

# Thermo-Flo™

**With Compact Junction Box**  
**AT17, AT18, AG17 & AG18 Series Manual**



**Flowline Inc.**  
**10500 Humbolt Street**  
**Los Alamitos, CA 90720**  
**Tel: (562) 598-3015**  
**Fax: (562) 431-8507**  
[www.flowline.com](http://www.flowline.com)

Offered in liquid and gas sensor types, the general purpose flow switch package provides reliable no or low-flow detection of relatively clean non-coating media with a 1A relay output and a compact junction box for wiring termination. Liquid examples include water and acetic acid. Available in Polypropylene-Ryton® or Polyvinylidene Fluoride (PVDF), the short flow sensor is used in pipe or ducting from ½” to 1½”, and the long configuration is used in 2” and up. The flow switch set point may be adjusted from 0.04 fps to 3 fps in liquids, or 1 to 90 fps in gases as a low-flow alarm. The flow sensor is best applied in applications with relatively constant temperature.

**Features**

- Rugged Polypropylene-Ryton® or Polyvinylidene Fluoride sensor for corrosive liquids and gases.
- Adjustable set point with LED for flow or no-flow status indication.
- Polypropylene enclosure rated NEMA 4X with swivel base for conduit alignment.
- 60 VA, 1A relay selectable NO to NC via power supply wiring polarity.
- Solid state sensor is not damaged by over-ranging flow velocities.

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Set point range: AT1\_: .04 to 3 fps (.012 to .91 mps)  
 AG1\_: 1 to 90 fps (.3 to 27 mps)

Factory set point: AT1\_: .2 fps (.06 mps)  
 AG1\_: 10 fps (3 mps)

Repeatability: ± 0.5% of set point @ fixed temp.

Response time: 1 to 10 seconds

Set point adjust.: Potentiometer

LED indication: Flow status

Viscosity range: AT1\_: 1 to 200 centipoise  
 AG1\_: N/A

Supply voltage: 14 to 36 VDC

Consumption: 70 mA maximum

Contact type: (1) SPST Relay

Contact rating: 60 VA @ 1A maximum

Contact output: Selectable NO or NC

Process temp.: F: 32° to 140° / C: 0° to 60°

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: PP (U.L. 94 VO)

Termination: 6-poles

Conduit entrance: Single, 1/2" NPT

Wetted material: -163\_: PP-Ryton®  
 -363\_: PVDF

Process mount.: 3/4" NPT (Rp or G)

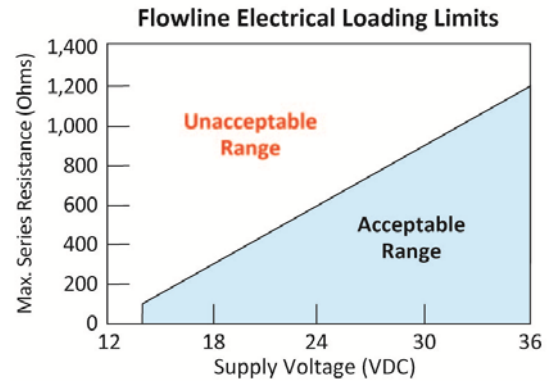
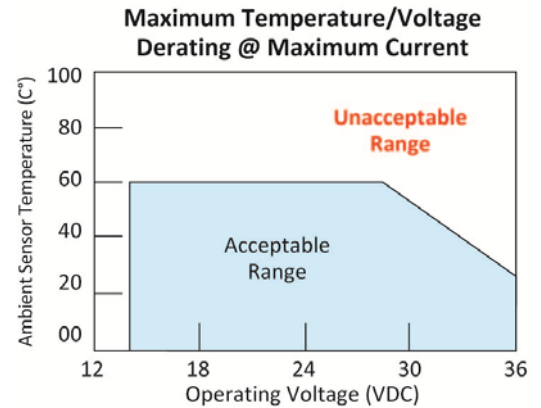
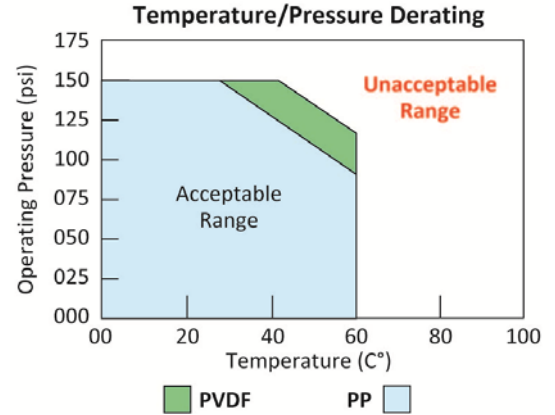
Mount. Gasket: Viton® (Rp or G version only)

Enclosure rotation: 300° swivel base

Classification: General purpose

CE compliance: EN 61326 EMC  
 EN 61010-1 Safety

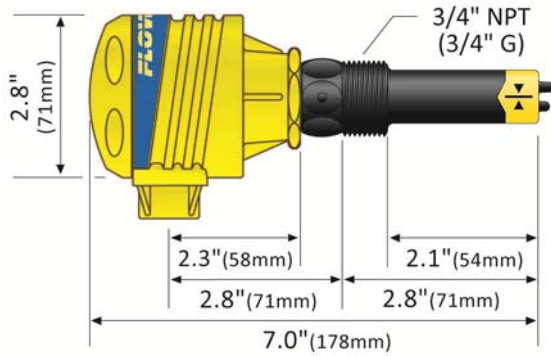
**⚠ Make a Fail-Safe System:** Design a fail-safe system that accommodates the possibility of switch and/or power failure. FLOWLINE recommends the use of redundant backup systems and alarms in addition to the primary system. Adding a redundant alarm switch to the system is a cost effective means to prevent costly run-dry issues.



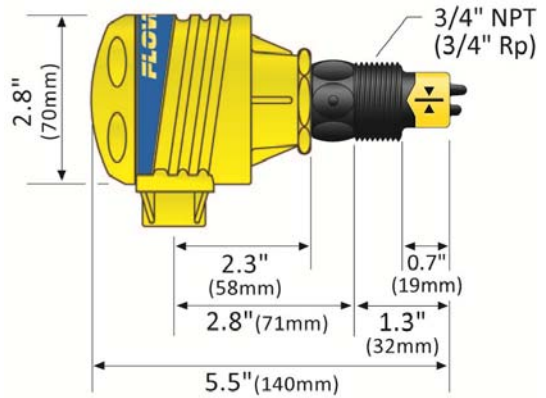
**Internal View of Junction Box**



**Dimensions  
Long Sensor**



**Short Sensor**



**About Thermo-Flo™:** Flowline’s Thermo-Flo™ with Compact Junction Box is a single-point mounting system for installing one flow sensor within a pipe or fume. The sensor and junction box features a single SPST 60VA, 1A maximum relay contact.

Part Number	Thread	Sensor Material	Sensor Length	Application Media
AG17-1630	NPT	PP-Ryton®	Short	Gas
AG17-1634	Rp			
AG17-3630	NPT	PVDF	Short	
AG17-3634	Rp			
AG18-1630	NPT	PP-Ryton®	Long	
AG18-1634	G			
AG18-3630	NPT	PVDF	Long	
AG18-3634	G			
AG17-1630	NPT	PP-Ryton®	Short	Liquid
AG17-1634	Rp			
AG17-3630	NPT	PVDF	Short	
AG17-3634	Rp			
AG18-1630	NPT	PP-Ryton®	Long	
AG18-1634	G			
AG18-3630	NPT	PVDF	Long	
AG18-3634	G			

- Owner’s Manual

- ⚠ About This Manual:** PLEASE READ THE ENTIRE MANUAL PRIOR TO INSTALLING OR USING THIS PRODUCT. This manual includes information on the Thermo-Flo™ with Compact Junction Box (Flow) from Flowline: AG17-\_63\_\_, AG18-\_63\_\_, AT17-\_63\_\_ & AT18-\_63\_. The units are identical except for the material of construction and size 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:** Because this is an eclectically operated device, only properly trained staff should install and/or repair this product. Use a proper sealant with all installations. **Note:** *Always install the 3/4" Viton gasket with all versions of Thermo-Flo™ with metric threads. The G threaded version will not seal unless the gasket is properly installed.* Never over tighten the sensor within the fitting, beyond a maximum of 80 inch-pounds torque. Always check for leaks prior to system start-up.
- ⚠ Material Compatibility:**
- **Polypropylene** (PP, a polyolefin): Sensor (AT1\_-163\_ and AG1\_-163\_ only) and Junction Box.
  - **Ryton:** Sensor (AT1\_-163\_ and AG1\_-163\_ only).
  - **Polyvinylidene Fluoride** (PVDF): Sensor (AT1\_-363\_ and AG1\_-363\_ 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).
- ⚠ Wiring and Electrical:** The supply voltage used to power the sensor should never exceed a maximum of 36 volts DC. Electrical wiring of the sensor should be performed in accordance with all applicable national, state, and local codes.
- ⚠ Flammable or Explosive Applications:** DO NOT USE THE AG17-\_63\_\_, AG18-\_63\_\_, AT17-\_63\_ OR AT18-\_63\_ Thermo-Flo™ GENERAL PURPOSE SENSOR WITHIN CLASSIFIED HAZARDOUS ENVIRONMENTS.

**⚠ Warning ⚠**

- ⚠** *The rating for the relay is 60 VA, 1Amp max.*
- ⚠** *Flowline's Thermo-Flo™ flow 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*

**Technology:** The thermal dispersion flow switches measure liquid or gas temperature to determine changes in flow velocity. As fluid flows across the sensing tips, the temperature is reduced proportionately as a function of the flow rate. When a temperature or velocity shift reaches the user defined set point, the switch changes state indicating the appropriate flow condition (flow or no-flow).

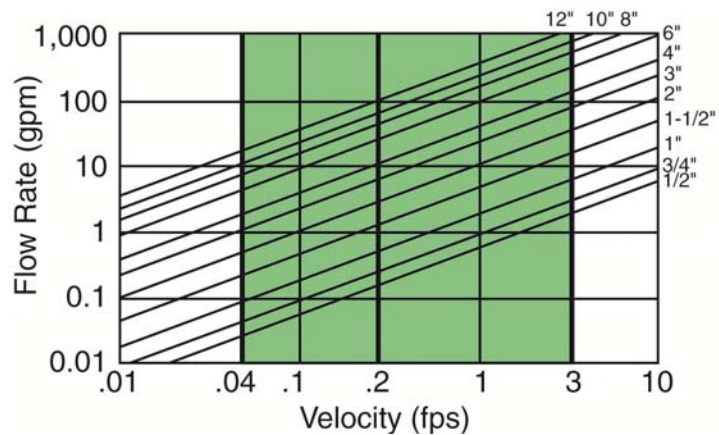
FLOWLINE's sophisticated electronics convert the temperature shift into a signal which indicates whether a flow or no-flow condition occurs. Depending on how the sensor is wired, this signal may be wired for normally open or normally closed circuits.

FLOWLINE's Thermo-Flo™ flow switches have no moving parts to clog or foul, making them suitable for a verity of applications, including non-coating and non-scaling liquids. The AT17 & AT18 series directly measure mass flow and can operate over board range of liquids from 0.4 to 1.2 specific gravity and 1 to 300 cp.

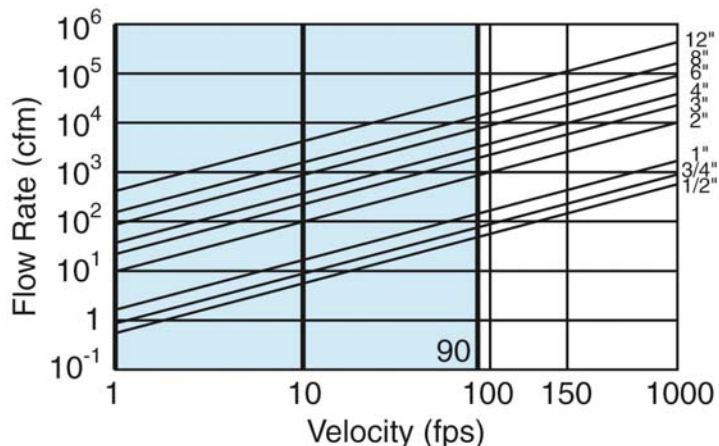
**Initializing Sequence for liquid flow switch series (AT17 & AT18):** When the flow switch is powered up while submersed, the liquid flow switch will immediately indicate flow before switching to its correct state. A time delay may be used to eliminate the initialization sequence. Flowline's thermal dispersion relay controllers feature a 0 to 60 second time delay for your convenience.

**Set Points:** The liquid flow switch (AT17 & AT18 series) set point is factory calibrated to 0.2 fps and the gas flow switch (AG17 & AG18 series) are set to 10 fps. To convert feet/sec to GPM, please refer to the chart below.

**Liquid Flow Switch  
(AT17 & AT18 series)  
Flow Rate vs. Velocity  
(gpm vs. fps)**



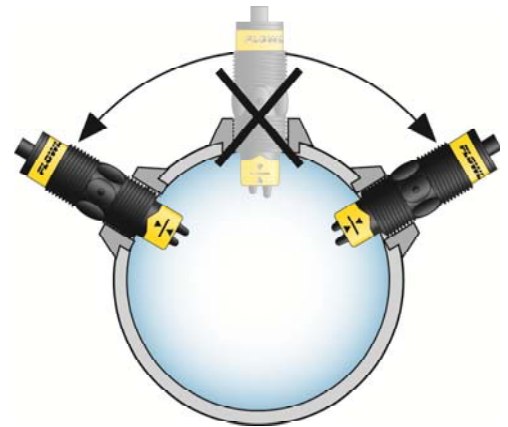
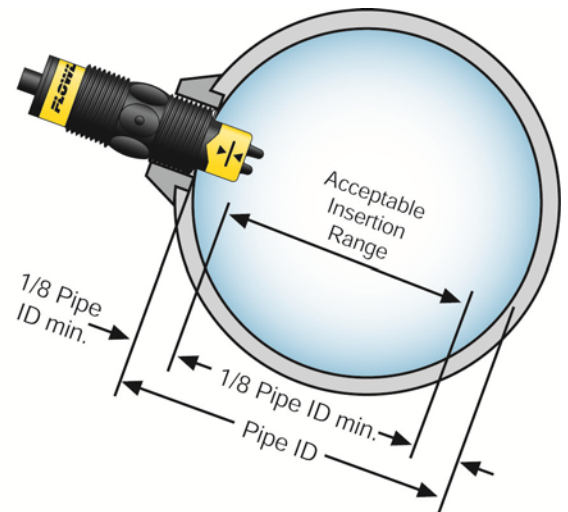
**Gas Flow Switch  
(AG17 & AG18 series)  
Flow Rate vs. Velocity  
(cfm vs. fps)**



The Thermo-Flo™ AT1\_ series liquid flow switch must always be in contact with the liquid being measured. The Thermo-Flo™ AG1\_ series gas flow switch must never be submersed in liquid. Both flow switches feature a 3/4" NPT threads which will allow it to be used with various types of fittings. Be sure to check the insertion depth of the flow switch in the fitting after it is installed. See the diagram to the right for the recommended insertion depth.

- The two tip of the sensor are to be perpendicular to the flow (as seen to the right). Never mount the tips with one in from t of the other.

When using any type of fitting, the orientation as well as the insertion depth of the flow switch in the pipe is critical. See the diagram to the right for the recommended orientation.



**Warning**

- ⚠ The flow switch tips have a thin plastic wall which may be damaged if dropped or installed improperly.
- ⚠ The **AT1\_** series flow switch is designed for use in **liquid**. For best results, avoid installing the sensor where bubbles are present or where the tips of the switch may be out of the liquid.
- ⚠ The **AG1\_** series flow switch is designed for us in **gas** applications. For best results, avoid installing the sensor where it may be submersed in liquid.
- ⚠ Always install the Viton gasket with all versions of the AT1\_ \_6\_4 or AG1\_ \_6\_4. The G threaded version will not seal unless the gasket is properly installed.
- ⚠ The two temperature probes (tips) must always be perpendicular to the flow (see the flow at the same time).
- ⚠ **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.



**Supply Voltage:** The supply voltage to the Thermo-Flo™ should never exceed a maximum of 36 VDC. Use controllers or power supplies, with a minimum output of 14 VDC or a maximum output of 36 VDC.

**Required Cable Length:** Determine the length of cable required between Thermo-Flo™ and its point of termination. Allow enough slack to ensure the easy installation, removal and/or maintenance of the sensor. The cable length may be extended up to a maximum of 1000 feet, using a well-insulated, 14 to 20 gauge shielded four conductor cable.

**Wire Stripping:** Using a 10 gauge wire stripper, carefully remove the outer layer of insulation from the last 1-1/4" of the sensor's cable. Unwrap and discard the exposed foil shield from around the signal wires, leaving the drain wire attached if desired. With a 20 gauge wire stripper, remove the last 1/4" of the colored insulation from the signal wires.

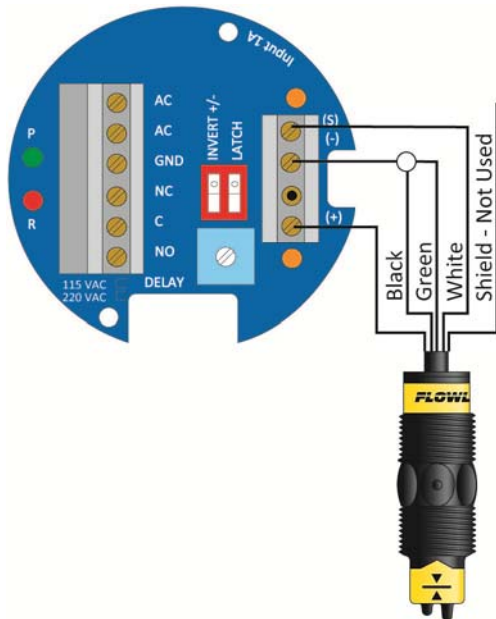
**Signal Output (Relay switching):**

Allows the sensor to switch a small load on or off directly, using an internal 60 VA @ 1A maximum relay. The NO/NC status is set by the polarity of the voltage feeding the red and black wires. The green wire is the common for the relay and the white wire is the NO or NC, depending on the polarity of red and black.

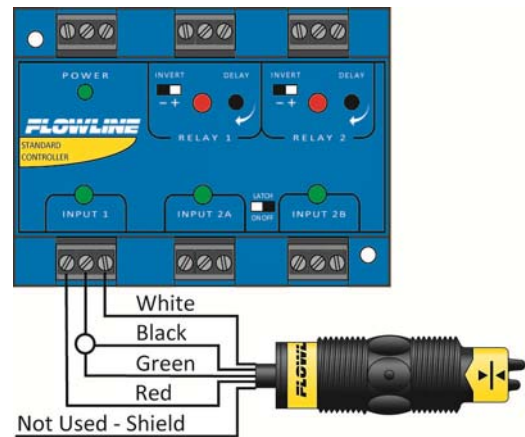
**Normally Open Wiring:**



**Wiring to a Flowline controller:  
LC30 series controller**



**LC80 series controller**



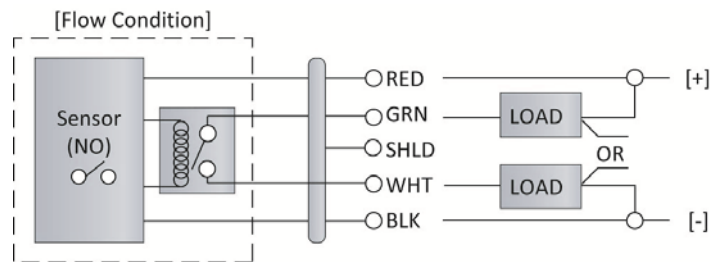


**Wiring the Relay Output:** Thermo-Flo™ can be wired as a dry contact to a VDC power source. Thermo-Flo™ does require 14 to 36 VDC power to operate the sensor and switch the relay. All illustrations below identify a Dry switch state as the normal position of the relay.

The flow switch is pre-wired to the terminal strip within the junction box. The Red and Black wires are used to provide power to the sensor. The White and Green wires are used to provide the relay contact. Polarity of the relay is set by the polarity of the power wires (Red & Black).

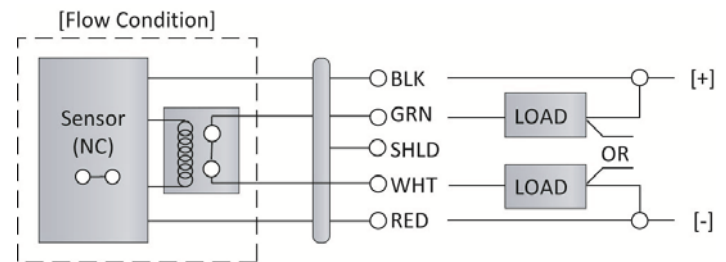
**Switching a Normally Open DC Load:**  
*(Open during Flow and Closed during –No-Flow)*

The Red wire connects to Positive (+) of the power supply and the Black wire connects to Negative (-). The LOAD can be attached to either the Green or White wires. Complete the circuit by connecting the Green to (+) VDC power or White to (-) VDC power (see illustration below).



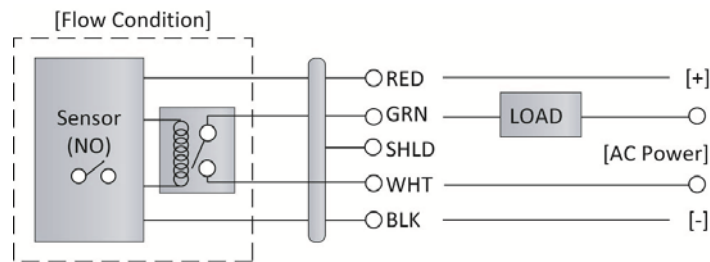
**Switching a Normally Closed DC Load:**  
*(Closed during Flow and Open during –No-Flow)*

The Black wire connects to Positive (+) of the power supply and the Red wire connects to Negative (-). The LOAD can be attached to either the Green or White wires. Complete the circuit by connecting the Green to (+) VDC power or White to (-) VDC power (see illustration below).



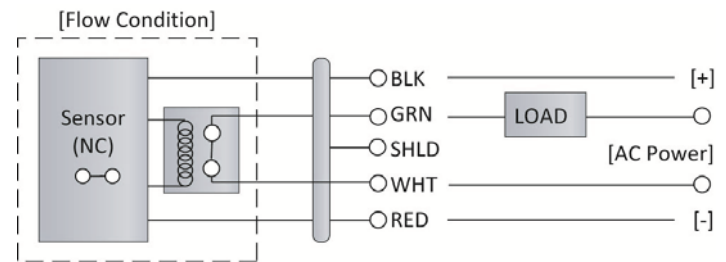
**Switching a Normally Open AC Load:**  
*(Open during Flow and Closed during –No-Flow)*

The Red wire connects to Positive (+) of the DC power supply and the Black wire connects to Negative (-). The LOAD can be attached to the Green wire and the Hot of the VAC power. Connect the White to the Neutral of the VAC power (see illustration below).



**Switching a Normally Closed AC Load:**  
*(Closed during Flow and Open during –No-Flow)*

The Black wire connects to Positive (+) of the DC power supply and the Red wire connects to Negative (-). The LOAD can be attached to the Green wire and the Hot of the VAC power. Connect the White to the Neutral of the VAC power (see illustration below).



**For all Sensor Wiring diagrams above:**

Sensor Power: Red and Black Wires (36 VDC Max., 14 VDC Min.)

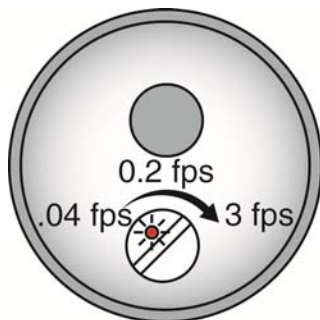
Relay Rating: Green and White Wires (60VA, 1A Max.)

**Set Points:** If the preset factory calibration is not adequate for your application, follow the calibration steps listed below. **Note:** the switch's internal LED will be on when the switch detects no-flow and will off when the switch detects flow.

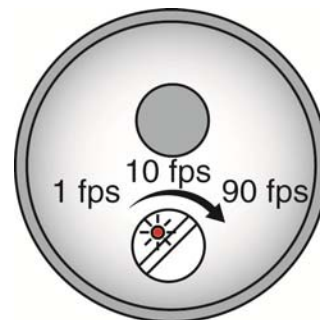
1. Install the fitting and flow switch as described in the Installation section of this manual. Turn the flow switch and controller power on and adjust the flow rate to the application setting. If the medium to be sensed is likely to be subject to high temperature variations, the flow switch should be set at the highest normal temperature likely to be encountered.
2. Locate the potentiometer knob at the top of the flow switch. The red LED is visible through the potentiometer. (If the LED is on, slowly adjust the potentiometer counterclockwise, with a small flat head screwdriver until the LED turns off.) The adjustment is a single turn 270° potentiometer. The initial response time of the flow switch after adjustment is 1 to 10 seconds. Adjust the potentiometer in slow increments and wait for the response. If the LED is off, slowly adjust the potentiometer clockwise until the light turns on. Then turn the potentiometer counterclockwise to bring the LED off at a reliable setting. Remember, adjust the potentiometer in slow increments and wait for the response.
3. Verify that the new calibration is correct by lowering the system flow rate below the set point and check to see that the red LED turns on. Then increase the flow rate above the set point and verify that the red LED turns off accordingly.



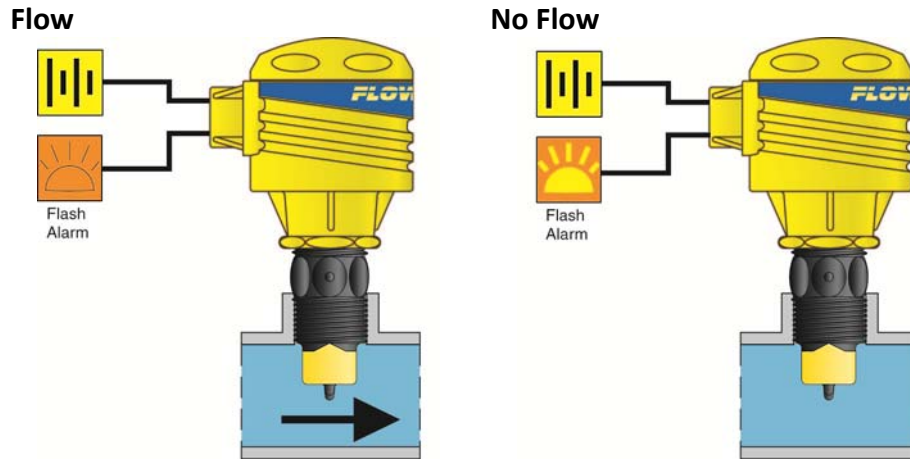
**Liquid Switch**  
AT17- \_63\_ or AT18- \_63\_ Series



**Gas Switch**  
AG17- \_63\_ or AG18- \_63\_ Series

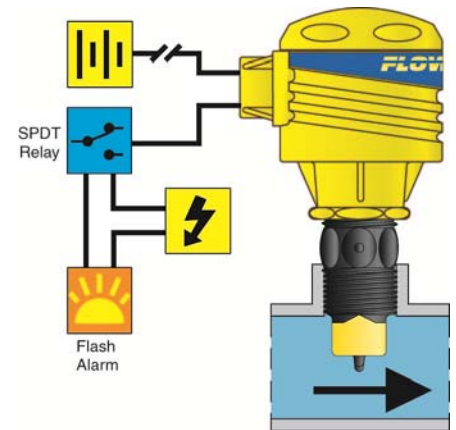


**Low Flow Alarm:** The goal is to indicate when the flow rate falls below a certain point. If it does, an alarm is supposed to light / sound, alerting the operator of a low flow condition.



If power is accidentally cut to the sensor, the sensor's ability to notify the operator of a low flow condition could be lost. The system must alert the operator not only to low flow, but to controller power loss.

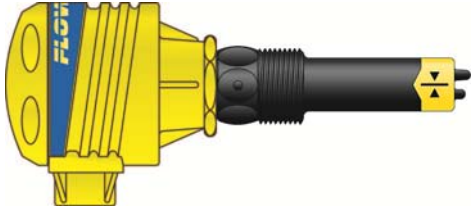
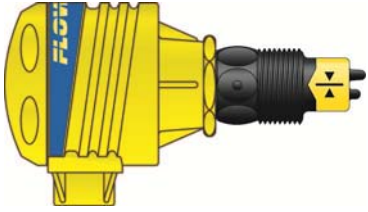
To do this, connect the relay output from the sensor to a coil side of a SPDT relay. The contact side will then connect to a separate power supply and the alarm (all in series). The alarm will sound (if there is still power to the alarm circuit itself). The alarm circuit should have a noninterruptible power supply or some other indicator or backup alarm to warn of a power failure in the alarm circuit.



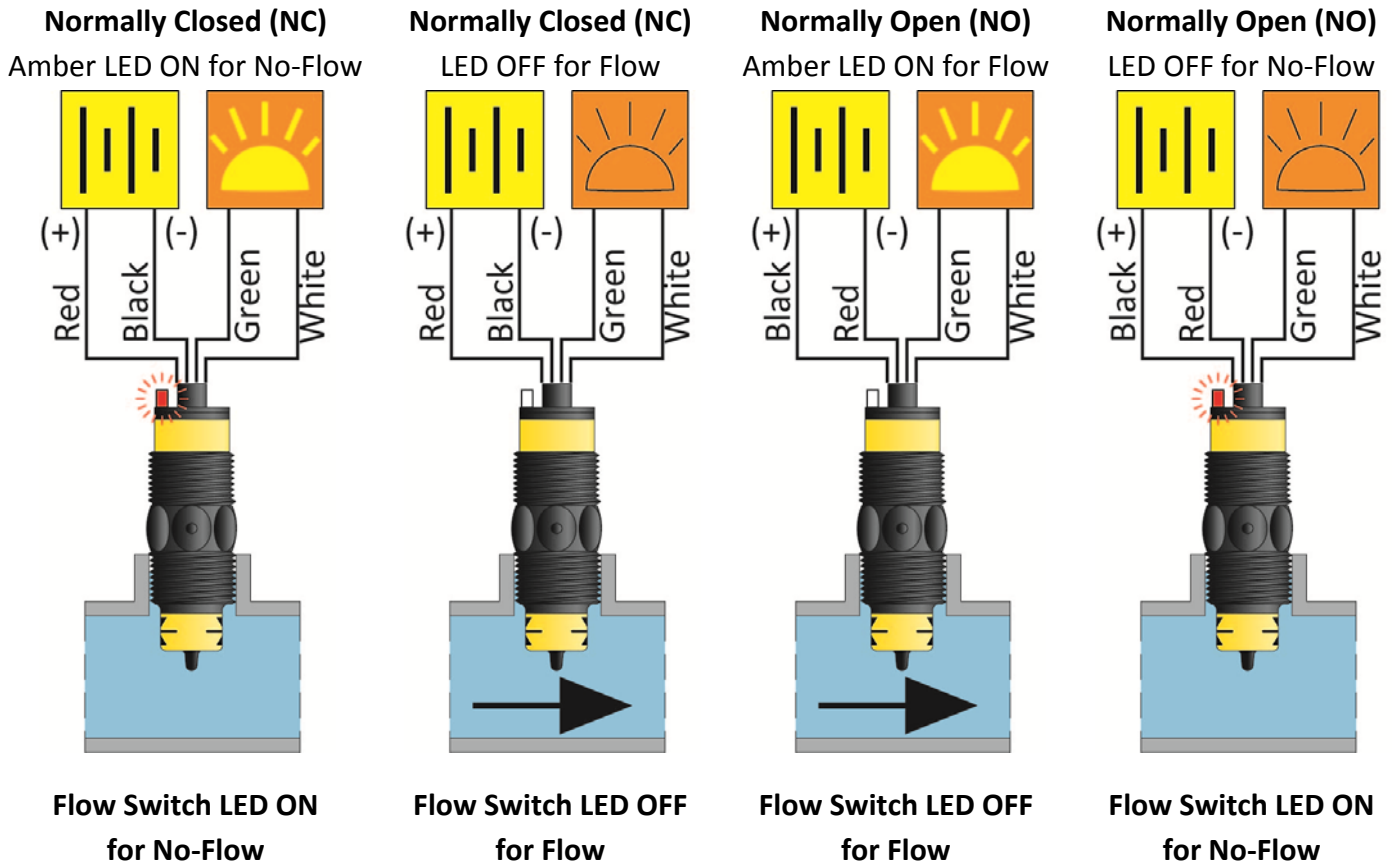
Troubleshooting:

PROBLEM	SOLUTION
The Flow or No-Flow is not switching at the correct flow rate.	The flow switch may need to be adjusted. Review the Flow Switch Calibration section on the previous page for instructions on setting the actual flow switch. Note: access to the flow switch adjustment is difficult and requires the removal of the PCB assembly. Use caution when performing this step.
Trying to start the flow but the controller keeps turning the flow off.	To restart a flow condition, the sensor needs to sense an actual flow condition before changing the relay in the controller. A flow switch over-ride may need to be added across the relay contacts that allows for a true flow to occur before switching back to the controller. The use of a moment switch is recommended for the over-ride switch.
Relay LED does not match my flow condition.	The relay LED can be switched by either the reversing the wiring of the sensor to the controller or by flipping the invert switch. This means that the relay LED can either be set to turn on during a flow condition or to turn off during a no-flow condition. This is all dependent on the wiring and the invert position.
Relay LED does not match the sensor's LED indicator.	The sensor's LED <b>will always be</b> ON during a No-Flow state and OFF during a Flow state, regardless of the switches wiring. As per above the input LED can be inverted to any condition. In some applications, they will match and in others they will be opposite. This is all dependent on the application parameter/setup.

Standard Configuration:

		Long		Short	
		Liquid	Gas	Liquid	Gas
PP-Ryton®	¾" NPT	<b><u>AT18-1630</u></b> 1 x FT10-1405 1 x LC06-1001	<b><u>AG18-1630</u></b> 1 x GT10-1405 1 x LC06-1001	<b><u>AT17-1630</u></b> 1 x FT10-1305 1 x LC06-1001	<b><u>AG17-1630</u></b> 1 x GT10-1305 1 x LC06-1001
	¾" G or Rp	<b><u>AT18-1634</u></b> 1 x FT10-1425 1 x LC06-1051	<b><u>AG18-1634</u></b> 1 x GT10-1425 1 x LC06-1051	<b><u>AT17-1634</u></b> 1 x FT10-1325 1 x LC06-1051	<b><u>AG17-1634</u></b> 1 x GT10-1325 1 x LC06-1051
PVDF	¾" NPT	<b><u>AT18-3630</u></b> 1 x FT10-5405 1 x LC06-1001	<b><u>AG18-3630</u></b> 1 x GT10-5405 1 x LC06-1001	<b><u>AT17-3630</u></b> 1 x FT10-5305 1 x LC06-1001	<b><u>AG17-3630</u></b> 1 x GT10-5305 1 x LC06-1001
	¾" G or Rp	<b><u>AT18-3634</u></b> 1 x FT10-5425 1 x LC06-1051	<b><u>AG18-3634</u></b> 1 x GT10-5425 1 x LC06-1051	<b><u>AT17-3634</u></b> 1 x FT10-5325 1 x LC06-1051	<b><u>AG17-3634</u></b> 1 x GT10-5325 1 x LC06-1051
Sensors					

**LED Indication:** Use the LED on the switch to identify the state of the flow switch (flow or no-flow). The LED is located next to the cable entry. The LED will always be ON during a No-Flow state and will always be OFF during a Flow state, regardless of polarity of the power to the sensor.



**General:** The Thermo-Flo™ flow 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 flow is off and the pressure is down prior to removing the Thermo-Flo™.* 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 Thermo-Flo™ if the threads are damaged.**
- 3. Cleaning the Sensor:** Use a soft bristle brush and mild detergent, carefully wash the Thermo-Flo™ flow 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.

**Testing the Sensor [Liquid Series (AT17 & AT18) Only]:**

- 1. Immersing the switch:** Place the switch in a cup of water. Make sure the tips are submersed in the water.
- 2. Power:** Turn on power to the switch with Red to (+) and Black to (-). You can reverse the polarity if desired.
- 3. No-Flow/Flow Test:** With the switch setting still in the cup, wait until the Red LED turns ON (no-flow condition).
  - a. Swirl the switch in the cup and wait until the Red LED turn OFF (flow condition).
  - b. Stop swirling the sensor and let it rest in the cup waiting for the Red LED to turn ON again (no-flow condition).
  - c. Repeat the above two steps.
- 4. Relay Test:** Connect a multimeter (set to read Ohms) to the White and Green Wires. Perform the above No-Flow/Flow test with the multimeter connect to observe the actuation of the relay.
  - a. With Red to (+) and Black to (-), the multimeter will read a small resistance during no-flow (closed relay) and OL during a flow condition (open relay).
  - b. Reverse Polarity [Red to (-) and Black to (+)] to see the multimeter read OL during a no-flow state (open relay) and a small resistance during a flow condition (closed relay).

The No-Flow/Flow test determines if the switch is capable of sensing the changes between no-flow and flow. The Relay test determines the ability of the relay to switch between a no-flow and flow condition. This is the basic test to determine functionality of the sensor.



**Testing the Sensor [Gas Series (AG17 & AG18) Only]:**

1. **Creating a No-Flow Test Point:** The purpose of this step is to create a no-flow state for the sensor to be tested against. Since this is a low flow switch, even a buildings HVAC system can create a flow that the sensor can read.
  - a. Place the switch on a table and place an empty cup over the sensing tips.
  - b. The cup will act like a shield to protect the sensor from air flow.
2. **Power:** Turn on power to the switch with Red to (+) and Black to (-). You can reverse the polarity if desired.
3. **No-Flow/Flow Test:** With the switch setting still under the cup, wait until the Red LED turns ON (no-flow condition).
  - a. Remove the cup and move the sensor in air and observe when the Red LED turn OFF (flow condition).
  - b. Place the sensor on the table and place the cup over the sensor and let it rest waiting for the Red LED to turn ON again (no-flow condition).
  - c. Repeat the above two steps.
4. **Relay Test:** Connect a multimeter (set to read Ohms) to the White and Green Wires. Perform the above No-Flow/Flow test with the multimeter connect to observe the actuation of the relay.
  - a. With Red to (+) and Black to (-), the multimeter will read a small resistance during no-flow (closed relay) and OL during a flow condition (open relay).
  - b. Reverse Polarity [Red to (-) and Black to (+)] to see the multimeter read OL during a no-flow state (open relay) and a small resistance during a flow condition (closed relay).

The No-Flow/Flow test determines if the switch is capable of sensing the changes between no-flow and flow. The Relay test determines the ability of the relay to switch between a no-flow and flow condition. This is the basic test to determine functionality of the sensor.

**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.)