

Replacement and Calibration of Electronic Spare (PCB) Cassettes - Rosemount 2120 Vibrating Fork Liquid Level Switch

Refer to the Rosemount 2120 Vibrating Fork Level Switch manual (00809-0100-4030) for additional instructions.

CAUTION

- Protection afforded by compliance to EN61010-1 (2001) may be impaired if the equipment is not used as specified. The Rosemount 2120 is a liquid level switch. It must be installed, connected, commissioned, operated and maintained by suitably qualified personnel only, observing any national and local requirements that may apply.

Electrical shock could cause death or serious injury.

- If the level switch is installed in a high voltage environment and a fault condition or installation error occurs, high voltage may be present on switch leads and terminals.
- Use extreme caution when making contact with the leads and terminals.

Replacement and Calibration of Electronic (PCB) Cassettes

When replacing a damage or faulty cassette, it is necessary to calibrate the cassette with the operating frequency of the fork assembly. This is a list of actions required to enable calibration to occur. Please make sure you understand them prior to starting. Calibration sequence steps 3 to 13 are time dependent and must be carried out within the noted times. The time dependency and switching sequence is to prevent an accidental calibration occurring.

If this replacement is taking place in a (Potentially Explosive Atmosphere) Hazardous Area, a suitably qualified person must carry it out. All work in hazardous areas must be carried out in accordance to local code of practice. For general hazardous area requirements for this equipment, refer to the Rosemount 2120 manual (00809-0100-4030).

This calibration routine takes a bit of practice; do not be surprised if the unit does not calibrate after the first attempt.



Rosemount 2120

Replacement Sequence

On I.S. units, it is recommended that replacement and calibration be performed in a safe (non-hazardous) area.

NOTE:

I.S. cassettes can only be replaced with I.S. cassettes.

Non-I.S. cassette types can be interchanged with other non-I.S. cassettes, but the new label must be fitted and the original part number transferred to the new label.

Before starting the replacement and calibration procedure, ensure that any controlled process will not be adversely affected.

To replace the cassette, do the following:

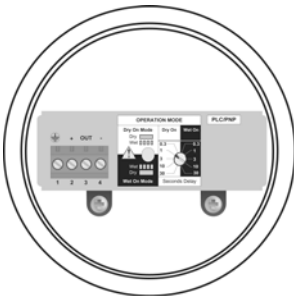
1. Isolate and disconnect the power to the 2120. Insulate ends of the wires.

NOTE:

On relay units, there may be more than one power source.

2. Remove the screwed-on lid and disconnect the wires, noting connections (Figure 1). Also, note the exact Mode switch position (Figure 2) on the cassette that is to be replaced.
3. Remove and retain the two fixing screws from the base of the cassette and unplug the cassette.
4. Plug in the replacement cassette, refit the screws, reconnect the wires and set the Mode switch to Wet = ON with a one second delay (Figure 3).
5. Reconnect the power to the unit. (Reverse step 1).

Figure 1. Cassette to be replaced.



Manual Supplement

00809-0200-4030, Rev AA
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Figure 2. Mode switch set to Dry = ON, 1 second delay. This is an example of how the existing cassette may look. Take note of the actual setting.

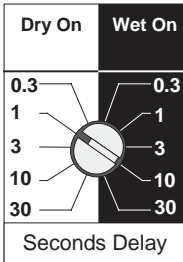
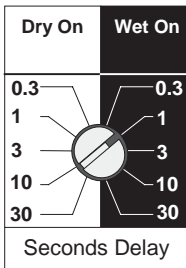


Figure 3. Mode switch of replacement cassette set to Wet = ON, 1 second delay.



NOTE:
Switching time delay: 0.3, 1, 3, 10 or 30 seconds
(mode switch selection)
Status Indication LED: On continuous: Output ON
One flash per second: Output OFF
One flash every 4 seconds: Load Fault
(Current too high, short circuit or load omitted)

Calibration Sequence

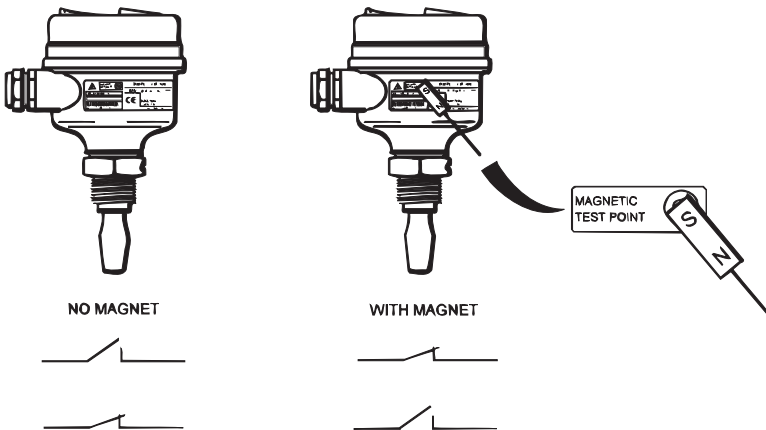
To calibrate the cassette, do the following:

1. Ensure that the sensor forks are completely dry and the mode switch is set to Wet = On, time delay 1 second.
2. Check that the LED is flashing at one flash per second. If it is on continuously, proceed to step 8.
3. Apply magnet to test point. With the housing conduit nearest to you, the test point can be found halfway down the housing on the right hand side in line with the PCB cassette. On the external housings, a target indicates this. See Figure 4.
4. After a one second delay, the LED will light continuously.
5. Within three seconds rotate the Mode switch two steps clockwise.
6. After a two second delay, the LED will go out.
7. Within three seconds, rotate the Mode switch two steps anti-clockwise. Proceed to step 13.
8. Apply magnet to test point, indicated by a target on external label (Figure 4). By touching a magnet on the target the 2120 output will change state for as long as the magnet is present.
9. After a one second delay, the LED will flash at one flash per second.
10. Within three seconds, rotate the Mode switch two steps clockwise.
11. After a two second delay, the LED will go out (stop flashing).
12. Within three seconds, rotate the Mode switch two steps anti-clockwise.
13. After a two second delay, the LED should flash twice per second.

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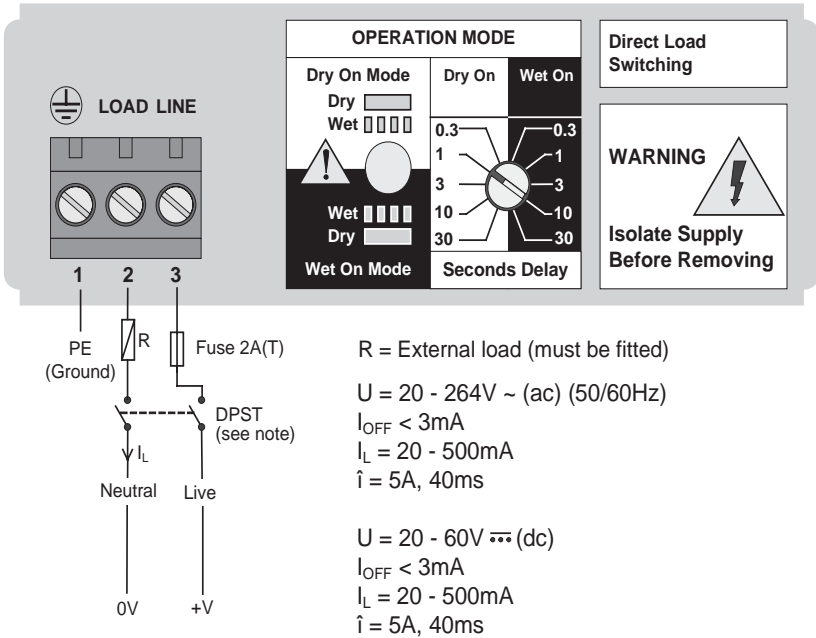
14. If the LED is flashing twice per second, the calibration has occurred correctly. Remove the magnet. After a one second delay, the unit will return to normal operation. Proceed to step 17.
15. If the LED is flashing once per second or it is on continuously, the calibration has failed. If this occurs, remove the magnet, wait ten seconds and then repeat from step 2 onwards.
16. If the LED stays off after the two second delay of step 13, the sensor is not working correctly. Check that the sensor forks are clean and dry. Also, check that there is nothing jammed in or touching the sensor. If no fault is found with the sensor, the entire unit should be returned for repair.
17. Set the Mode switch to the setting noted in step 2 of the Replacement Sequence. Wait five seconds for the new setting to be acted upon.
18. Replace the lid and check the system works.

Figure 4. Magnetic test point



2120 Direct Load Switching (2-Wire, Red label)

- Direct load switching (2-wire Red)



NOTE:

DPST = 'Double Pole, Single Throw' (on/off) switch - must be fitted for safe disconnection of the power supply. Fit the switch as near to the 2120 as possible. Keep the switch free of obstructions. Label the switch to indicate that it is the supply disconnection device for the 2120.

RELAY CONNECTION WARNING:

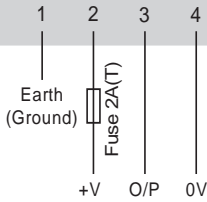
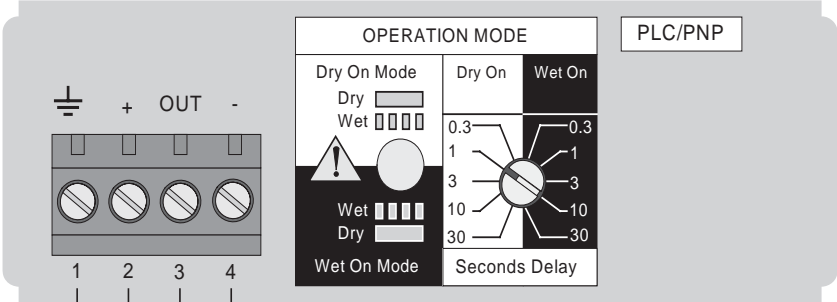
The Rosemount 2120 requires a minimum current of 3mA, which continues to flow when the 2120 is 'off'. If selecting a relay to wire in series with the 2120, the user must ensure that the drop-out voltage of the relay is greater than the voltage which will be generated across the relay coil when 3mA flows through it.

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High level Dry = ON		Low level Wet = ON	
<p>Seconds Delay</p>		<p>Seconds Delay</p>	
<p>ΔU 12V</p> <p>Fuse 2A(T)</p> <p>DPST</p> <p>N 0V L +V</p>	<p>$<3mA</math>$</p> <p>Fuse 2A(T)</p> <p>DPST</p> <p>N 0V L +V</p>	<p>ΔU 12V</p> <p>Fuse 2A(T)</p> <p>DPST</p> <p>N 0V L +V</p>	<p>$<3mA</math>$</p> <p>Fuse 2A(T)</p> <p>DPST</p> <p>N 0V L +V</p>
LED on continuously	LED flashes every second	LED on continuously	LED flashes every second

PNP/PLC Version

- PNP output for load switching and direct PLC switching (3-wire Yellow)



$U = 20 - 60V \overline{\overline{\overline{\text{dc}}}}$
 $I < 4mA + I_L$

$I_{L(MAX)} = 0 - 500mA$
 $\hat{i} = 5A, 40ms$

$U_{OUT(ON)} = U - 2.5V$

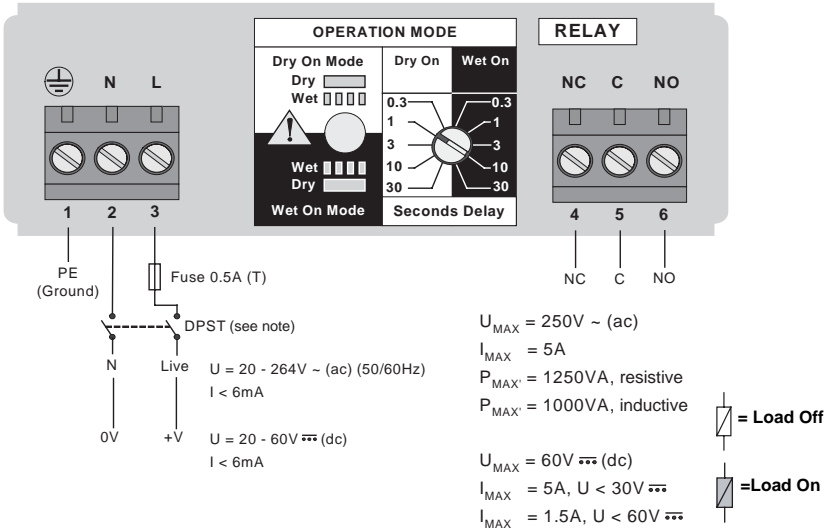
$I_{L(OFF)} < 100\mu A$

Rosemount 2120

		High level Dry = ON		Low level Wet = ON	
PLC (positive input)					
	PNP dc				
		<p>LED on continuously</p>	<p>LED flashes every second</p>	<p>LED on continuously</p>	<p>LED flashes every second</p>

Replay Output

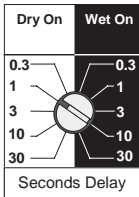
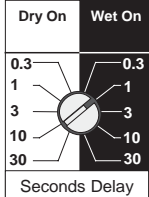
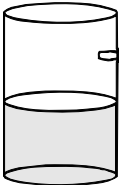
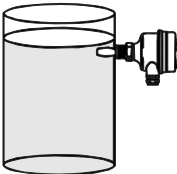
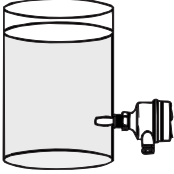
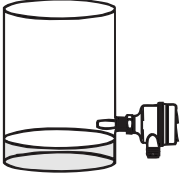




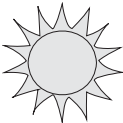

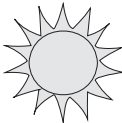
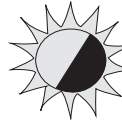
- Relay output, SPCO (Green label)



NOTE:

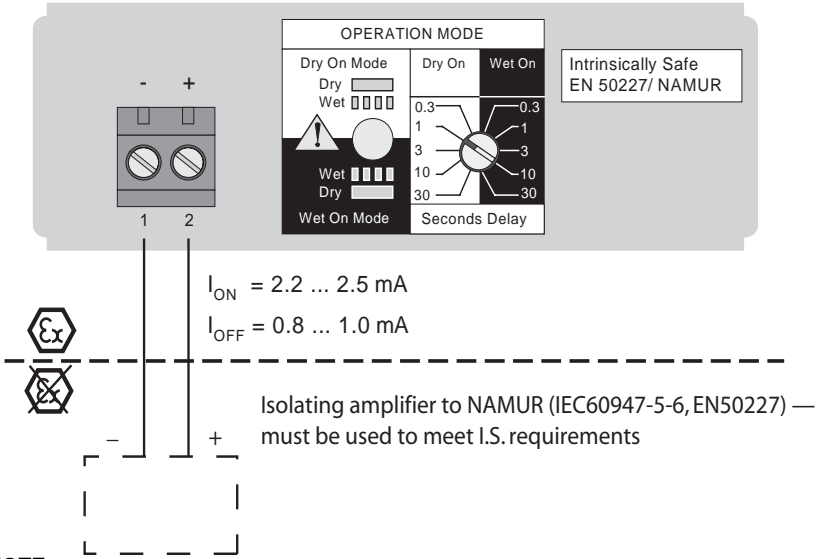
DPST = 'Double Pole, Single Throw' (on/off) switch - it must be fitted for safe disconnection of the power supply. Fit the switch as near to the 2120 as possible. Keep the switch free of obstructions. Label the switch to indicate that it is the supply disconnection device for the 2120.

Rosemount 2120

High level Dry = ON		Low level Wet = ON	
			
			
			
 LED on continuously	 LED flashes every second	 LED on continuously	 LED flashes every second

Intrinsically Safe NAMUR

- Intrinsically safe NAMUR (Blue label and cassette)



NOTE:

This I.S. cassette can not be interchanged with any other cassette.

Rosemount 2120

High level Dry = ON		Low level Wet = ON	
LED on continuously	LED flashes every second	LED on continuously	LED flashes every second

Troubleshooting

If there is a malfunction, see Table 1 for information on possible causes.

Table 1. Troubleshooting chart.

Fault	Symptom/Indication	Action/Solution
Does not switch	<ul style="list-style-type: none"> • No LED; no power • LED 3 flashes per second • LED 1 flash every 2 seconds • LED 1 flash every 4 seconds • Fork damaged • Thick encrustation on forks • 5 second delay on changing mode/delay 	<ul style="list-style-type: none"> • Check the power supply; (check load on direct load switching electronics model) • Internal failure; contact supplier • Uncalibrated; return to supplier • Load fault; load current too high, load short circuit; check installation • Replace • Clean the fork with care • Wait 5 seconds
Incorrect switching	<ul style="list-style-type: none"> • Dry = On, Wet = On set correctly 	<ul style="list-style-type: none"> • Set the correct mode on electronics insert
Faulty switching	<ul style="list-style-type: none"> • Turbulence • Excessive electrical noise 	<ul style="list-style-type: none"> • Set a longer switching time delay • Suppress the cause of the interference

