

# Switch-Pro™

w/ Compact Relay Controller



## AU13 & AZ13 Series Owner's Manual



Intended for side wall installation, the general purpose level switch package provides reliable liquid level detection with a 16A compact level controller for pump or valve control. The optional flash alarm brings attention to alarm conditions. Offered in two level sensor technologies, select the type and material based upon your application media. This liquid level switch package is widely applied in bulk storage and process tank level applications for high level control or low level control.

**FEATURES**

- Rugged Polypropylene, Ryton® or PFA sensor for corrosive liquids applications.
- Fail-Safe relay control of pumps, valves or alarms with a 0.15 to 60 second delay.
- Polypropylene enclosure rated NEMA 4X with swivel base for conduit alignment.
- Optional flashing alarm brings immediate attention to level alarm conditions.
- Invert switch changes relay state from NO to NC without rewiring.
- Offered in two sensing technologies for broad application coverage: ultrasonic and vibration.

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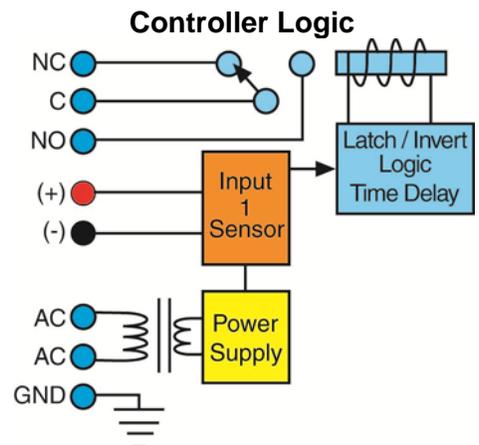
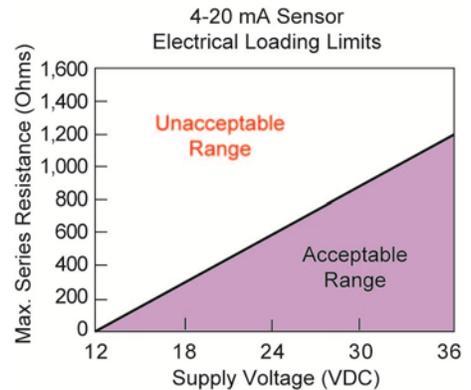
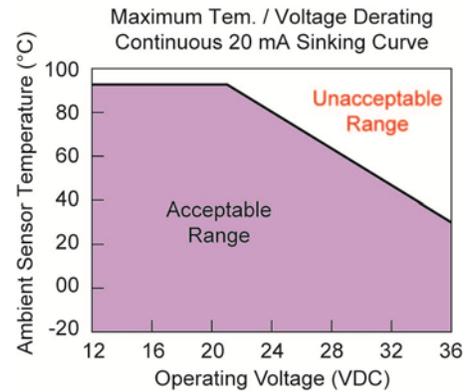
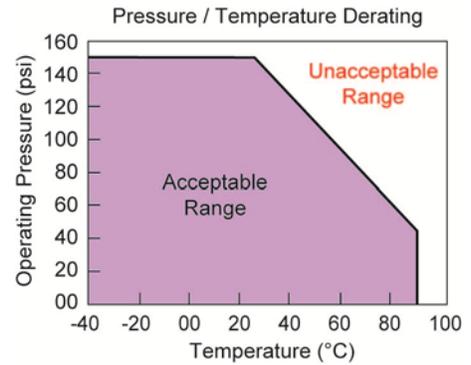
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Accuracy:	± 1mm in water
Repeatability:	± 0.5mm in water
LED indication:	Power, relay and sensor status
Supply voltage:	120/240 VAC @ 50-60 Hz.
Consumption:	0.25A maximum
Contact type:	(1) SPDT Relay
Contact rating:	250 VAC @ 16A, ½ Hp
Contact output:	Selectable NO or NC
Contact delay:	0.15 - 60 seconds
Process temp.:	F: -40°to 176° / C: -40°to 80°
Ambient temp.:	F: -40°to 140° / C: -40°to 60°
Pressure:	150 psi (10bar) @ 25 °C, derated @ 1.667 psi (0.113 bar) per °C above 25 °C.
Enclosure rating:	NEMA 4X (IP65)
Enclosure material:	-_11_: PP (U.L. 94 VO & PC) -_12_: PP (U.L. 94 VO)
Conduit entrance:	Single, 1/2" NPT
Wetted material:	AZ13-11__: Ryton® AU13-11__: PP AU13-11__: PFA
Enclosure mount.:	3/4" NPT (G)
Enclosure rotation:	300°swivel base
Mount. Gasket:	Viton® (G version only)
Classification:	General purpose
Certificate number:	LR 79326-3
CE compliance:	EN 61326 EMC EN 61010-1 Safety

### STROBE ALERT

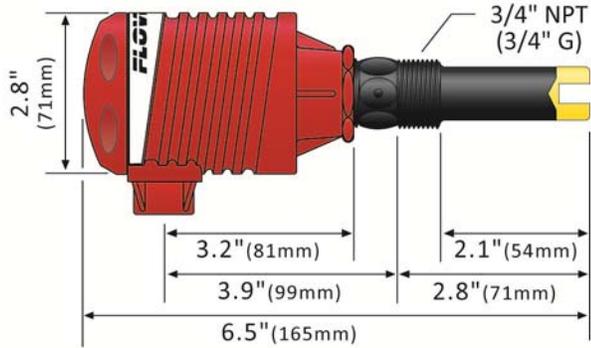
Flash type:	Xenon tube
Flash frequency:	1 per second
Strobe life:	10M cycles
Supply voltage:	120 VAC, 50-60 Hz.
Consumption:	3 Watts max.
Material:	Polycarbonate
Enclosure rating:	NEMA 4X (IP65)
Color:	Amber



**DIMENSIONS**

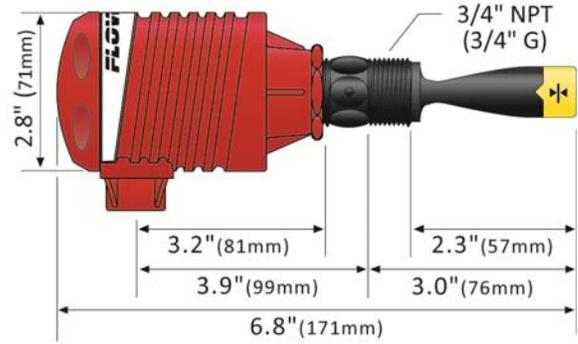
**Ultrasonic w/o Strobe**

**AU13-112\_ & AU13-212\_ Series**



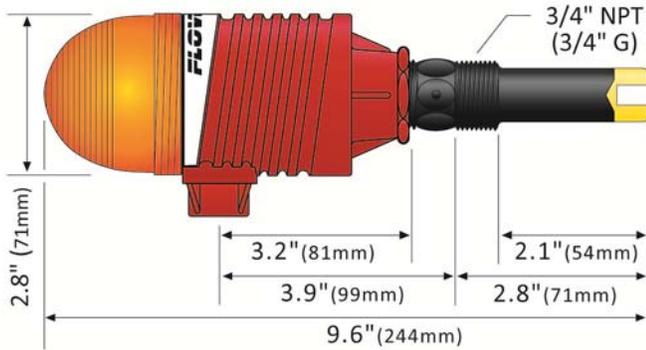
**Vibration w/o Strobe**

**AZ13-112\_ Series**



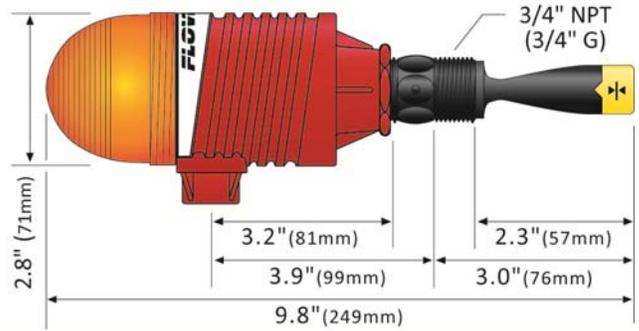
**Ultrasonic w/ Strobe Alert™**

**AU13-111\_ & AU13-211\_ Series**



**Vibration w/ Strobe Alert™**

**AZ13-111\_ Series**



**ABOUT SWITCH-PRO™**

Flowline’s Switch-Pro™ with Compact Relay Controller is a single-point mounting system for installing through the side-wall of a tank. The compact relay controller features a 120/240 VAC controller with a 250 VAC, 16A, 1/2Hp SPDT relay contract.

Part Number	240 VAC Option	CE Option	Thread	Strobe Alert	Sensor Material	Sensor Technology	
AU13-1110	Add (-E)	N/A	NPT	Yes	PP	Ultrasonic	
AU13-1114			G				
AU13-1120		Add (-CE)	NPT	No			
AU13-1124			G				
AU13-2110		N/A	NPT	Yes	PVDF		
AU13-2114			G				
AU13-2120		Add (-CE)	NPT	No			
AU13-2124			G				
AZ13-1110		Add (-E)	N/A	NPT	Yes	Ryton®	Vibration
AZ13-1114				G			
AZ13-1120			Add (-CE)	NPT	No		
AZ13-1124				G			

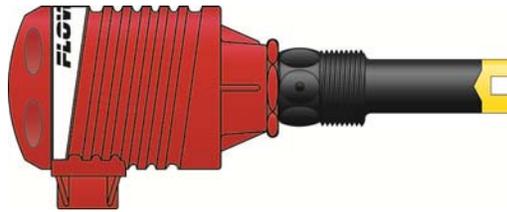
- Owner’s Manual

**RELAY CONTROLLER**

The level switch is pre-wired before shipment to the 2-pole terminal strip [(+) & (-)]. The technologies used to indicate level is either Ultrasonic or Vibration. Both the sensing technologies feature similar wiring/power configuration. The Compact Relay Controller provides a 1/2” Conduit connection and 6 poles for wire termination of power and relay contact. Use the AC, AC and GND terminals for providing power. Use the NC, NC and COM terminals for interfacing to the relay contact.

STANDARD CONFIGURATION

AU13-\_\_1\_\_ or AZ12-11\_\_



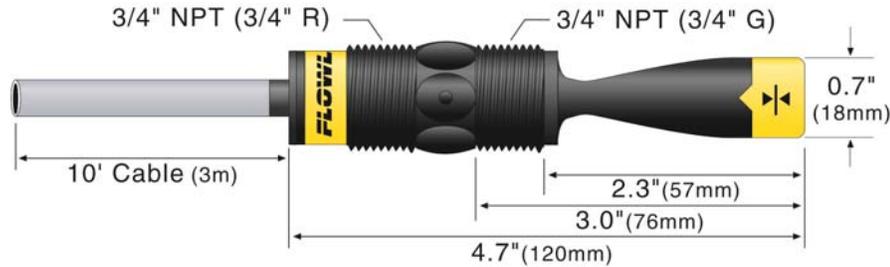
AU13-1120 Shown

		Ultrasonic		Vibration
		PP	PFA	Ryton®
Strobe Alert	3/4" NPT	<u><b>AU13-1110</b></u> 1 x LU10-1405 1 x LC10-1002	<u><b>AU13-2110</b></u> 1 x LU10-2405 1 x LC10-1002	<u><b>AZ13-1110</b></u> 1 x LZ12-1405 1 x LC10-1002
	3/4" G	<u><b>AU13-1114</b></u> 1 x LU10-1425 1 x LC10-1052	<u><b>AU13-2114</b></u> 1 x LU10-2425 1 x LC10-1052	<u><b>AZ13-1114</b></u> 1 x LZ12-1425 1 x LC10-1052
No Strobe	3/4" NPT	<u><b>AU13-1120</b></u> 1 x LU10-1405 1 x LC10-1001	<u><b>AU13-2120</b></u> 1 x LU10-2405 1 x LC10-1001	<u><b>AZ13-1120</b></u> 1 x LZ12-1405 1 x LC10-1001
	3/4" G	<u><b>AU13-1124</b></u> 1 x LU10-1425 1 x LC10-1051	<u><b>AU13-2124</b></u> 1 x LU10-2425 1 x LC10-1051	<u><b>AZ13-1124</b></u> 1 x LZ12-1425 1 x LC10-1051

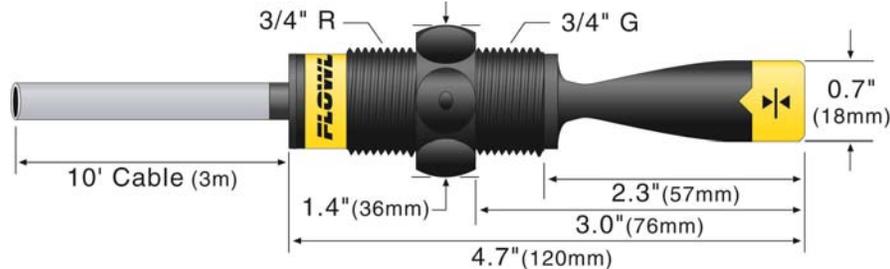
**VIBRATION SWITCH (AZ13-11\_\_ SERIES)**

The vibration switch (tuning fork) operates at a nominal frequency of 400 Hz. As the switch becomes immersed in a liquid or slurry, a corresponding frequency shift occurs. When the measured frequency shift reaches the set point value, the switch changes state indicating the presence of a liquid or slurry medium. For optimum performance and proactive maintenance, the sensor automatically adjusts for coating, and if necessary, outputs a preventative maintenance alarm.

**Vibration Switch NPT Version**



**Vibration Switch G Version**



**⚠ Do not squeeze the forks together. Doing so could damage or break the sensor and void the warranty.**

When powering up the AZ13-11\_\_ series, the start-up procedure requires the switch to cycle through a wet condition for 1/2 second in order to determine an initial resonance. The relay within the controller will switch between open and close during this sequence.

**LZ12 SPECIFICATIONS**

Sensor material:	Ryton® (glass fill) Viton® cable grommet	Cable jacket mat'l:	PP
		Cable type:	5-conductor, #24 AWG (shielded)

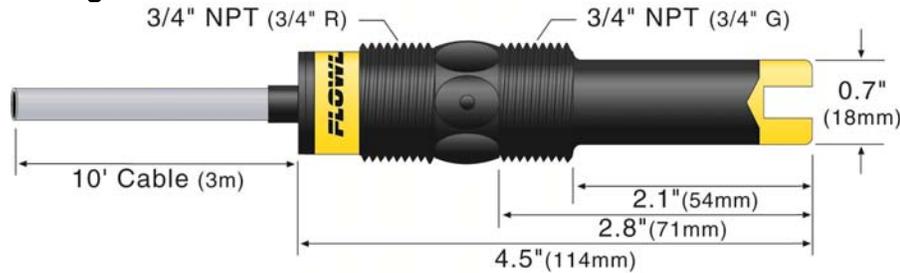
**CONFIGURATIONS**

Part Number	Material (body)	Material (cable)	Thread (inside x outside)
LZ12-1405	Ryton	Polypropylene	3/4" NPT x 3/4" NPT
LZ12-1425	Ryton	Polypropylene	3/4" R x 3/4" G

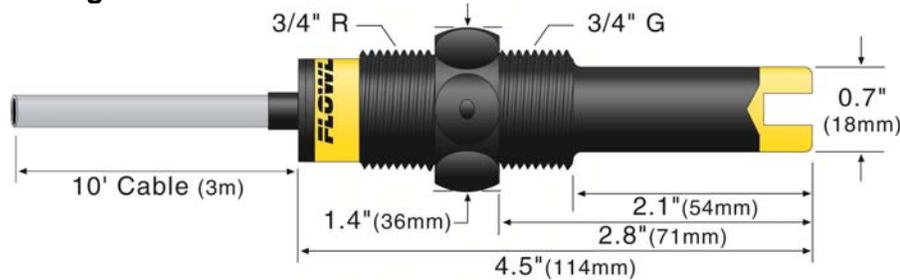
**ULTRASONIC SWITCH (AU13-11\_\_ & AU13-21\_\_ SERIES)**

The Ultrasonic level switch generates a 1.5 MHz ultrasonic wave from a miniature piezoelectric transducer located on one side of the gap within its sensing tip. Another piezo transducer, located on the other side of the gap, acts as a microphone, picking up the sound wave. When liquid enters the gap, there is a change in the speed the wave crosses the gap. This change in the speed of sound identifies whether the sensor is in liquid or in air.

**Tuning Fork NPT Version**



**Tuning Fork G Version**



**⚠ The sensor should be installed so that the liquid will drip out of the gap when the sensor becomes dry.**

**LU10 SPECIFICATIONS**

Sensor material:	1__5: PP	Cable jacket mat'l:	1__5: PP
	2__5: PFA		2__5: PFA

**CONFIGURATIONS**

Part Number	Length	Material (body)	Material (cable)	Thread	
				cable side	X sensor side
LU10-1405	Long (4.5")	Polypropylene	Polypropylene	(3/4" NPT)	x (3/4" NPT)
LU10-1425	Long (4.5")	Polypropylene	Polypropylene	(3/4" R)	x (3/4"G)
LU10-2405	Long (4.5")	PFA	PFA	(3/4" NPT)	x (3/4" NPT)
LU10-2425	Long (4.5")	PFA	PFA	(3/4" R)	x (3/4"G)

- ⚠ **About This Manual:** PLEASE READ THE ENTIRE MANUAL PRIOR TO INSTALLING OR USING THIS PRODUCT. This manual includes information on the Switch-Pro™ with Compact Level Controller from Flowline: AU13-11\_\_, AU13-21\_\_ & AZ13-11\_\_. The units are identical except for the material of construction and sensing technology of the sensor.
- ⚠ **User's Responsibility for Safety:** Flowline manufactures a wide range of liquid sensors, controllers, and mounting systems. It is the user's responsibility to select components that are appropriate for the application, install them properly, perform tests of the installed system, and maintain all components. The failure to do so could result in property damage or serious injury.
- ⚠ **Proper Installation and Handling:** Use a proper sealant with all installations. Never over-tighten the components. Always check for leaks prior to system start-up.
- ⚠ **Material Compatibility:**
  - **Polypropylene** (PP, a polyolefin): Sensor (AU13-11\_\_ series only), Junction Box.
  - **Ryton:** Sensor (AZ13-11\_\_ series only).
  - **Polyvinylidene Fluoride** (PVDF): Sensor (AU13-21\_\_ series only).
  - Make sure that the application liquids are compatible with the materials that will be wetted. To determine the chemical compatibility between the components and its application liquids, refer to the Compass Corrosion Guide, available from Compass Publications (phone 858-589-9636).
- ⚠ **Electrical Shock Hazard:** It is possible to contact components on the controller that carry high voltage, causing serious injury or death. All power to the controller and the relay circuit(s) it controls should be turned OFF prior to working on the controller. If it is necessary to make adjustments during powered operation, use extreme caution and use only insulated tools. Making adjustments to powered controllers is not recommended. Wiring should be performed by qualified personnel in accordance with all applicable national, state and local electrical codes.
- ⚠ **Flammable or Explosive Applications:** DO NOT USE THE AU13-11\_ \_\_, AU13-21\_ \_\_ or AZ13-11\_ \_\_ Switch-Pro™ GENERAL PURPOSE SENSOR WITHIN CLASSIFIED HAZARDOUS ENVIRONMENTS.

⚠ **Warning** ⚠

- ⚠ *The rating for the relay is 250 VAC, 16A, ½ Hp.*
- ⚠ *Flowline's Switch-Pro™ level switches are not recommendable for use with electrically charged application liquids. For most reliable operation, the liquid being measured may need to be electrically grounded.*
- ⚠ *The sensing tip of the sensor must always be submersed in the liquid and never exposed to air.*
- ⚠ *The liquid temperature must remain constant and not change throughout the process*

**⚠ Make a Fail-Safe System:** Design a fail-safe system that accommodates the possibility of relay or power failure. If power is cut off to the controller, it will de-energize the relay. Make sure that the de-energized state of the relay is the safe state in your process. For example, if controller power is lost, a pump used to fill a tank will turn off if it is connected to the Normally Open side of the relay.

While the internal relay is reliable, over the course of time relay failure is possible in two modes: under a heavy load the contacts may be “welded” or stuck into the energized position, or corrosion may buildup on a contact so that it will not complete the circuit when it should. In critical applications, redundant backup systems and alarms must be used in addition to the primary system. Such backup systems should use different sensor technologies where possible.

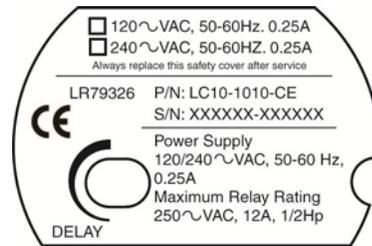
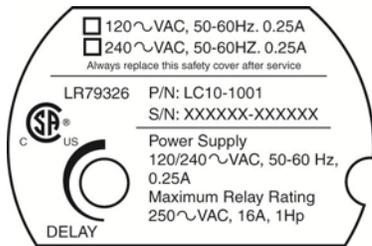
While this manual offers some examples and suggestions to help explain the operation of FLOWLINE products, such examples are for information only and are not intended as a complete guide to installing any specific system.

**⚠ Relay Contact Rating:** The relay is rated for a 16 amp resistive load. Many loads (such as a motor during start-up or incandescent lights) are reactive and may have an inrush current characteristic that may be 10 to 20 times their steady-state load rating. The use of a contact protection circuit may be necessary for your installation if the 16 amp rating does not provide an ample margin for such inrush currents.

**⚠ Safety Cover:** Based upon the part number selected, a safety cover has been placed within the enclosure. Always replace the safety cover after any service.

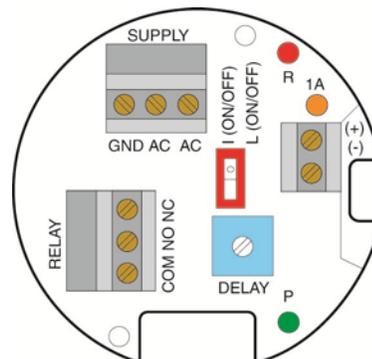
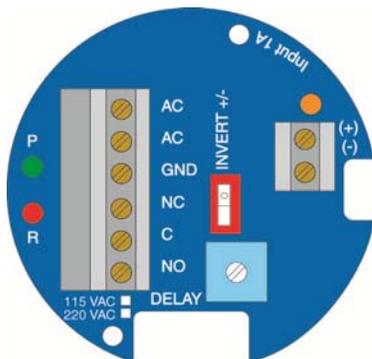
**Standard Version (Non-CE)**

**CE Version (ex: AG12-1620-CE or AT14-3620-CE)**



**Open View of Controller (Non-CE)**

**CE Version (ex: AU13-2120-CE or AZ13-1120-CE)**

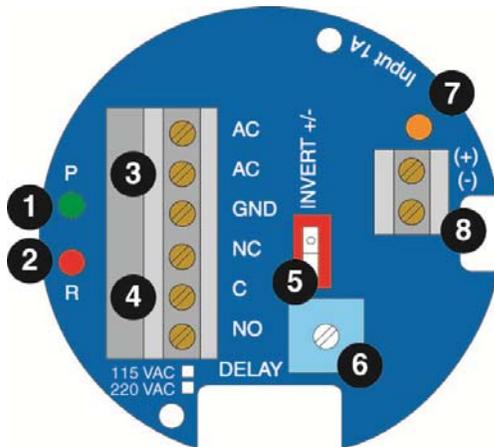


The relay inside the controller is a single pole, double throw type; the controlled device can be connected to either the normally open or normally closed side of the relay. A time delay from 0.15 to 60 seconds can be set before the relay responds to the sensor input.

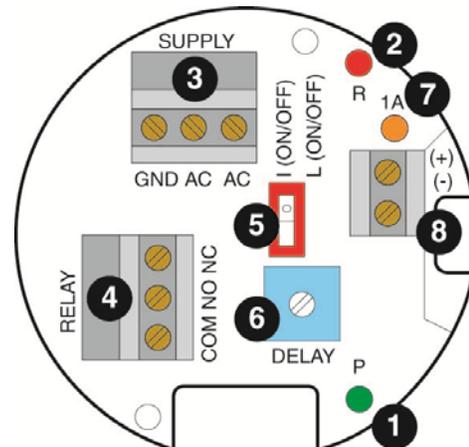
**GUIDE TO CONTROLS**

Below is a listing and the location of the different components for the controller:

**Standard Version (Non-CE)**



**CE Version**



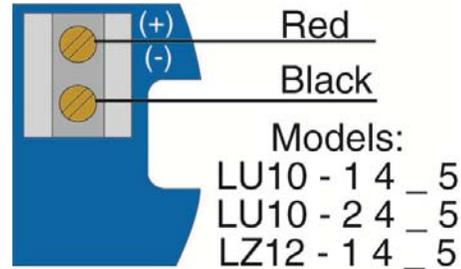
1. **Power indicator:** This green LED lights when AC power is ON.
2. **Relay indicator:** This red LED will light whenever the controller energizes the relay, in response to the proper condition at the sensor input and after the time delay.
3. **AC Power terminals:** Connection of 120 VAC power to the controller. The setting may be changed to 240 VAC if desired. This requires changing internal jumpers; this is covered in the Installation section of the manual. Polarity (neutral and hot) does not matter.
4. **Relay terminals (NC, C, NO):** Connect the device you wish to control (pump, alarm etc.) to these terminals: supply to the COM terminal, and the device to the NO or NC terminal as required. The switched device should be a non inductive load of not more than 16 amps; for reactive loads the current must be derated or protection circuits used. When the red LED is ON and the relay is in the energized state, the NO terminal will be closed and the NC terminal will be open.
5. **Invert switch:** This DIP switch reverses the logic of the relay control in response to the sensor(s): conditions that used to energize the relay will make it turn off and vice versa.
6. **Time Delay:** After the input(s) change(s) state, this control sets a delay from 0.15 to 60 seconds before the relay will respond.
7. **Input 1A indicator:** These amber LED will light immediately whenever the sensor attached to the controller detects liquid and will turn off when it no longer detects liquid.
8. **Input terminals:** Connect the wiring from the sensors to these terminals: Note the polarity: (+) is a 13.5 VDC, 25 mA power supply (to be connected to the red wire of a Flowline sensor), and (-) is the return path from the sensor (to be connected to the black wire of a Flowline sensor).

Follow these steps for the electrical portion of this manual:

1. Confirm level switch is attached to the input terminals.
2. Provide 120/240 VAC power to the sensor.
3. Connect switched device to the relay terminals.
4. Attach strobe (if included) to the relay terminals.

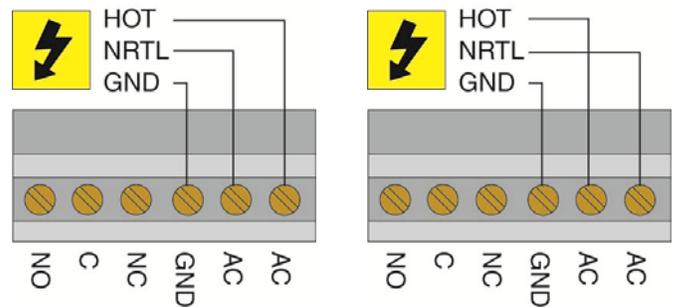
**1. Confirm level switch is attached (Connecting switches to input terminals):**

The sensor provided is prewired. The level switch will be wired with the Red wire to the (+) terminal and the Black wire to the (-) terminal. Amber LED is ON when the sensor detects liquid and OFF when no liquid is detected.



**2. Provide 120/240 VAC power (VAC Power Input Wiring):**

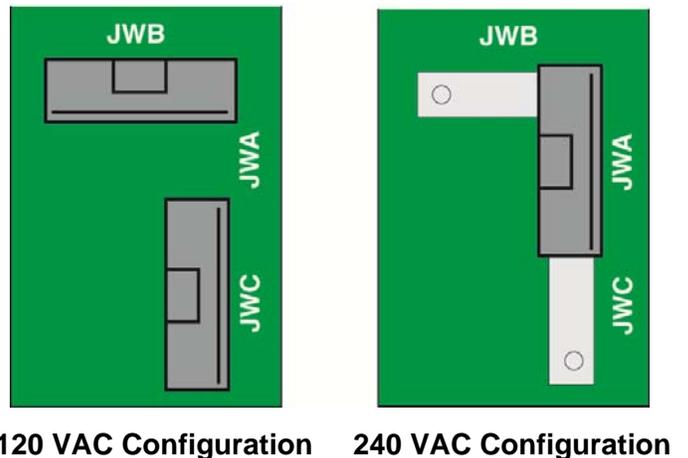
Observe the labeling on the controller on whether it is configured as 120 or 240 VAC. **Note:** Polarity does not matter with the AC input terminal.



**CHANGING FROM 120 TO 240 VAC**

1. Remove the two screws from the top of the printed circuit board (PCB) and gently slide the PCB from the housing. Use caution when removing the PCB.
2. Located jumpers JWA, JWB and JWC on the PCB.
3. To change to 240 VAC, remove jumpers from JWB and JWC and place a single jumper across JWA. To change to 120 VAC, remove jumper JWA and place jumpers across JWB and JWC.
4. Gently return PCB into housing and replace the two screws.

**Standard Version (Non-CE)**



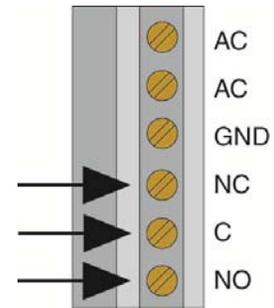
**CE Version**



**3. Connect switched device to the relay (Relay Input Wiring):**

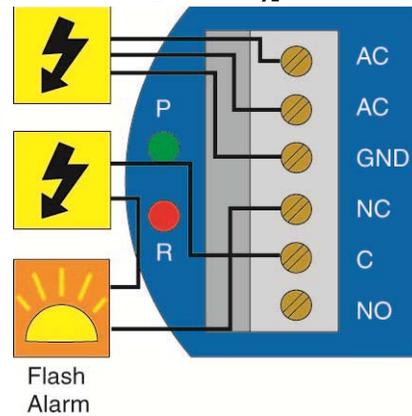
The relay is a dry contact single pole, double throw type rated at 250 VAC, 16A, ½ Hp. The two terminals NO and NC (normally open and normally closed) will be used in different applications with C (common) used regardless of choice between NO or NC.

**Note:** the "normal" state is when the relay coil is de-energized (the Red relay LED will be OFF). Regardless of the invert status (ON or OFF), the normal state will always be when the Red LED is OFF.



**4. Attach strobe [Strobe Alert Output (AU13-111\_, AU13-211\_ & AZ13-111\_ Series)]:**

With the Strobe Alert wired NC; it can be used as a high or low level alarm, depending on the setting for the invert switch. The Strobe Alert can also be wired NO. **Note:** the Strobe Alert™ shares the relay within the sensor. The flashing alarm can be set to either indicate when the switched device (pump, valve or alarm) is active or not active.

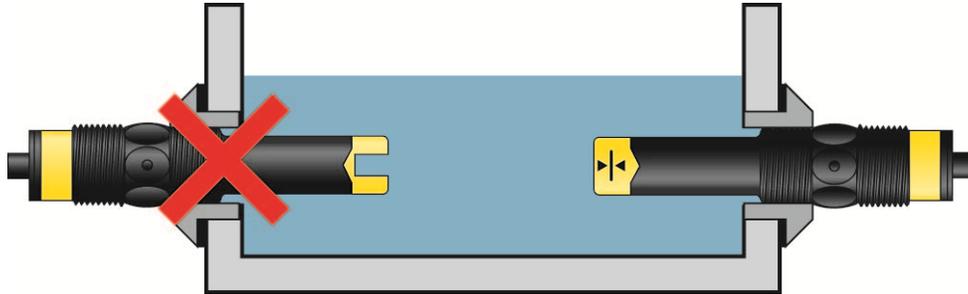


### THROUGH WALL INSTALLATION

Flowline's Switch-Pro™ A\_13 series may be installed through the side wall of a tank. The sensor has male 3/4" NPT (3/4" G) threads on one side of a 15/16" wrench flat. This enables the user to select the sensor's mounting orientation, installed outside of the tank in.

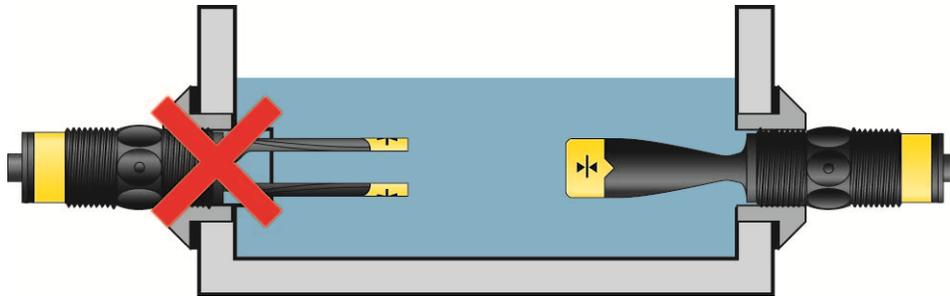
### ULTRASONIC ORIENTATION

Install the switch such that the gap is aligned up and down, allowing for liquid to easily leave the gap. Avoid aligning the gap horizontally. This could allow material to collect on one of the flat surfaces in the gap. See the illustrations below for further information.



### VIBRATION ORIENTATION

Install the switch such that the forks are aligned up and down, allowing for liquid to easily leave the space between the forks. Avoid aligning the gap horizontally. This could allow material to collect on one of the forks. See the illustrations below for further information.



#### ⚠ Warning

- ⚠ Do not squeeze the forks together. Doing so could damage or break the sensor and void the warranty.
- ⚠ Always install the Viton gasket with all versions of the AU13-1\_4 or AZ13-1\_4. The G threaded version will not seal unless the gasket is properly installed.

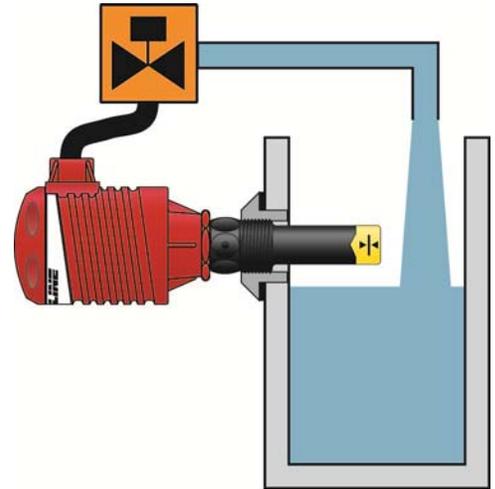
### INSTALL IN A DRY LOCATION

The controller housing is liquid-resistant and made of Polypropylene (PP). When installed properly, the controller is not designed to be immersed. It should be mounted in such a way that it does not normally come into contact with fluid. Refer to an industry reference to ensure that compounds that may splash onto the controller housing will not damage it. Such damage is not covered by the warranty.

### HIGH ALARM

The goal is to indicate when a high level of liquid is reached. This alarm point would be used to indicate when the tank is full or to prevent a tank from overflowing. Switch-Pro™ will typically interface with alarms, pumps or valves:

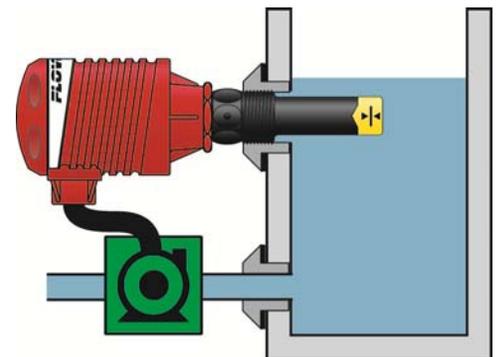
- Tank is full:
  - Primarily uses an alarm (visual, audible or both).
  - Alarm will trigger (activate alarm device) when the sensor becomes wet.
  - Location of sensor determines the level of the alarm.
- Prevent a tank from overflowing:
  - Switch-Pro™ can be used as a redundant override that will break power to the pump or valve, thus preventing the tank from overflowing.
  - Location of the sensor determines the level for the override.
    - Choose a location below where the liquid will actually overflow from the tank.
  - When liquid level lowers, Switch-Pro™ will become dry and the pump circuit will close enabling the tank fill to begin again.
    - Do not use Switch-Pro™ as the stop for an automatic fill process unless a latching circuit has been added to control the start function.



### LOW ALARM

The goal is to indicate when a low level of liquid is reached. This alarm point would be used to indicate when the tank is empty, when it is time to re-order product or to protect a pump from operating while dry.

- Tank is empty:
  - Primarily uses an alarm (visual, audible or both).
  - Alarm will trigger (activate alarm device) when the sensor becomes dry.
  - Location of sensor determines the level of the alarm.
- Re-order product:
  - Primarily uses an alarm (visual, audible or both).
  - Alarm will trigger (activate alarm device) when the sensor becomes dry.
  - Location of sensor determines the level of the alarm.
- Protect a pump:
  - Switch-Pro™ can be used as a redundant override that will break power to the pump, thus preventing the pump from operating dry.
  - Location of the sensor determines the level for the override.
    - Position the sensor above the location for the pump inlet.
    - As long as the switch is wet, then there is liquid for the pump to operate.
  - When liquid level rises, Switch-Pro™ will become wet and the pump circuit will close enabling the pump to operate again.



**CONTROLLER LOGIC**

Please use the following guide to understand the operation of the controllers.

1. **Power LED:** Make sure the Green power LED is ON when power is supplied to the controller.
2. **Input LED:** Indicates the status of the level switch. The input LED on the controller will be Amber when the switch is in contact with liquid (wet) and OFF when the switch is no longer in contact with liquid (dry).
3. **Invert Operation:** When the input LED turns Off and On, the relay LED will also switch. With invert Off, the relay LED will be On when the input LED is On and Off when the input LED is Off. With invert On, the relay LED will be Off when the input LED is On and On when the input LED is Off.
4. **Relay Operation:** The relay may be wired either NO or NC. The normal state of the relay is when its LED is Off. With the LED On, the relay is in the energized mode and all terminal connections are reversed.

**TROUBLESHOOTING**

PROBLEM	SOLUTION
Controller is powered, but nothing happens.	First check the Power LED to make sure it is Green. If not, check the wiring, power and make sure the terminal is seated correctly over the 6-pins.
A wet or dry condition is met but the relay did not switch.	Check the relay by switching the invert switch. Confirm that relay click on and off as well as the relay LED.
A wet or dry condition is met, but the relay physically switches too late.	Check the delay setting on the controller. The delay can be set from 0.15 to 60 seconds. Turning the delay slightly counter-clockwise will reduce the reaction time. The delay affects both the make and break side of the contact.
When a wet or dry condition is met, the relay chatters on and off.	The liquid level has some waves which is causing the sensor to switch between wet and dry conditions. Adding a little time delay will correct this. A slight turn clockwise to the delay is all that is needed.

**GENERAL**

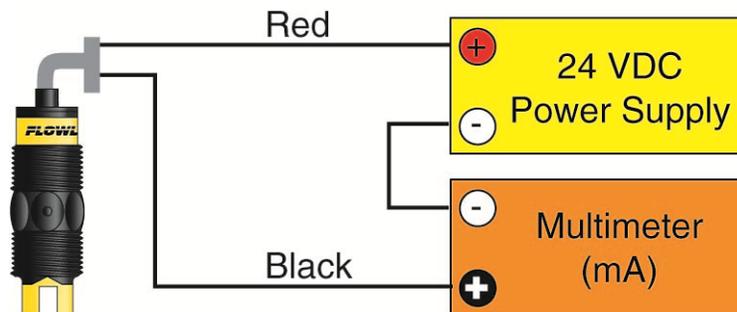
The Switch-Pro™ level switch requires no periodic maintenance except to clean off any deposits or scaling from the sensor tip as necessary. It is the responsibility of the user to determine the appropriate maintenance schedule, based on the specific characteristics of the application liquids.

**CLEANING PROCEDURE**

- 1. Power:** Make sure that all power to the sensor, controller and/or power supply is completely disconnected.
- 2. Sensor Removal:** *Make sure that the liquid level is below the location of the sensor and the tank is not pressurized.* Carefully, remove the sensor from the installation. Replace the sensor with a 3/4" NPT plug to insure that liquid does not leak out during this procedure. **Do not re-install the Switch-Pro™ if the threads are damaged.**
- 3. Cleaning the Sensor:** Use a soft bristle brush and mild detergent, carefully wash the Switch-Pro™ level switch. Do not use harsh abrasives such as steel wool or sandpaper, which might damage the surface sensor. Do not use incompatible solvents which may damage the sensor's PP, Ryton or PVDF plastic body.
- 4. Sensor Installation:** Follow the appropriate steps of installation as outlined in the installation section of this manual.

**CURRENT TEST (SENSOR ONLY)**

Use to verify if the sensor indicates a wet or dry condition. A power supply (typically 12 to 28 VDC) and a multimeter [set to read current (mA)] are required. This test uses only two wires (Red and Black). The White and Green wires are not used.



### WARRANTY

Flowline warrants to the original purchaser of its products that such products will be free from defects in material and workmanship under normal use and service in accordance with instructions furnished by Flowline for a period of two years from the date of manufacture of such products. Flowline's obligation under this warranty is solely and exclusively limited to the repair or replacement, at Flowline's option, of the products or components, which Flowline's examination determines to its satisfaction to be defective in material or workmanship within the warranty period. Flowline must be notified pursuant to the instructions below of any claim under this warranty within thirty (30) days of any claimed lack of conformity of the product. Any product repaired under this warranty will be warranted only for the remainder of the original warranty period. Any product provided as a replacement under this warranty will be warranted for the full two years from the date of manufacture.

### RETURNS

Products cannot be returned to Flowline without Flowline's prior authorization. To return a product that is thought to be defective, go to [www.flowline.com](http://www.flowline.com), and submit a customer return (MRA) request form and follow the instructions therein. All warranty and non-warranty product returns to Flowline must be shipped prepaid and insured. Flowline will not be responsible for any products lost or damaged in shipment.

### LIMITATIONS

This warranty does not apply to products which: 1) are beyond the warranty period or are products for which the original purchaser does not follow the warranty procedures outlined above; 2) have been subjected to electrical, mechanical or chemical damage due to improper, accidental or negligent use; 3) have been modified or altered; 4) anyone other than service personnel authorized by Flowline have attempted to repair; 5) have been involved in accidents or natural disasters; or 6) are damaged during return shipment to Flowline. Flowline reserves the right to unilaterally waive this warranty and dispose of any product returned to Flowline where: 1) there is evidence of a potentially hazardous material present with the product; or 2) the product has remained unclaimed at Flowline for more than 30 days after Flowline has dutifully requested disposition. This warranty contains the sole express warranty made by Flowline in connection with its products. **ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED.** The remedies of repair or replacement as stated above are the exclusive remedies for the breach of this warranty. **IN NO EVENT SHALL FLOWLINE BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND INCLUDING PERSONAL OR REAL PROPERTY OR FOR INJURY TO ANY PERSON. THIS WARRANTY CONSTITUTES THE FINAL, COMPLETE AND EXCLUSIVE STATEMENT OF WARRANTY TERMS AND NO PERSON IS AUTHORIZED TO MAKE ANY OTHER WARRANTIES OR REPRESENTATIONS ON BEHALF OF FLOWLINE.** This warranty will be interpreted pursuant to the laws of the State of California. If any portion of this warranty is held to be invalid or unenforceable for any reason, such finding will not invalidate any other provision of this warranty.

For complete product documentation, video training, and technical support, go to [www.flowline.com](http://www.flowline.com).

For phone support, call 562-598-3015 from 8am to 5pm PST, Mon - Fri.

(Please make sure you have the Part and Serial number available.)