

### Pump up / Pump Down App Note

Monitoring liquid level in a tank or container is a very common application in industry. Water, glue, oil and other liquids need to be stored and pumped to and from various areas of a plant, process and area. Although on the initial look these applications seem quite easy they do require a level of control beyond a simple ultrasonic sensor.

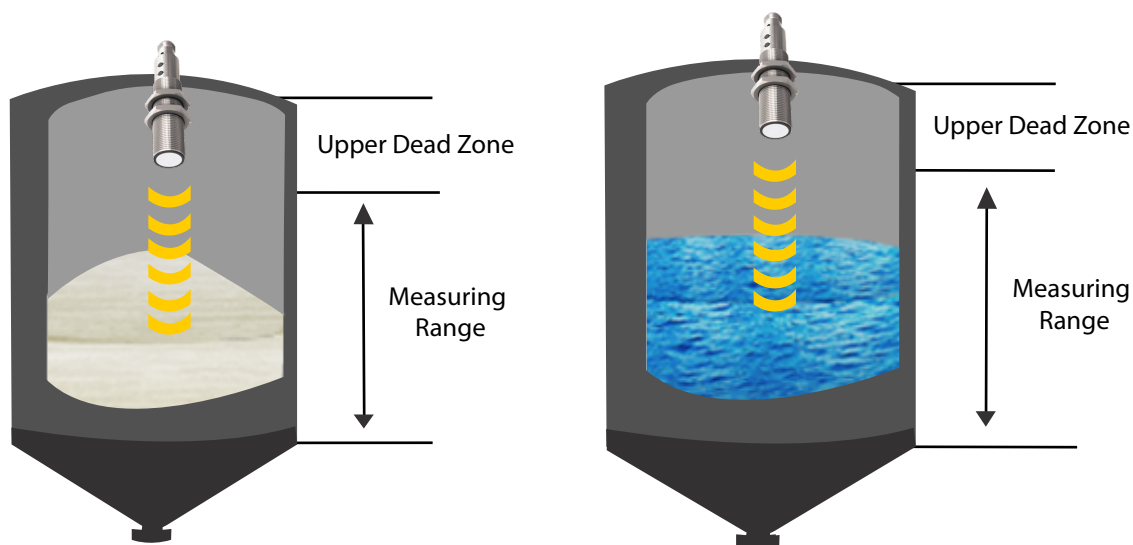
Our new programmable range of ultrasonic sensors can be set up to give optimal performance on applications requiring Pump up / Pump Down control.

“Pump up” refers to the filling cycle of a vessel or container.

“Pump down” is the removal of liquid from the vessel or container.

The control is completed with the addition of a monitoring channel to alarm if the pumping activity causes the level to go above a high limit (causing an overflow condition) or below a low limit (causing a run dry condition).

On the back of this brochure you will find the application notes to further explain how this is accomplished. Not suitable for use in pressurized vessels.



**Turck Ultrasonic type RU130U-M18E-2 UP8X2-H1151 (1610014) provides pump up function with alarm output, also called pump in function.**

**Select Teach Output 2:**

- Teach to GND for 8 seconds. Grey wire to Blue wire

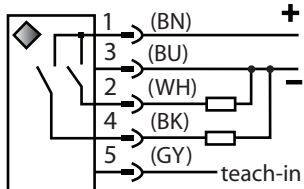
**Select Teach Output 2 Switch Point (SP2) Alarm Level 7":**

- Teach to GND for 2 seconds. Grey wire to Blue wire

**Select Teach Output 1:**

- Teach to GND for 2 seconds, Grey wire to Blue wire  
Measure and save Switch Point 1 (SP1 Near) 15"  
- Teach to GND for 8 seconds, Grey wire to Blue wire  
Measure and save Switch Point 2 (SP2 Far) 35"  
- Teach to GND for 2 seconds. Grey wire to Blue wire

**Wiring Diagram**



Use TURCK cordset type: RK4.5T-2(U2187)

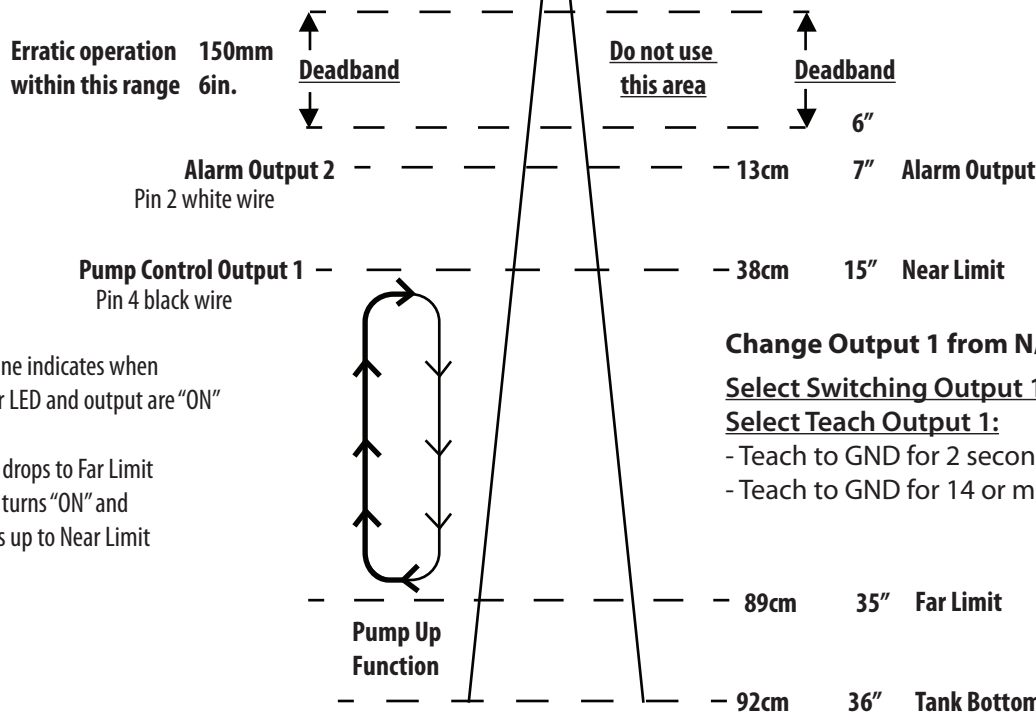
Amber LED is on when Output 1 is active and Green LED is on when output is inactive

**Change from Window to Hysteresis function**

**Select Switching Output 1:**

**Select Teach Output 1:**

- Teach to GND for 2 seconds, Grey wire to Blue wire  
Position a target at any point in the sensing range  
- Teach to GND for 8...13 seconds. Grey wire to Blue  
- Teach to GND again for 8...13 seconds. Grey to Blue



**Change Output 1 from N/O to N/C (Invert Function)**

**Select Switching Output 1:**

**Select Teach Output 1:**

- Teach to GND for 2 seconds, Grey wire to Blue wire  
- Teach to GND for 14 or more seconds Grey to Blue

**Restore factory settings:**

- Teach to GND for 14...19 seconds. Grey wire to Blue wire  
- Teach to GND for 2 or more seconds Grey wire to Blue wire

Bold line indicates when Amber LED and output are "ON"

Water drops to Far Limit  
Pump turns "ON" and pumps up to Near Limit