

Rosemount 2120 Vibrating Fork Liquid Level Switch for high level alarm in storage tanks

BENEFITS

- Reliable high level alarm switch for storage tanks
- Self-checking tuning fork operation principle
- Hazardous area certification from ATEX, CSA, and UL
- Explosionproof or SIL2 I.S. models available
- Fixed height or site adjustable switching point



Application

Detection and alarm of high liquid level in Hydrocarbon storage tanks.

Challenge

The objective is to detect and prevent tank overfilling and subsequent spillage. Should the liquid level rise to the high alarm level, a signal is needed to shut any feed line valves or pumps.

Solution

The Rosemount Extended length 2120 is fitted to a nozzle at the tank roof, either directly or by use of an adjustable clamp gland. This tuning fork style switch is designed to vibrate the forks at their natural frequency. Should the liquid level rise to the high level height, the forks become immersed in the liquid and the frequency of vibration changes. The built-in control electronics detects this change and indicates an alarm condition by switching the output.

Explosionproof models with a selection of electronic outputs, and an IS model which connects to a local isolation amplifier, are available.



Floating roof tank with the Rosemount 2120 liquid level alarm switch.

Rosemount 2120 Alarm Switch

Specification			
Product	Rosemount 2120 Vibrating Fork Liquid Level Switch.		
Measuring Principle	Fast-drip-off vibrating fork.		
Fork Length	2 in. (50 mm) to 118 in. (3 m).		
Special Features	<p>Mode switch / Adjustable time delay: Rosemount 2120 can be set to switch if the forks get either wet (typically high alarm) or dry (typically low alarm). The time delay is selectable: 0.3, 1, 3, 10 or 30 s (dry to wet / wet to dry).</p> <p>Heartbeat LED: The status indicating LED gives constant indication of whether or not the Rosemount 2120 is functioning correctly. The LED is constantly lit when the switch is on and it flashes if it is off.</p> <p>Magnetic Test point: The test point, located on the side of the housing, can be used for alarm simulation.</p>		
Housing Material	Plastic, Aluminum alloy, or 316 SST (stainless steel).		
Conduit Entry	Two cable / conduit entries, M20, 1/2-in. or 3/4-in. NPT.		
Terminal Connection	Wire diameter max. 0.1 in ² (2.5 mm ²). National regulations.		
Electrical Connection & Power Supply	<p>Direct Load Switching (two-wire): U=20 to 264 VAC (50/60 Hz) or 20 to 60 VDC. I_{OFF} < 3 mA, I_L=20-500 mA. Rosemount 2120 is connected in series with a load to achieve direct load switching.</p> <p>Solid state PNP output for direct interface to PLC's (3-wire): U=20 to 60 VDC. I_{L(max)}=0-500 mA.</p> <p>SPCO single relay for voltage free contacts:</p> <p>In: U=20 to 264 VAC (50/60 Hz), I < 6 mA.</p> <p>Out: U_{max}=250 VAC (50/60 Hz) or 60 VDC. I_{max}=5 A if U_{max} < 30 VDC, otherwise I_{max}=1.5 A.</p> <p>Intrinsically Safe (IS) NAMUR, DIN 19234, IEC 60947-5-6: I_{ON} = 2.2 to 2.5 mA, I_{OFF}=0.8 to 1.0 mA</p>		
Protection	<p>Rosemount 2120 is polarity insensitive and has over-current, short-circuit and load-missing protection.</p> <ul style="list-style-type: none"> Ingress protection: IP 66/67 or Type 4X. Surge protection according to IEC61326. 		
Process Connection	<table border="0"> <tr> <td style="vertical-align: top;"> <p>Threaded</p> <ul style="list-style-type: none"> • 3/4-in. BSP or NPT • 1-in. BSP or NPT </td> <td style="vertical-align: top;"> <p>Flanges</p> <ul style="list-style-type: none"> • ANSI, 1.5-4 in. 150-600 lb • DIN (EN), DN 40-100, PN 10/16-100 </td> </tr> </table>	<p>Threaded</p> <ul style="list-style-type: none"> • 3/4-in. BSP or NPT • 1-in. BSP or NPT 	<p>Flanges</p> <ul style="list-style-type: none"> • ANSI, 1.5-4 in. 150-600 lb • DIN (EN), DN 40-100, PN 10/16-100
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Wetted Material	316L SST (EN 1.4404) or Hastelloy C.		
Maximum Process Pressure	-3.62 psig (-0.25 barg) to 1450 psig (100 barg), depending on the process temperature. Note: If the Rosemount 2120 switch is used with a clamp gland, max. operating pressure is limited to 18.85 psig (1.3 barg).		
Maximum Process Temperature	-140 °F to 302 °F (-140 °C to 150 °C), depending on the ambient temperature.		
Liquid Density Range	Minimum 37.5 lb/ft ³ (600 kg/m ³).		
Liquid Viscosity Range	0.2 to 10,000 cP (centiPose).		
Hysteresis (water)	± 0.039 in. (± 1 mm) nom.		
Switching Point (water)	0.5 in. (13 mm) from tip (vertical) / from edge (horizontal) of fork (this will vary with different liquid densities).		
Certification	<p>FM Explosion Proof Approval: Explosion Proof for Class I, Div. 1, Groups A, B, C and D. T6. 4X.</p> <p>FM IS Approval: Intrinsically Safe for Class I, Div. 1, Groups A, B, C and D Class I, Zone 0, AEx ia IIC. T5.</p> <p>CSA Explosion Proof Approval: Explosion Proof for Class I, Div. 1, Groups A, B, C, and D. T6.</p> <p>CSA IS Approval: Intrinsically Safe for Class I, Div. 1, Groups A, B, C, and D Class 1, Zone 0, Ex ia IIC. T5.</p> <p>CSA Non-Incendive Approval: Non-Incendive for Class I, Div. 2, Groups A, B, C, and D. T5.</p> <p>ATEX Flameproof Approval: II 1/2 G D EEx d IIC T6.</p> <p>ATEX IS Approval: II 1 G D EEx ia IIC T5.</p> <p>Electro Magnetic Compatibility (EMC) Directive: EN61326 Emissions to Class B.</p> <p>Vibration Resistance: EN60721 level 3M6/4M6.</p> <p>Overfill Protection: Approved by DIBt/WHG.</p> <p>SIL Declaration of Conformity: SIL 2, IEC 61508 (Type B).</p>		

Technical details are subject to change without prior notice. For more technical details, see the Rosemount Product Data Sheet 00813-0100-4030.

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