillates the forks at their natural frequency (~ 1400 Hz). 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 to a dry condition. When the level switch 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 to a wet condition.

The level switch has a ‘heartbeat’ LED that indicates its operating state. The LED flashes when the switch output is ‘off’ and is constantly lit when ‘on’.

Figure 1. Rosemount 2120 Features



- A. Visible ‘heartbeat’ LED
- B. Mode switch and adjustable time delay
- C. Housings in glass-filled nylon, aluminum, or 316 SST
- D. Magnetic test point
- E. Threaded, flanged, or hygienic connections.
- F. ‘Fast drip’ fork design

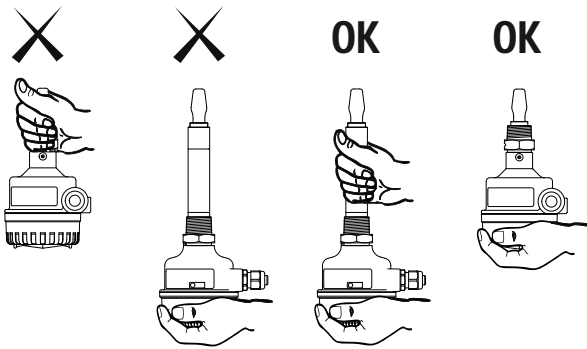
- G. Wetted material in 316/316L SST, solid Alloy C and Alloy C-276, or ECTFE-coated 316/316L SST
- H. Short fork length or extensions up to 157.5-in. (4 m)
- I. Two cable/conduit entries
- J. Direct Load, Relay DPCO, PLC/PNP, NAMUR, or 8/16 mA electronics

2.0 Before installation

2.1 General considerations

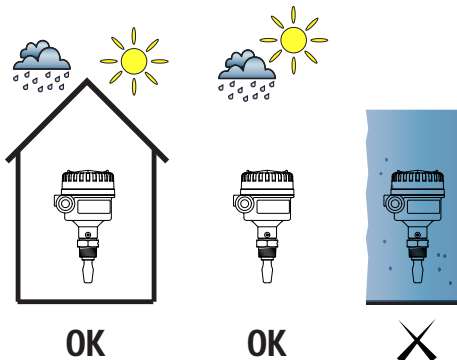
- The level switch is available as intrinsically safe or explosion-proof/flameproof versions. There are also ordinary location versions of the level switch for unclassified, safe areas, and hygienic versions. See “[Product certifications](#)” on [page 15](#) for hazardous area and hygienic installation requirements.
- The weight of the Rosemount 2120 Level Switch (“level switch”) with a heavy flange and extended fork length may exceed 37 lb. (18 kg). A risk assessment is required to be done before carrying, lifting, and installing the level switch.
- Handle the Rosemount 2120 with great care ([Figure 2](#)).

Figure 2. Handling the Rosemount 2120



- This liquid level switch is designed for open or closed tanks, and pipe installation. It is weatherproof and protected against the ingress of dust, but must be protected from flooding ([Figure 3](#)).

Figure 3. Environmental Considerations

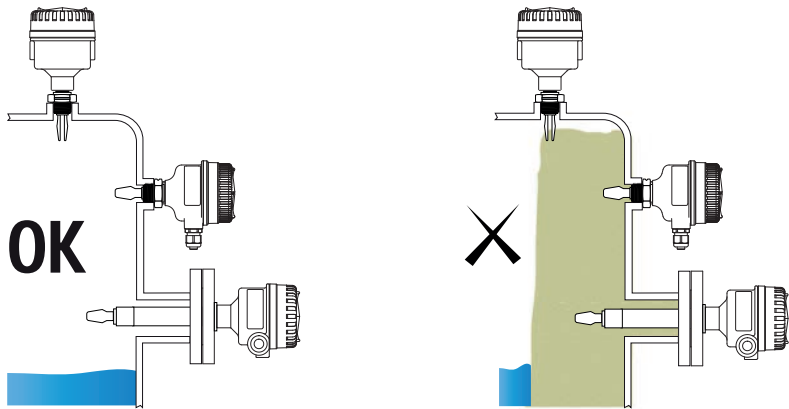


- Ensure there is adequate space outside the tank or pipe. A clearance of 1.2 in. (30 mm) is required for the cover to be removed.
- Always ensure a proper seal by installing the metal housing cover so that metal contacts metal, or plastic contacts plastic. Use Rosemount O-rings.
- Always ground the housing in accordance with national and local electrical codes. The most effective grounding method is a direct connection to earth (ground) with minimal impedance. Use the fork earth for metal housings with NPT conduit entries.

2.2 Installation recommendations

- **Avoid** installing near liquid entering the tank at the fill point.
- **Avoid** heavy splashing on the forks. Increasing the time delay reduces accidental switching.
- **Avoid** installing near heat sources.
- **Ensure** the fork does not come into contact with a tank/pipe wall or fittings.
- There must be no risk of ‘bridging’ the forks ([Figure 4](#)).

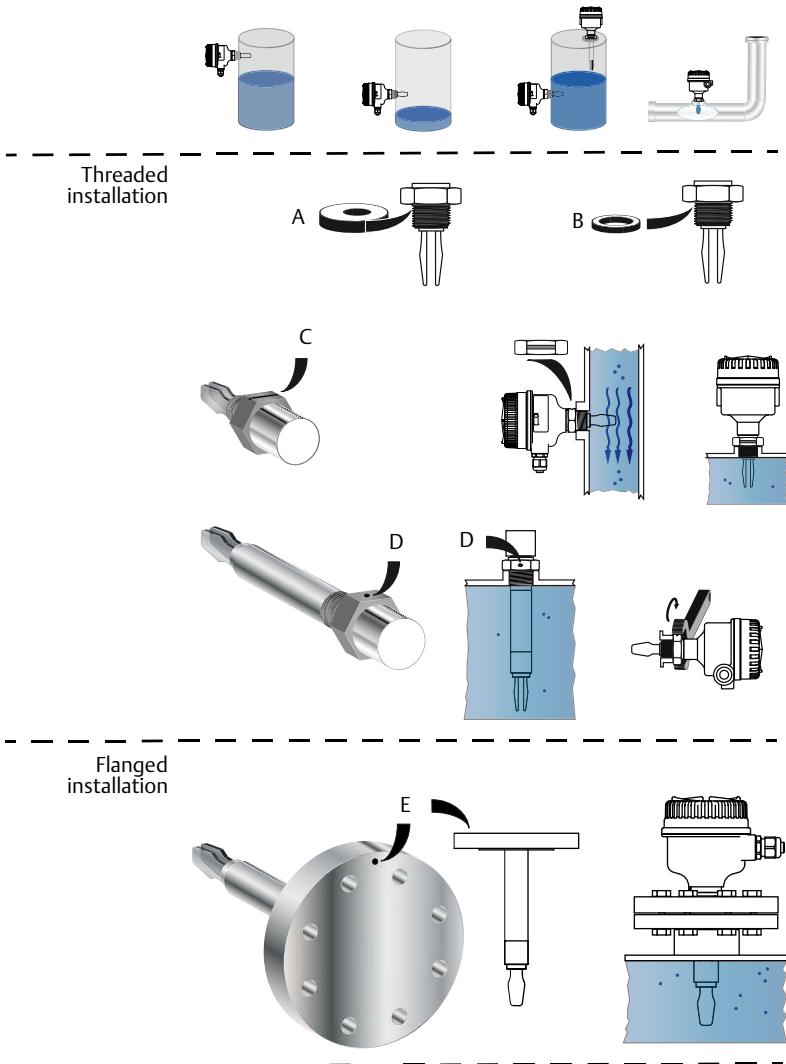
Figure 4. Avoid Product Build-up



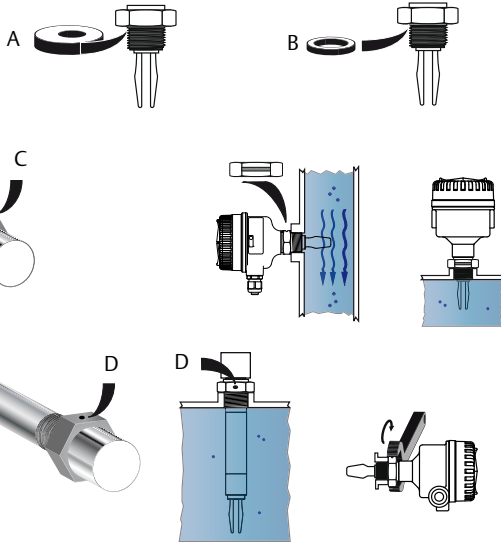
3.0 Physical installation

1. Install the level switch according to standard installation practices, making sure to correctly align the fork using the alignment notch or groove ([Figure 5](#)).
2. Use supports for extended fork lengths greater than 3.2 ft. (1 m). Refer to the Rosemount 2120 [Reference Manual](#) for guidance.
3. Close the housing cover and tighten to safety specification. Always ensure a proper seal so that metal touches metal or plastic touches plastic, but do not over tighten.
4. Insulate the level switch with ROCKWOOL®. Allow 3.9 in. (100 mm) of clearance all around the housing.

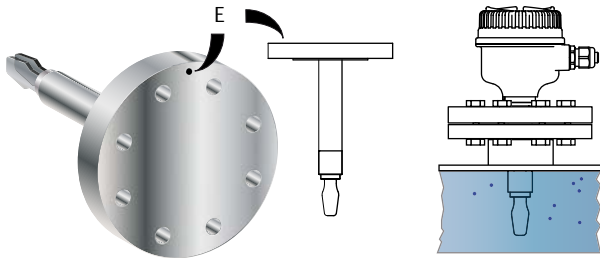
Figure 5. Example Installations



Threaded installation



Flanged installation






Tri Clamp installation

See the Rosemount 2120 Quick Release Kit [Quick Start Guide](#) for general Tri Clamp installation instructions.
See also “[Instructions for hygienic installations](#)” on page 26 for hygienic installation requirements.

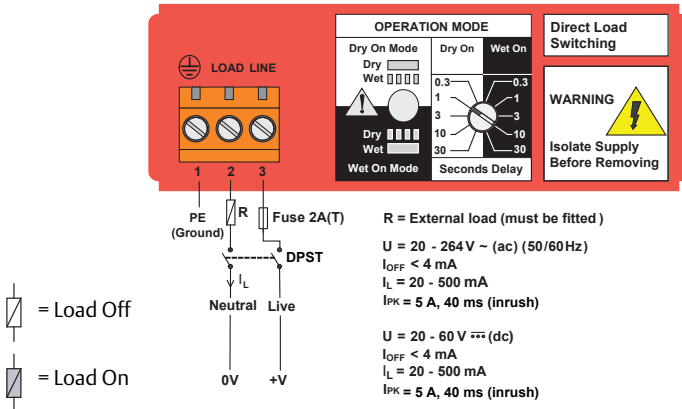
- A. PTFE for NPT and BSPT (R) thread
- B. Gasket for BSPP (G) thread
- C. Fork alignment groove

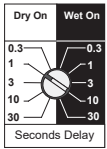
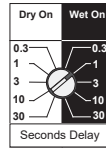
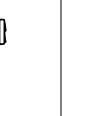

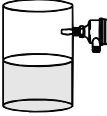
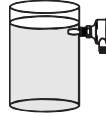

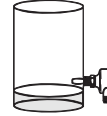
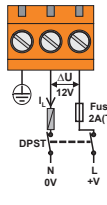
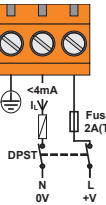
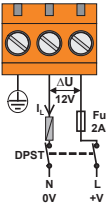
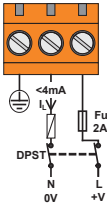




- D. Fork alignment notch
- E. Fork alignment notch

4.0 Electrical installation

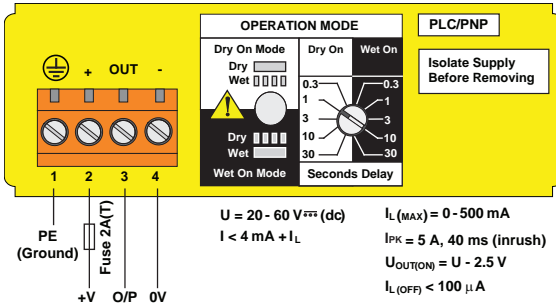
-  Before use, check that suitable cable glands and blanking plugs are fitted and fully tightened.
-  Isolate supply before connecting the switch or removing the electronics.
-  The functional earth terminal must be connected to an external earthing system.

4.1 Direct load switching electronics (two-wire, red label)



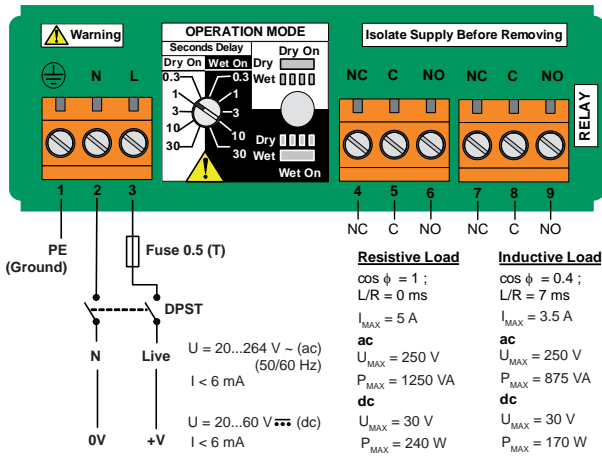
High level, dry = on		Low level, wet = on	
			
			
			
 LED on continuously	 LED flashes each second	 LED on continuously	 LED flashes each second

4.2 PNP/PLC switching electronics (yellow label)



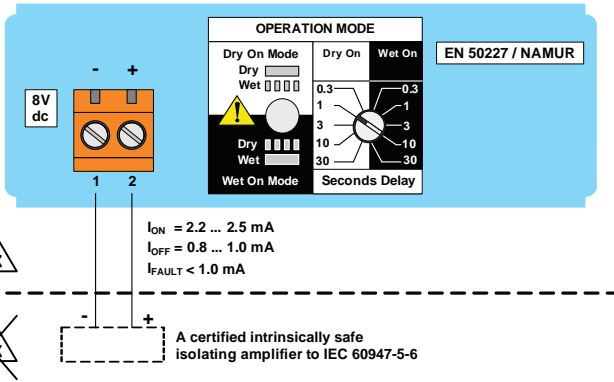
	High level, dry = on		Low level, wet = on	
PLC (positive input)				
PNP dc				
	LED on continuously	LED flashes each second	LED on continuously	LED flashes each second

4.3 DPCO relay output electronics (green label, standard version)



High level, dry = on		Low level, wet = on	
LED on continuously	LED flashes each second	LED on continuously	LED flashes each second

4.5 NAMUR electronics (light blue label)



High level, dry = on		Low level, wet = on	
LED on continuously	LED flashes each second	LED on continuously	LED flashes each second

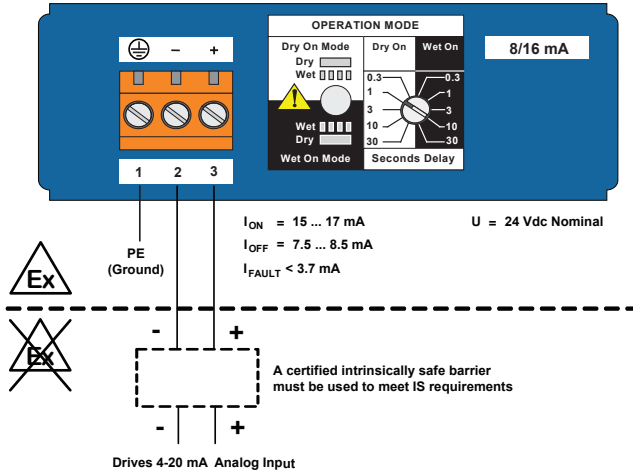
Note

This cassette is suitable for Intrinsically Safe applications and requires an isolating barrier. See “[Product certifications](#)” on page 15 for Intrinsically Safe approvals.

This electronics cassette is also suitable for non-hazardous (safe) area applications. It can only be interchanged with the 8/16 mA cassette.

Do not exceed 8 Vdc.

4.6 8/16 mA electronics cassette (dark blue label)



High level, dry = on		Low level, wet = on	

Note

This cassette is suitable for Intrinsically Safe applications and requires an isolating barrier.

See “Product certifications” on page 15 for Intrinsically Safe approvals.

This cassette is also suitable for non-hazardous (safe) area applications. It can only be interchanged with a NAMUR cassette.

5.0 Configuration

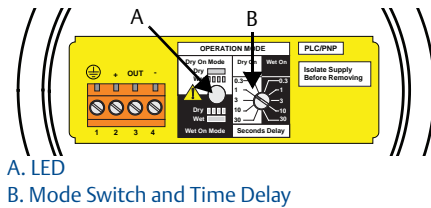
Note

Recommended installation for a high level alarm is “Dry on” and for a low level alarm it is “Wet on”. Do not install in the normally ‘off’ state.

Set mode switch and switching time delay

1. Select “Dry on” or “Wet on” mode.
2. Select 0.3, 1, 3, 10, or 30 seconds for the delay before switching output state. (There is an initial five second delay when changing mode or time delay).

Figure 6. Top-down View of Example Cassette Inside Housing










6.0 Verify operation

6.1 LED indication

See Table 1 for the LED indications.

Table 1. LED Flash Rate

LED flash rate		Switch status
	Continuous	Output state is on
	1 every second	Output state is off
	1 every 2 seconds	Uncalibrated: Refer to the “Replacement and Calibration of Electronic Cassettes” section in the Rosemount 2120 Reference Manual or Manual Supplement
	1 every 4 seconds	Load fault; load current too high; load short circuit
	2 times every second	Indication of successful calibration
	3 times every second	Internal PCB fault (microprocessor, ROM, or RAM)
	Off	Problem (e.g. supply)

6.2 Magnetic test point

The magnetic test-point is on the side of the housing, allowing a functional test of the level switch. By touching a magnet on the target, the output will change state for as long as the magnet is held there.

Figure 7. Magnetic Test Point (Metal Housing)

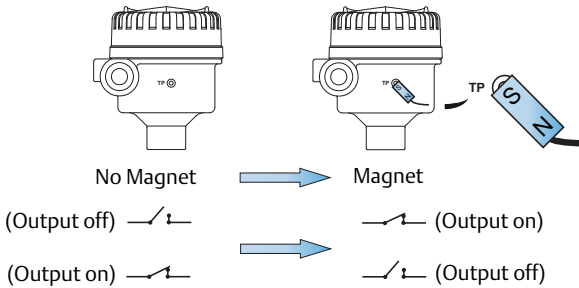
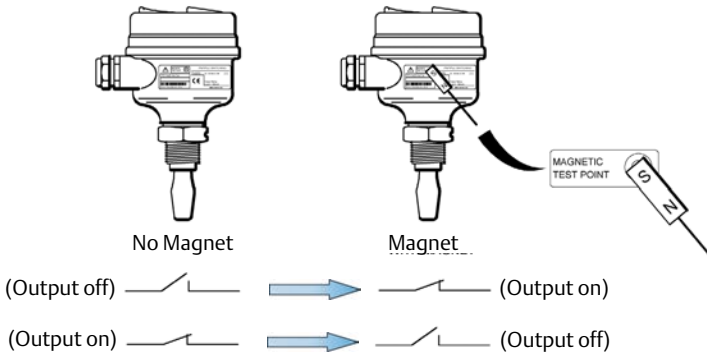


Figure 8. Magnetic Test Point (Glass-filled Nylon Housing)



7.0 Maintenance and inspection

- Only use a damp cloth for cleaning.
- Visually examine the level switch for damage. If it is damaged, do not use.
- Ensure the housing cover, cable glands, and blanking plugs are fitted securely.
- Ensure the LED flash rate is 1 Hz or continually on.
(See “LED indication” on page 13).

8.0 Spare parts

- See the Rosemount 2120 [Product Data Sheet](#) for spares and accessories.

9.0 Troubleshooting

Table 2. Troubleshooting Chart

Fault	Symptom and indication	Action and solution
Does not switch	No LED; no power	Check the power supply; (check load on direct load switching electronics model)
	LED flashing	See “LED indication” on page 13
	Fork is damaged	Replace the Rosemount 2120
	Thick encrustation on the forks	Clean the fork with care
	5 second delay when changing mode/delay	This is normal – wait 5 seconds
Incorrect switching	Dry = On, Wet = On set correctly	Set the correct mode on the electronics cassette
Faulty switching	Turbulence	Set a longer switching time delay
	Excessive electrical noise	Suppress the cause of the interference
	Cassette has been fitted from another Rosemount 2120	Fit the factory supplied cassette and then calibrate ⁽¹⁾

1. Refer to the “Replacement and Calibration of Electronic Cassettes” section in the Rosemount 2120 [Reference Manual](#) or [Manual Supplement](#).

10.0 Product certifications

10.1 European Union directive information

The EC declaration of conformity for all applicable European directives for this product can be found on [page 28](#) and at Emerson.com/Rosemount.

10.2 Hygienic approvals and compliance

3-A[®] (authorization 3496), and **EHEDG** (certificate: 102016)

ASME-BPE and **FDA** compliant

(See “Instructions for hygienic installations” on page 26)

10.3 Overfill approval

Certificate number: 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.

10.4 Marine approvals

ABS – American Bureau of Shipping

GL – Germanischer Lloyd

SRS – Russian Maritime Registered Shipping (RMRS)

10.5 NAMUR approval

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

10.6 Drinking water approval

Rosemount Measurement Limited, Slough, UK confirms that the wetted parts of the Rosemount 2120 Vibrating Liquid 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.

10.7 Ordinary location certifications

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 seal.

10.8 Canadian Registration Number

Certificate 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.

10.9 Safety Integrity Level (SIL) certification

The Rosemount 2120 has been independently certified to IEC 61508 as required by IEC 61511. Certification was conducted by Exida.

The Rosemount 2120 is SIL2-certified, and is SIL3 capable.

10.10 Hazardous locations certifications

Note

A certified isolating amplifier to IEC 60947-5-6 is required for intrinsic safety if the NAMUR electronics is used in a hazardous area installation

A certified intrinsically safe barrier is required for intrinsic safety if the 8/16 mA electronics is used in a hazardous area installation

North American and Canadian approvals

Factory Mutual (FM) explosion-proof approval

(See “Instructions for hazardous area installations (E5 and E6)” on page 18)

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 and non-incendive approvals

(See “Instructions for hazardous area installations (I5 and I6)” on page 20)

I5 Project ID: 3011456

Intrinsically safe for:
 Class I, Div. 1, Groups A, B, C, and D; Class I, Zone 0, AEx ia IIC
 Nonincendive 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, T_{proc} < 80 °C)
 Control Drawing: 71097/1154 (with NAMUR electronics)
 Control Drawing: 71097/1314 (with 8/16 mA electronics)

Canadian Standards Association (CSA) explosion-proof approval

(See “Instructions for hazardous area installations (E5 and E6)” on page 18)

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 approvals

(See “Instructions for hazardous area installations (I5 and I6)” on page 20)


I6 Certificate Number: 06 CSA 1786345


Intrinsically safe for:
 Class I, Div. 1, Groups A, B, C, and D; Class I, 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, T_{proc} < 80 °C)
 Control Drawing: 71097/1179 (with NAMUR electronics)
 Control Drawing: 71097/1315 (with 8/16 mA electronics)
 Single process seal

European approvals

ATEX approvals

E1 Certificate: Sira 05ATEX1129X

Flameproof and dust-proof:
 ATEX Marking  II 1/2 GD
 Ex db IIC T6...T2 Ga/Gb, Ex tb IIIC T85 °C...T265 °C Db
 (See “Instructions for hazardous area installations (E1 and E7)” on page 22)

- I1** Certificate: Sira 05ATEX2130X
 Intrinsically Safe for gas and dust environments:
 ATEX Marking  II 1 G D
 Ex ia IIC T5...T2 Ga, Ex ia IIIC T85 °C...T265 °C Da
 (See “Instructions for hazardous area installations (I1 and I7)” on page 24)

International approvals

International Electrotechnical Commission (IEC) approvals

- 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
 (See “Instructions for hazardous area installations (E1 and E7)” on page 22)
- 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
 (See “Instructions for hazardous area installations (I1 and I7)” on page 24)

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)

10.11 Instructions for hazardous area installations (E5 and E6)

Model numbers covered:

2120****E5Y**, 2120****E5T**, 2120****E6Y**, 2120****E6T**
 (“**” indicates options in construction, function and materials).

The following instructions apply to equipment covered by CSA and FM explosion-proof approvals:

1. The equipment may be used with flammable gases and vapors with apparatus Class 1, Div 1, Groups A, B, C and D.
2. CSA and FM Explosion Proof approved versions of the 2120 are certified for use in ambient temperatures of -40 °F to 176 °F (-40 °C to 80 °C), and with a maximum process temperature of 302 °F (150 °C).
3. Installation of this equipment shall be carried out by suitably trained personnel, in accordance with the applicable code of practice.
4. Inspection and maintenance of this equipment shall be carried out by suitably trained personnel, in accordance with the applicable code of practice.
5. The user should not repair this equipment.
6. The certification of this equipment relies upon the following materials used in its construction:
 Body: Aluminum Alloy (ASTM B85 360.0) or 316 SST

Lid: Aluminum Alloy (ASTM B85 360.0) or 316 SST

Probe:

316 Stainless Steel, or Alloy C276 (UNS N10276) and Alloy C (UNS N10002)

Probe filling: Perlite

Lid seal: Silicone

If the equipment is likely to come into contact with aggressive substances, it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

Aggressive substances – e.g. acidic liquids or gases that may attack metals or solvents that may affect polymeric materials.

Suitable precautions – e.g. regular checks as part of routine inspections or establishing from the material’s data sheet that it is resistant to specific chemicals.

The metallic alloy used for the enclosure material may be at the accessible surface of this equipment; in the event of rare accidents, ignition sources due to impact and friction sparks could occur. This shall be considered when the level switch is installed in locations that specifically require Class 1, Div 1 equipment.

7. It is the responsibility of the user to ensure:
 - a. The voltage and current limits for this equipment are not exceeded.
 - b. That the joint requirements between the switch and the vessel tank are compatible with the process media.
 - c. That the joint tightness is correct for the joint material used.
 - d. That only certified cable entry devices will be used when connecting this equipment.
 - e. That any unused cable entries are sealed with suitably certified stopping plugs.
8. The switch fork is subjected to small vibration stresses as part of its normal function. As this provides a partition wall, it is recommended that the fork should be inspected every 2 years for signs of defects.
9. Technical data:
 - a. Coding: Class 1, Div 1, Groups A, B, C, and D
 - b. Temperature:

2120**E5Y**, 2120****E5T**, 2120****E6Y**, 2120****E6T**:**

Temperature classes	Maximum ambient air temperature (Ta)	Maximum process temperature (Tp)
T6, T5, T4, T3, T2, T1	75 °C	75 °C
T5, T4, T3, T2, T1	70 °C	95 °C
T4, T3, T2, T1	65 °C	125 °C
T3, T2, T1	50 °C	150 °C

Minimum ambient air temperature (Ta) = -40 °C

Minimum process temperature (Tp) = -40 °C

- c. Pressure: Must not exceed the rating of the coupling/flange fitted.
- d. For electrical details and pressure ratings, see the Rosemount 2120 [Product Data Sheet](#) or [Reference Manual](#).

10. Cable selection:

- a. It is the responsibility of the user to ensure that suitably temperature rated cable is used. The table below is a guide to selection:

T class	Cable temperature rating
T6	Above 185 °F (85 °C)
T5	Above 212 °F (100 °C)
T4	Above 275 °F (135 °C)
T3	Above 320 °F (160 °C)

10.12 Instructions for hazardous area installations (I5 and I6)

Model numbers covered:

2120***H*I5A*, 2120***K*I5D*,

2120***H*I6A*, 2120***K*I6D*

("*" indicates options in construction, function and materials.)

The following instructions apply to equipment covered by FM and CSA approvals:

- The intrinsically safe approved Rosemount 2120 may be used in hazardous locations with flammable gases and vapors Class 1 Division 1 Groups A, B, C, and D, and Class 1 Zone 0 Group IIC when installed in accordance with control drawings 71097/1154, 71097/1314, 71097/1179, or 71097/1315 in the Rosemount 2120 [Reference Manual](#).
- The non-incendive approved Rosemount 2120 may be used in hazardous locations with flammable gases and vapors Class 1 Division 2 Groups A, B, C, and D when installed in accordance with control drawings 71097/1154, 71097/1314, 71097/1179, or 71097/1315 in the Rosemount 2120 [Reference Manual](#).
- The apparatus electronics is only certified for use in ambient temperatures in the range of -40 °C to +80 °C. It should not be used outside this range. However, the switch may be located in the process medium which may be at a higher temperature than the electronics but must not be higher than the Temperature Class for the respective process gas/medium.

Process Temperature	Temperature classes
176 °F (80 °C)	T1, T2, T3, T4, T5
239 °F (115 °C)	T1, T2, T3, T4
302 °F (150 °C)	T1, T2, T3

It is a condition of the approval that the temperature of the electronics housing is in the range of -40 °F to +176 °F (-40 to +80 °C). It must not be used outside this range. It will be necessary to limit the external ambient temperature if the process temperature is high. (See "Technical data" below.)

4. Suitably trained personnel shall carry out installation in accordance with the applicable code of practice.
5. The user should not repair this equipment.
6. If the equipment is likely to come into contact with aggressive substances, it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

Aggressive substances – e.g. acidic liquids or gases that may attack metals or solvents that may affect polymeric materials.

Suitable precautions – e.g. regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals

7. If the enclosure is made of an alloy or plastic material, the following precautions must be observed:
 - a. The metallic alloy used for the enclosure material may be at the accessible surface of this equipment; in the event of rare accidents, ignition sources due to impact and friction sparks could occur
 - b. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of the Rosemount 2120 may generate an ignition-capable level of electrostatic charge. Therefore, when they are used for applications that specifically require group II equipment, the Rosemount 2120 shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the Rosemount 2120 shall only be cleaned with a damp cloth.
8. Technical data:
 - a. I.S. approval: Class 1 Division 1 Groups ABC and D, Class 1 Zone 0 AEx ia IIC
Non-Incendive Approval: Class 1 Division 2 Groups ABC and D
T5 (Ta = -40 °F to +176 °F [-40 °C to +80 °C])
T4 (Ta = -40 °F to +239 °F [-40 °C to +115 °C])
T3 (Ta = -40 °F to +302 °F [-40 °C to +150 °C])
Ta = the higher of the process or ambient temperature.
 - b. Input parameters:
Rosemount 2120 with NAMUR electronics:
Vmax=15 V, Imax=32 mA, Pi=0.1 W, Ci=211 nF, Li=0.06 mH
Rosemount 2120 with 8/16 mA electronics:
Vmax=30 V, Imax=93 mA, Pi=0.65 W, Ci=12 nF, Li=0.035 mH
 - c. Temperature:
Process (Tp) -40 °C to 150 °C
External (Ta) -40 °C to +80 °C
(up to Tp=80 °C, reducing linearly to 50 °C at Tp=150 °C)
 - d. Materials:
See the Rosemount 2120 [Product Data Sheet](#) or [Reference Manual](#).

10.13 Instructions for hazardous area installations (E1 and E7)

Model numbers covered:

2120****E1X**, 2120****E1S**, 2120****E7X**, 2120****E7S**
 (“*” indicates options in construction, function and materials.)

The following instructions apply to the equipment covered by certificates numbered **Sira 05ATEX1129X and IECEx SIR 06.0051X**:

1. The equipment may be used with flammable gases and vapors with apparatus groups IIA, IIB, and IIC, and with temperature classes T1, T2, T3, T4, T5, and T6. The temperature class of the installation will be determined from the higher of the process or ambient temperature.
2. The equipment may be used in a hazardous area with explosive dusts with apparatus groups IIIC, IIIB, and IIIA. The maximum surface temperature of the installation will be determined from the higher of the process or ambient temperature.
3. The equipment is suitable for installation across the boundary between an area that specifically requires Equipment Protection Level Ga (Zone 0) and an area that specifically requires Equipment Protection Level Gb or Db (Zone 1 or 21). The probe forks (and extension tube) only to be installed in Zone 0.
4. The equipment has not been assessed as a safety related device (as referred to by Directive 94/9/EC (2014/34/EU) Annex II, clause 1.5).
5. Installation of this equipment shall be carried out by suitably trained personnel, in accordance with the applicable code of practice.
6. Inspection and maintenance of this equipment shall be carried out by suitably trained personnel, in accordance with the applicable code of practice.
7. The user should not repair this equipment. Repair or modification of flame-paths is not permitted.
8. The certification of this equipment relies upon the following materials used in its construction:

Housing and cover:

Aluminum alloy (ASTM B85 360.0) or stainless steel 316C12

Probe (partition wall): Stainless steel 316L or 316/316L, or Alloy C276 (UNS N10276) and Alloy C (UNS N10002 or N30002)

Probe filling: Perlite

Lid seal: Silicone

If the equipment is likely to come into contact with aggressive substances, it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

Aggressive substances: e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.

Suitable precautions: e.g. regular checks as part of routine inspections or establishing from the material's data sheet that it is resistant to specific chemicals.

9. It is the responsibility of the user to ensure:
 - a. The voltage and current limits for this equipment are not exceeded.
 - b. That the joint requirements between the probe and the vessel tank are compatible with the process media.
 - c. That the joint tightness is correct for the joint material used.
 - d. That only suitably certified cable entry devices will be utilized when connecting this equipment.
 - e. That any unused cable entries are sealed with suitably certified stopping plugs.
10. The probe fork is subjected to small vibration stresses as part of its normal function. As this provides a partition wall, it is recommended that the fork should be inspected every 2 years for signs of defects.
11. Technical data:

a. Coding:

ATEX: II 1/2 G D, Ex db IIC T6...T2 Ga/Gb, Ex tb IIIC T85°C...T 265°C Db

IECEX: Ex db IIC T6...T2 Ga/Gb, Ex tb IIIC T85°C...T 265°C Db

b. Temperature:

2120***E1X**, 2120*****E1S**, 2120*****E7X**, 2120*****E7S**:**

Temperature classes	Maximum surface temperature (T)	Maximum ambient air temperature (Ta)	Maximum process temperature (Tp)
T6, T5, T4, T3, T2, T1	T85 °C	75 °C	75 °C
T5, T4, T3, T2, T1	T100 °C	70 °C	90 °C
T4, T3, T2, T1	T135 °C	65 °C	125 °C
T3, T2, T1	T160 °C	50 °C	150 °C

Minimum ambient air temperature (Ta) = -40°C

Minimum process temperature (Tp) = -40°C

- c. Pressure: Must not exceed the rating of the coupling/flange fitted.
- d. For electrical details and pressure ratings, see the Rosemount 2120 [Product Data Sheet](#) or [Reference Manual](#).
- e. Year of manufacture: marked on the product label
12. Cable selection
 - a. It is the responsibility of the user to ensure that suitably temperature rated cable is used. Note that the cable entry temperature may exceed 70 °C. The table below is a guide to selection:

T class	Cable temperature rating
T6	Above 85 °C
T5	Above 100 °C
T4	Above 135 °C
T3	Above 160 °C

13. Special conditions of use
 - a. The user is to ensure the probe assembly is installed in such a way to prevent any damage due to impact or ignition source due to friction.
 - b. Under certain extreme circumstances, a non-standard paint on the enclosure of the Rosemount 2120 may generate an ignition-capable level of electrostatic charge. Therefore, the Rosemount 2120 shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the Rosemount 2120 shall only be cleaned with a damp cloth.
 - c. The user is to ensure the ambient air temperature (T_a) and the process temperature (T_p) are within the range detailed above for the T class of the specific flammable gases or vapors present.
 - d. The user is to ensure the ambient air temperature (T_a) and the process temperature (T_p) are within the range detailed above for the maximum surface temperature of the specific flammable dusts present.

10.14 Instructions for hazardous area installations (I1 and I7)

Model numbers covered:

2120**H*I1**, 2120**K*I1**

2120**H*I7**, 2120**K*I7*

(* indicates options in construction, function and materials)

The following instructions apply to the equipment covered by certificates numbered **Sira 05ATEX2130X** and **IECEX Sir 06.0070X**:

1. The Intrinsically Safe approved versions of the 2120 may be used in a hazardous area with explosive gases and vapors with apparatus groups IIC, IIB, and IIA, and with temperature classes T1, T2, T3, T4, and T5 [**IECEX**: in Zones 0, 1, and 2].

The temperature class of the installation will be determined from the higher of the process or ambient temperature.

2. The equipment may be used in a hazardous area with explosive dusts with apparatus groups IIIC, IIIB, and IIIA [**IECEX**: in Zones 20, 21, and 22].

The maximum surface temperature of the installation will be determined from the higher of the process or ambient temperature.

3. It is a special condition of the certification that the temperature of the electronics housing is in the range of -50 to $+80$ °C.

It must not be used outside this range. It will be necessary to limit the external ambient temperature if the process temperature is high.

See also “Technical data” below.

4. Suitably trained personnel shall carry out installation in accordance with the applicable code of practice.
5. The user should not repair this equipment.
6. If the equipment is likely to come into contact with **aggressive substances**, it is the responsibility of the user to take **suitable precautions** that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

Aggressive substances – e.g. acidic liquids or gases that may attack metals or solvents that may affect polymeric materials.

Suitable precautions – e.g. regular checks as part of routine inspections or establishing from the material’s data sheet that it is resistant to specific chemicals.

- 7. The Rosemount 2120 meets the requirements of clause 6.3.12 (Isolation of circuits from earth or frame) in EN 60079-11 (IEC 60079-11).
- 8. Technical data:

a. Coding:

ATEX: II 1 G D, Ex ia IIC T5...T2 Ga, Ex ia IIIC T85 °C...T265 °C Da

IECEX: Ex ia IIC T5...T2 Ga, Ex ia IIIC T85 °C...T265 °C Da

b. Temperature:

2120*H*I1** , 2120***H*I7**:**

Gas (Ga) and Dust (Da)			
Temperature classes	Maximum surface temperature (T)	Maximum ambient air temperature (Ta)	Maximum process temperature (Tp)
T5, T4, T3, T2, T1	T85 °C	80 °C	60 °C
T4, T3, T2, T1	T120 °C	60 °C	115 °C
T3, T2, T1	T155 °C	50 °C	150 °C

Minimum ambient air temperature (Ta) = -40 °C

Minimum process temperature (Tp) = -40 °C

2120*K*I1** , 2120***K*I7**:**

Temperature classes	Gas (Ga)		Dust (Da)		
	Maximum ambient air temperature (Ta)	Maximum process temperature (Tp)	Maximum surface temperature (T)	Maximum ambient air temperature (Ta)	Maximum process temperature (Tp)
T5, T4, T3, T2, T1	80 °C	60 °C	T85	70 °C	60 °C
T4, T3, T2, T1	60 °C	115 °C	T120	60 °C	115 °C
T3, T2, T1	50 °C	150 °C	T155	50 °C	150 °C

Minimum ambient air temperature (Ta) = -40 °C

Minimum process temperature (Tp) = -40 °C

c. Input parameters:

NAMUR electronics:

Ui = 15 V, Ii = 32 mA, Pi = 0.1 W, Ci = 12 nF, Li = 0.06 mH

8/16 mA electronics:

Ui = 30 V, Ii = 93 mA, Pi = 0.65 W, Ci = 12 nF, Li = 0.035 mH

d. Materials:

See the Rosemount 2120 [Product Data Sheet](#) or [Reference Manual](#).

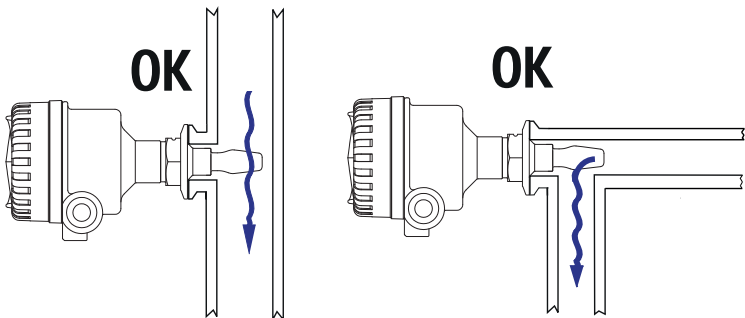
e. Year of manufacture: printed on product label

9. Special conditions of use
 - a. If the enclosure is made of an alloy or plastic material, the following precautions must be observed:
 - (i) The metallic alloy used for the enclosure material may be at the accessible surface of this equipment; in the event of rare accidents, ignition sources due to impact and friction sparks could occur. This shall be considered when the Rosemount 2120 is being installed in locations that specifically require Equipment Protection Level Ga or Da [ATEX: group II, category 1G equipment] [IECEX: in Zone 0 and 20 locations].
 - (ii) Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of the Rosemount 2120 may generate an ignition-capable level of electrostatic charge. Therefore, when they are used for applications that specifically require Equipment Protection Level Ga or Da [ATEX: group II, category 1G equipment] [IECEX: in Zone 0 and 20 locations], the Rosemount 2120 shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the Rosemount 2120 shall only be cleaned with a damp cloth.
 - b. Ensure the ambient air temperature (T_a) and the process temperature (T_p) are within the range detailed above for the T class of the specific explosive gases or vapors present.
 - c. Ensure the ambient air temperature (T_a) and the process temperature (T_p) are within the range detailed above for the maximum surface temperature of the specific explosive dusts present.

10.15 Instructions for hygienic installations

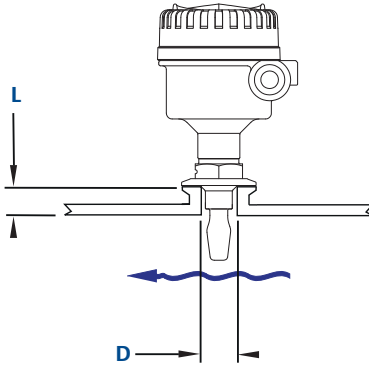
The following instructions are for a Rosemount 2120 Level Switch (“level switch”) with 38 mm or 51 mm Tri Clamp fitting covered by 3-A authorization 3496 and EHEDG certificate 102016, and ASME-BPE and FDA compliance:

1. The level switch is suitable for installation on pipeline (with fork gap in line with the flow) and on closed vessels (with the fork gap vertical).
EHEDG only recommend horizontal stub mounting in pipelines:



2. Installation of the level switch shall be carried out by suitably trained personnel, in accordance with the applicable standards and code of practice.

3. Inspection and maintenance of the level switch shall be carried out by suitably trained personnel, in accordance with the applicable standards and code of practice.
4. If the level switch is installed in a stub then, to ensure clean-ability, the length (L) must not exceed the diameter (D) with a minimum diameter of 46 mm. If the stub diameter is < 46 mm then $L < 2 * (D - 23)$.



5. The certification of the level switch relies upon the following materials used in its construction:
 - Product contact surfaces
 - Probe: Stainless steel 316/316L
 - d. Non-product contact surfaces:
 - Enclosure (Metal): Aluminum alloy ASTM B85 360.0 or ANSI AA360.0
 - Enclosure (plastic): Glass-filled (30%) nylon 66
 - Seals: Silicone, Nitrile rubber and polyethylene
 - Cable entry devices: Nylon (PA6)
6. It is the responsibility of the user to ensure:
 - a. The materials listed in instruction 5 are suitable for the media and cleaning (sanitizing) processes.
 - b. The level switch installation is drainable and cleanable.
 - c. That the joint requirements between the probe and the vessel/pipe are compatible with the process media, applicable standards and code of practice.
In EHEDG applications, the seals (gaskets) used shall be defined as in the EHEDG position paper "Easy cleanable pipe couplings and process connections".
 - d. That only suitable cable entry devices will be utilized when connecting the level switch to maintain IP66.
 - e. That any unused cable entries are sealed with suitable stopping plugs to maintain IP66.
7. The level switch is suitable for Cleaning-In-Place (CIP) up to 160 °F (71 °C).
8. The level switch is suitable for Steaming-In-Place (SIP) up to 275 °F (135 °C).

Figure 9. EU Declaration of Conformity for Rosemount 2120 (Page 1)




	EU Declaration of Conformity No: RMD 1078 Rev. H	
<p>We,</p> <p>Rosemount Measurement Limited 158 Edinburgh Avenue Slough, Berkshire, SL1 4UE United Kingdom</p>		
<p>declare under our sole responsibility that the product,</p> <p>Rosemount™ 2120 Series Vibrating Fork Liquid Level Switch</p> <p>manufactured by,</p> <p>Rosemount Measurement Limited 158 Edinburgh Avenue Slough, Berkshire, SL1 4UE United Kingdom</p>		
<p>to which this declaration relates, is in conformity with the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule.</p> <p>Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Union notified body certification, as shown in the attached schedule.</p>		
 _____ (signature)	_____ Global Approvals Manager (function)	
David Ross-Hamilton (name)	13/12/2017; Slough, GB (date of issue & place)	
<p>Page 1 of 4</p>		

Figure 10. EU Declaration of Conformity for Rosemount 2120 (Page 2)



	EU Declaration of Conformity	
No: RMD 1078 Rev. H		
EMC Directive (2014/30/EU)		
Rosemount 2120***K***** (Namur cassette) Harmonized Standards: EN 61326-1:2013; EN 61326-2-3:2013; EN 60947-5-6:2001		
Rosemount 2120***V***** (Relay Mains cassette)		
Rosemount 2120***G***** (PNP/PLC cassette)		
Rosemount 2120***H***** (8/16mA cassette) Harmonized Standards: EN 61326-1:2013; EN 61326-2-3:2013 Other Standards used: EN61326-3-1 :2008		
Rosemount 2120***E***** (Relay 12Vdc cassette)		
Rosemount 2120***T***** (Direct Load cassette) Harmonized Standards: EN 61326-1:2013; EN 61326-2-3:2013		
LV Directive (2014/35/EU)		
Rosemount 2120***V***** (Relay Mains cassette)		
Rosemount 2120***T***** (Direct Load cassette) Harmonized Standards: EN 61010-1:2010		
Page 2 of 4		

Figure 11. EU Declaration of Conformity for Rosemount 2120 (Page 3)



	<h2>EU Declaration of Conformity</h2> <p>No: RMD 1078 Rev. H</p>	
<p>ATEX Directive (2014/34/EU)</p> <p>Rosemount 2120***K*I1***** (Namur cassette) Rosemount 2120***H*I1***** (8/16mA cassette) Sira 05ATEX2130X – Intrinsically safe (Gas & Dust) Equipment Group II, Category 1 GD Ex ia IIC T5...T2 Ga Ex ia IIIC T85°C...T265°C Da Harmonized Standards: EN 60079-11:2012; EN 60079-26:2007 Other Standards Used: IEC 60079-0:2011</p> <p>Rosemount 2120***K*I8*****; Rosemount 2120***K*I8*****R2364 (Namur cassette) Rosemount 2120***H*I8*****; Rosemount 2120***H*I8*****R2634 (8/16mA cassette) Sira 05ATEX2130X – Intrinsically safe (Gas & Dust) Equipment Group II, Category 1/2G Ex ib IIC T5...T2 Ga/Gb Equipment Group II, Category 2D Ex ib IIIC T85°C...T265°C Db Harmonized Standards: EN 60079-11:2012; EN 60079-26:2007 Other Standards Used: IEC 60079-0:2011</p> <p>Rosemount 2120*****E1X*****; Rosemount 2120*****E1S***** (All cassettes, M20 conduits) Sira 05ATEX1129X – Flameproof Equipment Group II, Category 1/2 GD Ex db IIC T6...T2 Ga/Gb Ex tb IIIC T85°C...T265°C Db Harmonized Standards: EN 60079-0:2012/A11:2013; EN 60079-1:2014; EN 60079-26:2015; EN 60079-31:2014</p>		
<p>RoHS Directive (2011/65/EU)</p> <p>The Model 2120 is in conformity with Directive 2011/65/EU of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.</p>		
<p>(Minor variations in design to suit the application and/or mounting requirements are identified by alpha/numeric characters where indicated * above)</p>		
<p>Page 3 of 4</p>		

Figure 12. EU Declaration of Conformity for Rosemount 2120 (Page 4)

EMERSON **EU Declaration of Conformity** **CE**
No: RMD 1078 Rev. H

ATEX Notified Body

Sira Certification Service [Notified Body Number: 0518]
Unit 6, Hawarden Industrial Park,
Hawarden, CH5 3US, United Kingdom

ATEX Notified Body for Quality Assurance

Sira Certification Service [Notified Body Number: 0518]
Unit 6, Hawarden Industrial Park,
Hawarden, CH5 3US, United Kingdom

Page 4 of 4

含有China RoHS管控物质超过最大浓度限值的部件型号列表 Rosemount 2120
List of Rosemount 2120 Parts with China RoHS Concentration above MCVs

部件名称 Part Name	有害物质 / Hazardous Substances					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr +6)	多溴联苯 Polybrominated biphenyls (PBB)	多溴联苯醚 Polybrominated diphenyl ethers (PBDE)
电子组件 Electronics Assembly	O	O	O	O	O	O
壳体组件 Housing Assembly	O	O	O	O	O	O
传感器组件 Sensor Assembly	X	O	O	O	O	O

本表格系依据SJ/T11364的规定而制作。

This table is proposed in accordance with the provision of SJ/T11364.

O: 意为该部件的所有均质材料中该有害物质的含量均低于GB/T 26572所规定的限量要求。

O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: 意为在该部件所使用的均质材料里，至少有一类均质材料中该有害物质的含量高于GB/T 26572所规定的限量要求。

X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.



Global Headquarters

Emerson Automation Solutions

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

North America Regional Office

Emerson Automation Solutions

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

Latin America Regional Office

Emerson Automation Solutions

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

Europe Regional Office

Emerson Automation Solutions

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

Asia Pacific Regional Office

Emerson Automation Solutions

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

Middle East and Africa Regional Office

Emerson Automation Solutions

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



[Linkedin.com/company/Emerson-Automation-Solutions](https://www.linkedin.com/company/Emerson-Automation-Solutions)



[Twitter.com/Rosemount_News](https://twitter.com/Rosemount_News)



[Facebook.com/Rosemount](https://www.facebook.com/Rosemount)



[Youtube.com/user/RosemountMeasurement](https://www.youtube.com/user/RosemountMeasurement)



[Google.com/+RosemountMeasurement](https://www.google.com/+RosemountMeasurement)

Emerson Terms and Conditions of Sale are available upon request.
The Emerson logo is a trademark and service mark of Emerson Electric Co.
Rosemount is a mark of one of the Emerson family of companies.
All other marks are the property of their respective owners.
© 2018 Emerson. All rights reserved.