Quick Start Guide
00825-0100-4029, Rev CD
March 2023

Rosemount™ 2110 Level Switch

Vibrating Fork

ROSEMOUNT™

EMERSON.

Contents

1 About this guide

This Quick Start Guide provides basic guidelines for the Rosemount 2110. Refer to the Rosemount 2110 Reference Manual for more instructions. The manual and this guide are also available electronically at Emerson.com/Rosemount.

1.1 Safety messages

⚠ WARNING

Failure to follow safe installation and servicing guidelines could result in death or serious injury.

Ensure the level switch is installed by qualified personnel and in accordance with applicable code of practice.

Use the level switch only as specified in this manual. Failure to do so may impair the protection provided by the level switch.

Repair, e.g. substitution of components, etc. may jeopardize safety and is under no circumstances allowed.

⚠ WARNING

Explosions could result in death or serious injury.

The level switch must only be installed and operated in non-hazardous (ordinary) locations.

⚠ WARNING

Electrical shock could cause death or serious injury.

Ensure the power to the level switch is off, and the lines to any other external power source are disconnected or not powered while wiring the level switch.

Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

Ensure the wiring is suitable for the electrical current and the insulation is suitable for the voltage, temperature, and environment.

⚠ WARNING

Process leaks could result in death or serious injury.

Ensure the level switch is handled carefully. If the process seal is damaged, gas might escape from the vessel (tank) or pipe.

⚠ WARNING

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

⚠ CAUTION

Hot surfaces

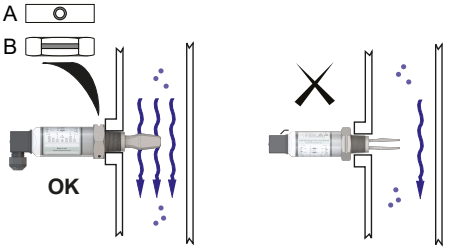
The flange and process seal may be hot at high process temperatures. Allow to cool before servicing.

2 Installation

2.1 Fork alignment in a pipe installation

The fork is correctly aligned by positioning the groove or notch as indicated (Figure 2-1).

Figure 2-1: Correct Fork Alignment for Pipe Installation

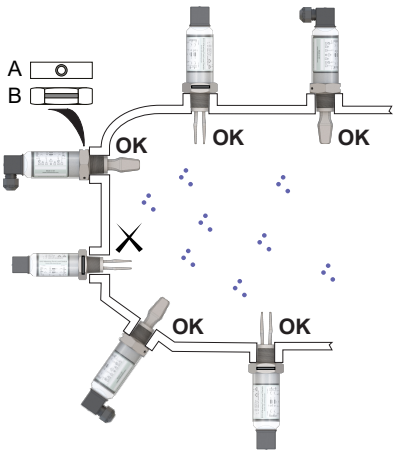


A. Tri Clamp process connections have a circular notch
B. Threaded process connections have a groove

2.2 Fork alignment in a vessel (tank) installation

The fork is correctly aligned by positioning the groove or notch as indicated (Figure 2-2).

Figure 2-2: Correct Fork Alignment for Vessel (Tank) Installation



A. Tri Clamp process connections have a circular notch
B. Threaded process connections have a groove

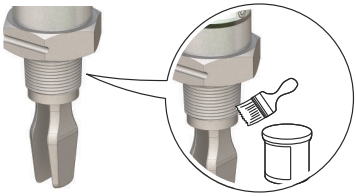
2.3 Mounting the threaded version

2.3.1 Threaded vessel (tank) or pipework connection

Procedure

1. Seal and protect the threads. Use anti-seize paste or PTFE tape according to site procedures.

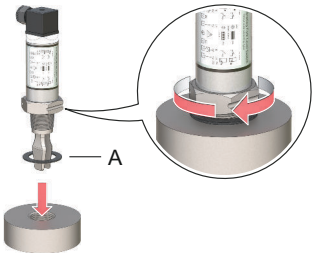
   A gasket may be used as a sealant for BSPP (G) threaded connections.



2. Screw the level switch into the process connection.

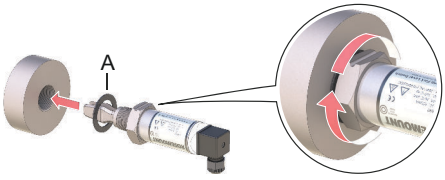
Note
Tighten using the hexagon nut only.

Figure 2-3: Vertical Installation



A. Gasket for BSPP (G) threaded connection

Figure 2-4: Horizontal Installation

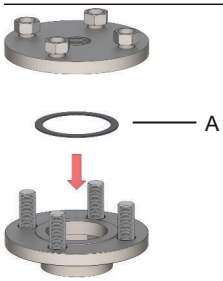


A. Gasket for BSPP (G) threaded connection

2.3.2 Threaded flange connection

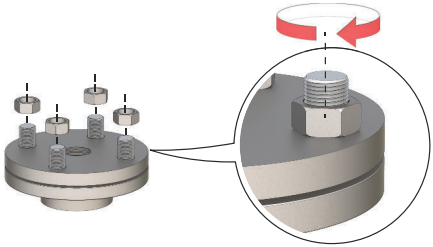
Procedure

1. Place the customer-supplied flange and gasket on the vessel (tank) nozzle.



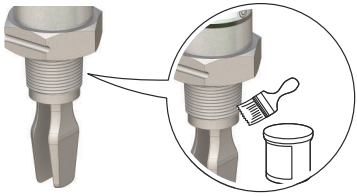
A. Gasket (customer supplied)

2. Tighten the bolts and nuts with sufficient torque for the flange and gasket.



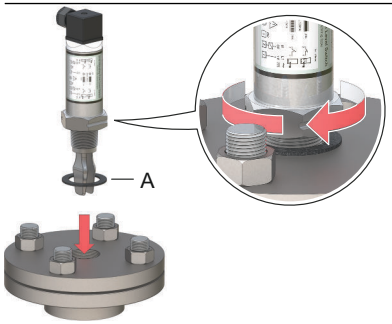
3. Seal and protect the threads. Use anti-seize paste or PTFE tape according to site procedures.

   A gasket may be used as a sealant for BSPP (G) threaded connections.



4. Screw the level switch into the flange thread.

Note
Tighten using the hexagon nut only.

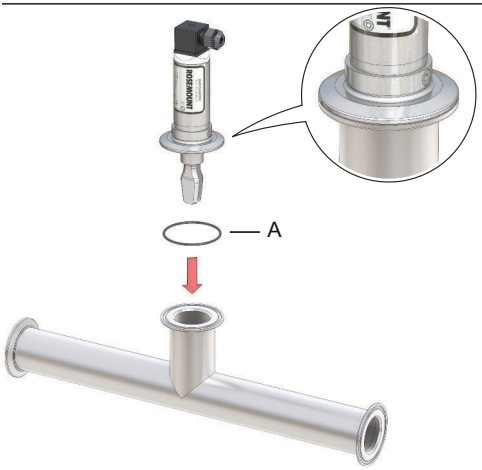


A. Gasket for BSPP (G) threaded connection

2.4 Mounting the Tri Clamp version

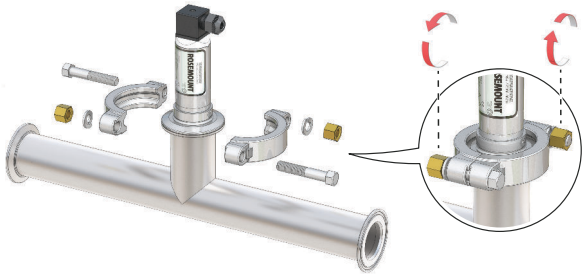
Procedure

1. Lower the level switch into the flange face.



A. Seal (supplied with Tri Clamp)

2. Fit the Tri Clamp.



Note
The Tri Clamp and seal are supplied in an accessory kit that has to be ordered separately. See the Rosemount 2110 Product Data Sheet for ordering information.

3 Prepare the electrical connections

3.1 Cable selection

Twisted-pairs and shielded wiring is recommended for environments with high EMI (electromagnetic interference). Two wires can be safely connected to each terminal screw. Maximum wire size is 15 AWG.

3.2 Cable glands/conduits

The cable gland is integrated in the four-position plug of the level switch. Do not make any modifications to the level switch.

3.3 Electronics options

Figure 3-1: Direct Load Switching – Electronics Option Code 0

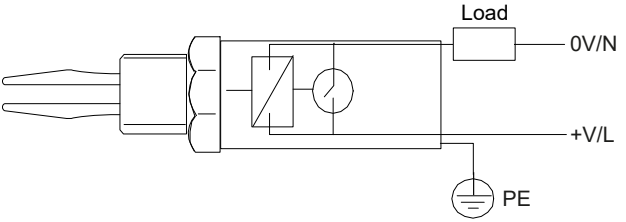


Table 3-1: Electrical Parameters – Electronics Option Code 0

Parameter	Value
Load switching	ac/dc
Direct load switching	ac/dc
Maximum switched load	500 mA
Maximum peak load	5 A for 40 ms maximum
Minimum switched load	20 mA continuous
Voltage drop	6.5 V @ 24 Vdc or 5 V @ 240 Vac
Current draw (load off)	< 3 mA continuous

Figure 3-2: PNP Switching – Electronics Option Code 1

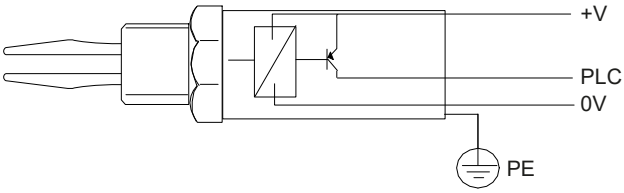


Table 3-2: Electrical Parameters – Electronics Option Code 1

Parameter	Value
PNP output	dc
PNP for PLC/SPS connection	dc
Maximum switched load	500 mA
Maximum peak load	5 A for 40 ms maximum
Voltage drop	< 3 V
Supply current	3 mA nominal
Output current (load off)	< 0.5 mA

3.4 Power supply

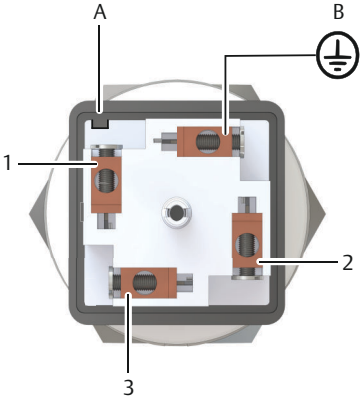
The Direct Load electronics operate on 21 - 264 Vdc or 21 - 264 Vac (50/60 Hz) at the level switch terminals.

The PNP electronics operate on 18 - 60 Vdc at the level switch terminals.

3.5 Mode selection

Table 3-3 and Table 3-4 show how the mode selection is determined from the wiring connections. Modes are “Dry on, high level alarm” and “Wet on, low level alarm”.

Figure 3-3: Wiring Connections Orientation



A. Orientation cut-out
B. PE (ground)

Table 3-3: Mode Selection By Customer Wiring – Electronics Option Code 0

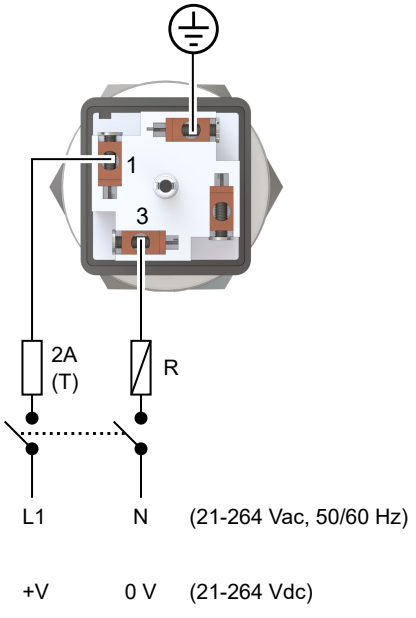
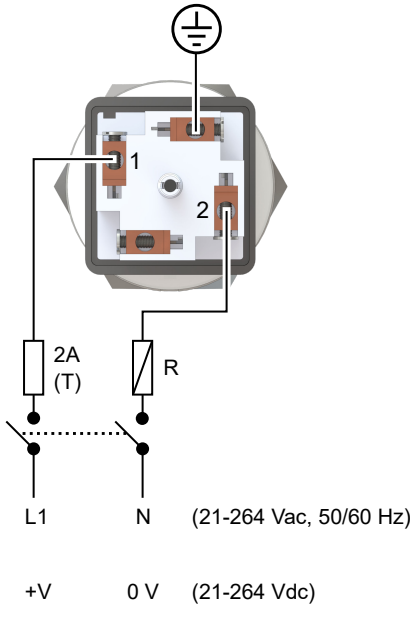
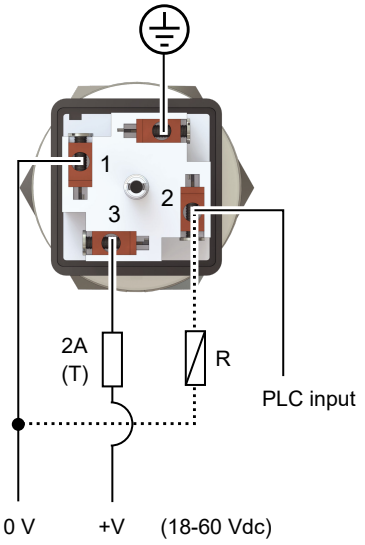
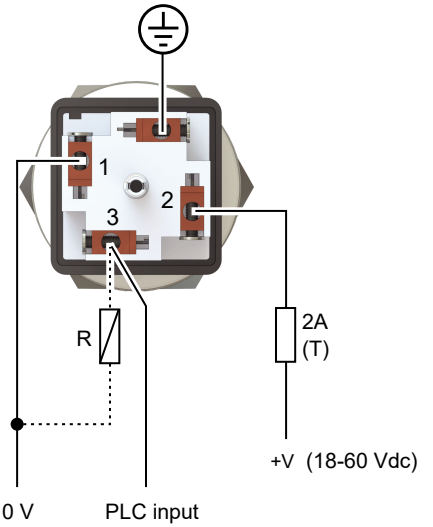
Mode: dry on, high level alarm	Mode: wet on, low level alarm
	
 R = external load (must be wired)	

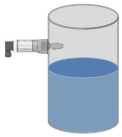
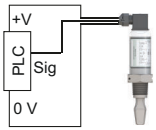
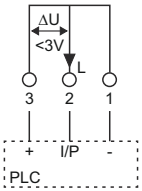
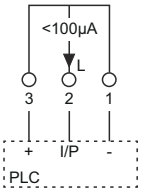
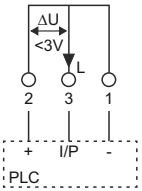
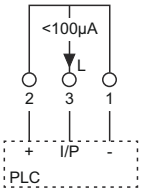
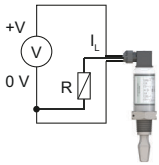
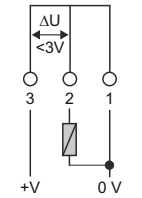
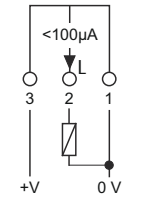
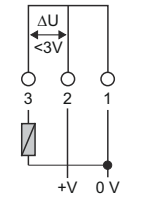
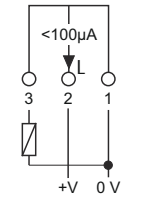
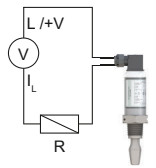
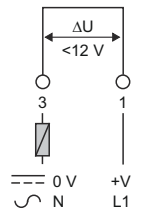
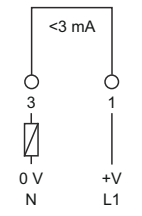
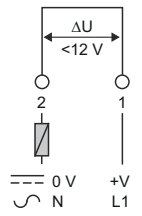
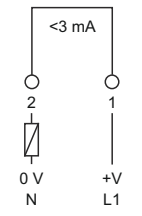
Table 3-4: Mode Selection By Customer Wiring – Electronics Option Code 1

Mode: dry on, high level alarm	Mode: wet on, low level alarm
	
 R = external load	

3.6 Functions

Table 3-5 shows the switched electrical outputs from the PNP and Direct Load electronics for each mode selection.

Table 3-5: Functions

	Mode: dry on, high level alarm		Mode: wet on, low level alarm	
				
PLC (positive output)				
				
PNP dc				
				
Load switching ac/dc				
				
LED				
	 LED on continuously	 LED flashes every second	 LED on continuously	 LED flashes every second
Electrical load				
	 = Load on  = Load off			

Note
For direct load switching, a DPST (Double Pole, Single Throw) (on/off) switch must also be fitted for safe disconnection of the power supply. Fit the DPST switch as near to the Rosemount 2110 as possible, keeping the switch free of obstructions. Label the switch to indicate it is the supply disconnection device for the Rosemount 2110.

3.6.1 Relay connection warning (for direct load switching)

The Rosemount 2110 requires a minimum current of 3 mA, which continues to flow when it is 'off'. When selecting a relay to wire in series with the Rosemount 2110, the drop-out voltage of the relay must be greater than the voltage generated across the relay coil when 3 mA flows through it.

3.7 Grounding

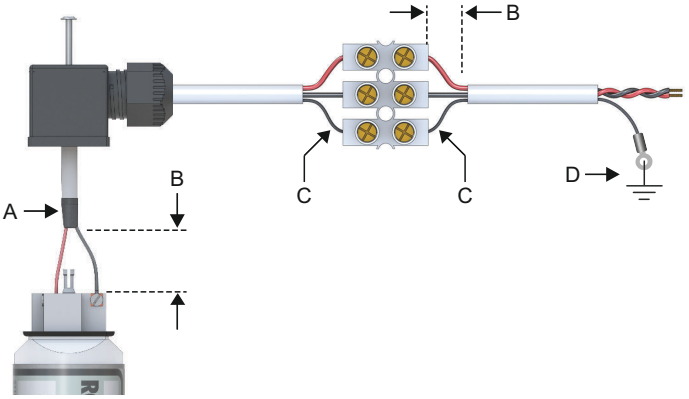
Make sure grounding is done according to national and local electrical codes. Failure to do so may impair the protection provided by the equipment.

3.7.1 Signal cable shield grounding at power supply end

Make sure the instrument cable shield is:

- Trimmed close and insulated from touching the housing.
- Continuously connected throughout the segment.
- Connected to a good earth ground at the power supply end.

Figure 3-4: Signal Cable Shield Grounding at Power Supply End



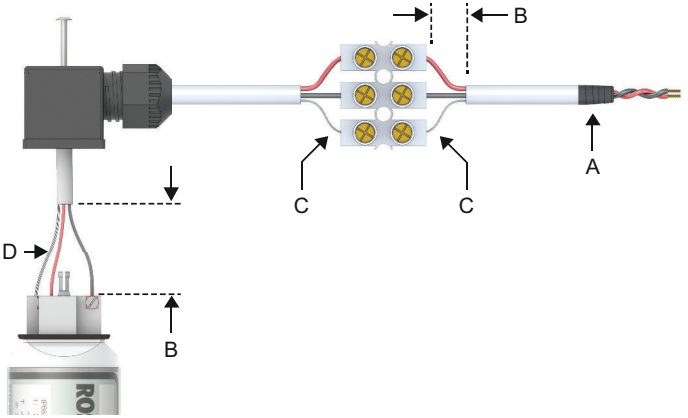
A. Trim shield and insulate
B. Minimize distance
C. Trim shield
D. Connect shield back to the power supply ground

3.7.2 Signal cable shield grounding at instrument end

Make sure the instrument cable shield is:

- Trimmed close and insulated at the power supply end.
- Continuously connected throughout the segment.
- Connected to the potential earth (ground) terminal at the instrument end.

Figure 3-5: Signal Cable Shield Grounding at Instrument End



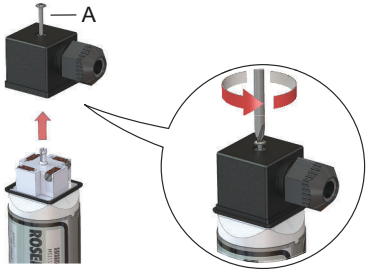
A. Trim shield and insulate
B. Minimize distance
C. Trim shield
D. Connect shield ground at instrument end

4 Connect wiring and power up

The Rosemount 2110 meets IP66 and IP67 weatherproof ratings when correctly assembled with the supplied connector and suitable cable. Ensure seals are in place to maintain the weatherproof ratings.

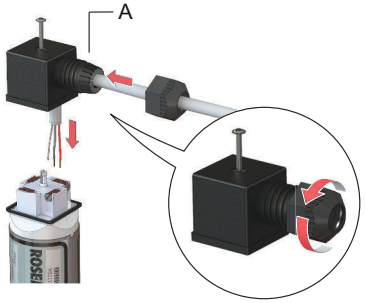
Procedure

1. ⚠ Verify the power supply is disconnected.
2. Remove the plug cover and cable gland.
   Keep the fixing screw and screw seal safe.



A. Fixing screw and screw seal

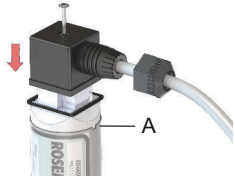
3. Pull the cable through the cable gland.
   Cable diameter: 0.24 to 0.31 in. (6 to 8 mm)

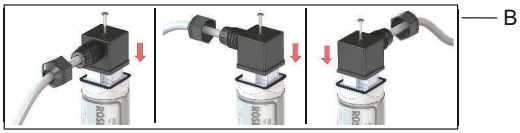


A. PG9 cable gland provided

4. Connect the cable wires.
   Table 3-3 and Table 3-4 show the wiring connections for each electronics option.
5. Ensure proper grounding.
6. Re-fit the plug cover and tighten the cable gland.

a) The plug cover can be re-fitted in any one of four positions.

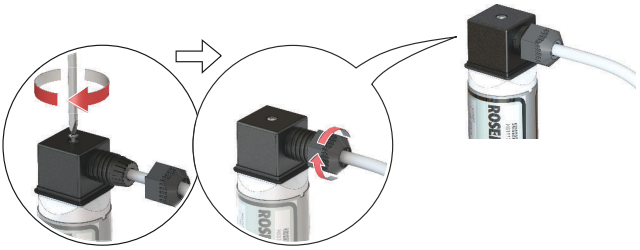




A. Fork alignment indicator
B. Optional plug positions

b) Ensure the cable gland is pointing downwards or sideways.

c) Secure the plug cover with the plug screw and washer, and tighten cable gland.



d) If possible, arrange the wiring with a drip loop.

7. Connect the power supply when ready to apply power.

5 Product certifications

Rev 2.10

5.1 European directive and UKCA regulations information

A copy of the EU/UK Declaration of Conformity can be found at the end of this document. The most recent revision of the EU/UK Declaration of Conformity can be found at Emerson.com/Rosemount.

5.2 Environmental conditions

Table 5-1: Environmental Conditions Low Voltage Directive (LVD)

Type	Description
Location	Indoor or outdoor use
Maximum altitude	6562 ft. (2000 m)
Ambient temperature	-40 to 176 °F (-40 to 80 °C)
Overvoltage category	II
Electrical supply/load	24-240 Vac, 50/60 Hz or 24-240 Vdc or 20-54 Vdc, 500 mA
Mains supply voltage fluctuations	Safe at ±10%
Pollution degree	2

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

3-A® (authorization 3626) and EHEDG (certificate: C2200010)

ASME-BPE, FDA, and EC 1935/2004 compliant

Related information

Instructions for hygienic installations

5.4 Overfill approval

Certificate Z-65.11-236

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.

5.5 Canadian Registration Number (CRN)

Certificate 0F04227.2C

The requirements of CRN are met when a Rosemount 2110 is configured with a NPT threaded process connection.

5.6 Technical Regulations Customs Union (TR-CU)

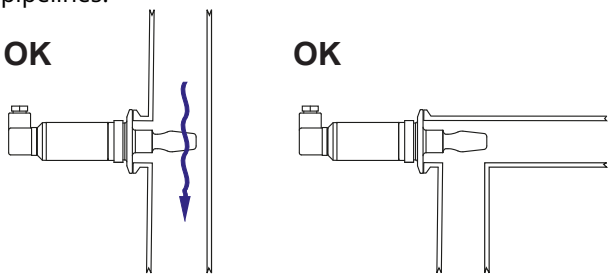
TR TC 032/2013 "On the safety equipment of high pressure"

Certificate ЕАЭС N RU Д-SE.PA01.B.01263_21 (Self Declaration)
ЕАЭС RU C-SE.АБ53.B.00581_21

5.7 Instructions for hygienic installations

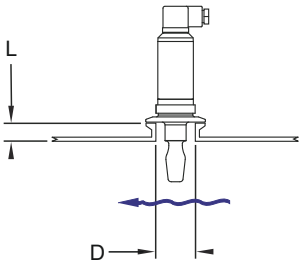
The following instructions are for a Rosemount 2110 Level Switch (“level switch”) with a 51 mm Tri Clamp fitting covered by 3-A authorization 3626 and EHEDG certificate C2200010, and ASME-BPE and FDA compliance:

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 this equipment shall be carried out by suitably trained personnel, in accordance with the applicable code of practice.
3. Inspection and maintenance of this equipment shall be carried out by suitably trained personnel, in accordance with the applicable code of practice.

4. If the level switch is installed in a stub then to ensure cleanability, the length (L) must meet the criteria L < (D − 23), where D is the stub diameter.



5. The certification of the level switch relies upon the following materials used in its construction:
   a. Product contact surfaces
      - Probe: Stainless steel 316/316L

   b. Non-product contact surfaces
      - Enclosure: Stainless steel 304 type
      - Lens: Nylon 12
      - Seals: Nitrile rubber
      - Connector: 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 (sanitisation) processes.
   b. The installation of the level switch 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 should be as defined in the EHEDG position paper “Easy cleanable pipe couplings and process connections”.

7. Cleaning-In-Place (CIP) routines up to 160 °F (71 °C) are suitable for the level switch.
8. Steaming-In-Place (SIP) routines up to 302 °F (150 °C) are suitable for the level switch.

5.8 EU/UK Declaration of Conformity

Figure 5-1: EU/UK Declaration of Conformity

Rev. #2

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Declaration of Conformity

CE / UKCA

We,

Rosemount Tank Radar AB
Layoutvägen 1
S-43533 Mölnlycke
Sweden

declare under our sole responsibility that the product,

Rosemount™ 2110 Compact Vibrating Fork Liquid Level Switch

manufactured by

Rosemount Tank Radar AB
Layoutvägen 1
S-43533 Mölnlycke
Sweden

to which this declaration relates, is in conformity with:

1) the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule.

2) the relevant statutory requirements of Great Britain, including the latest amendments, as shown in the attached schedule.

(signature)	2023-01-27, Mölnlycke (date of issue & place)	Dajana Prastalo (name)	Sr. Manager Product Approvals (function)

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Declaration of Conformity

CE / UK CA

EMC Directive (2014/30/EU)

Rosemount 21100**; Rosemount 21101******

Harmonized Standards:
EN 61326-1:2013, EN 61326-2.3:2013

Other Standards used
IEC 61326-1:2020

Electromagnetic Compatibility Regulations 2016 (S.I. 2016/1091)

Rosemount 21100**; Rosemount 21101******

Designated Standards:
EN 61326-1:2013, EN 61326-2.3:2013

Other Standards used
IEC 61326-1:2020

LV Directive (2014/35/EU)

Rosemount 21100****

Harmonized Standards:
EN 61010-1:2010 + A1:2019 + AC:2019-04

Electrical Equipment (Safety) Regulations 2016 (S.I. 2016/1101)

Rosemount 21100****

Designated Standards:
EN 61010-1:2010 + A1:2019 + AC:2019-04

RoHS Directive (2011/65/EU)

The Model 2110***** 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.

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The Model 2110***** 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.

(Minor variations in design to suit the application and/or mounting requirements are identified by alpha/numeric characters where indicated * above)

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5.9 China RoHS

含有China RoHS管控物质超过最大浓度限值的部件型号列表 Rosemount 2110
List of Rosemount 2110 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所有均质材料里，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.

Quick Start Guide
00825-0100-4029, Rev. CD
March 2023

For more information: **Emerson.com**

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