

CAUTION

Prior to installing, the instructions provided herein should be completely reviewed and understood before operating or repairing this equipment. All CAUTION and WARNING notes must be strictly observed to prevent personal injury or equipment damage.

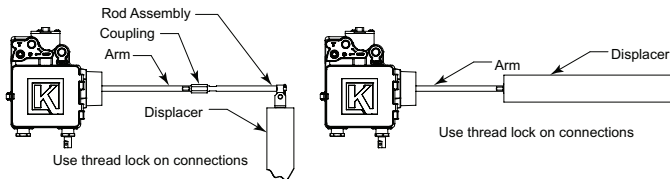
Description

The Gen 3 Liquid Level Controller is designed for use in single-phase and interface liquid control applications. The pilot is capable of both Throttle mode (modulating) and Snap mode (on/off). Pneumatic output can be set to operate as Direct Acting or Indirect Acting. The mounting body can be flipped to either Left Hand or Right Hand Mount. The displacer may be assembled in vertical or horizontal orientation. Changing between these options does not require additional components nor swapping out pilots.

CAUTION

This controller was ordered with material options selected to meet specific pressure, temperature, and fluid conditions. Do not subject the controller to conditions outside of its limits.

Displacer Assembly



Installation

NPT Connection: Apply PTFE tape or pipe compound to the male threads of the body, tighten sufficiently to seal the threads. Use a wrench on the flats of the mounting piece. Do not use a wrench on the aluminum enclosure/cover to tighten the connection. Make sure the enclosure is vertical with the pilot on top when finished.

Flanged Connection: Prior to installing, remove the masking sticker from the raised face. Use a suitable gasket between the body and the vessel connection flange.

Connections

Remove plastic plugs from 1/4" NPT openings. Use 1/4" or 3/8" tubing (not provided).

Throttle Mode: Connect supply line and pressure gauge to any of the three ports labeled "T" and plug the remaining "T" port with a steel 1/4" NPT plug. Use "S" ports for Vent.

Snap Mode: Connect supply line and pressure gauge to any of the three ports labeled "S" and plug the remaining "S" port with a steel 1/4" NPT plug. Use "T" ports for Vent.

Vent: In either mode, connect a Vent Line or Breather Plug to one of the three Vent ports, and install steel 1/4" plugs in remaining two ports.

Output: Connect pressure gauge to either port labeled "OUT", where it is easiest for operator to see. Connect output line to last "OUT" port.

WARNING

If a level controller is used in a hazardous or flammable fluid service, personal injury and property damage could occur due to fire or explosion of vented gas that may have accumulated. To prevent such injury or damage, install piping or tubing to vent the fluid to a safe, well-ventilated area or containment vessel.

Calibration

Calibrate the controller's set point with no liquid on the displacer.

Throttle Mode:

Direct Acting - Fail Closed (aka PO) Valve: With the output at 0 psi, turn the set point adjustment knob counterclockwise to produce about 10 psi. Next, turn clockwise until the output reaches 0 psi.

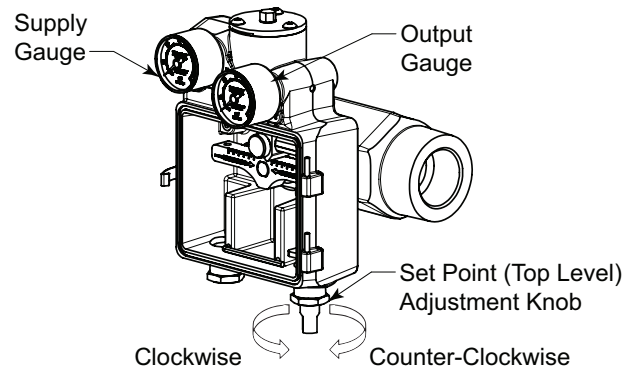
Indirect Acting - Fail Open (aka PC) Valve: With the output at 0 psi,

turn the set point adjustment knob clockwise until full output pressure is produced.

Snap Mode:

Direct Acting - Fail Closed (aka PO) valve: With the output at 0 psi, turn the set point adjustment knob counterclockwise to "snap on", producing the full output pressure. Then turn the knob clockwise until the output pressure returns to 0 psi.

Indirect Acting - Fail Open (aka PC) valve: At full output pressure, turn the set point adjustment knob counterclockwise to "snap off" the output pressure to 0 psi. Then turn the knob clockwise until full output pressure is reached.



Span Adjustment

Throttle Mode: For throttle mode, start with the sensitivity fulcrum at the center hashmark of the pilot lever. Note the current span. If span is too large, move the sensitivity fulcrum inward or outward to another hashmark. If resulting span is larger, move sensitivity fulcrum in opposite direction and note new span. If smaller, continue to move sensitivity fulcrum further in the same direction until constant level or minimum span is achieved.

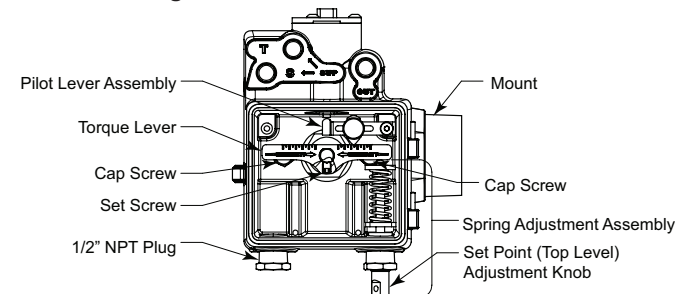
Snap Mode: For snap mode, start with the sensitivity fulcrum at the innermost hashmark. This should yield the smallest span. Adjust the fulcrum outward as need until the desired span is achieved.

Set Point Adjustment

Raise Set Point: Turn the Set Point Adjustment Knob clockwise

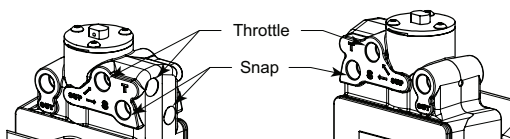
Lower Set Point: Turn the Set Point Adjustment Knob counterclockwise

Left Hand / Right Hand Conversion



1. Remove Spring Adjustment Assembly and 1/2" NPT plug
2. Remove Pilot Lever Assembly
3. Loosen Set Screw at bottom of Torque Lever and slide it off shaft.
4. Remove Cap Screws and rotate the Mount 180 degrees.
5. Reinstall Cap Screws with thread locker, replace Torque Lever, and tighten Set Screw.
6. Reassemble Spring Adjustment Assembly on same side as displacer
7. Reinstall 1/2" NPT plug on the other side.
8. Reinstall Pilot Lever Assembly on the side shown in the Pilot Lever Location table below.

Snap and Throttle Mode Switch



To switch from one mode to the other, swap all "T" (Throttle - top row) port connections with "S" (Snap - bottom row) port connections and move Pilot Lever from one side to the other. See Pilot Lever Location table below.

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Pilot Action - Direct / Indirect Switch

To switch between Direct and Indirect, move Pilot Lever from one side to the other according to the Pilot Lever Location table below.

Pilot Lever Location

Pilot Configuration	Throttle	Snap
Direct (Fail Close)	Same side as spring	Opposite side of spring
Indirect (Fail Open)	Opposite side of spring	Same side as spring

Start-up and Test

Never stand directly in front of or over a controller when the system is pressurized. The controller could suddenly open, blowing debris into the person's face and eyes.

With the installation completed and appropriate relief and check valves installed and set, slowly open the upstream and downstream shutoff valves. In order to test the function of the valve, allow only a small amount of upstream pressure to flow through the upstream shutoff valve. Check for proper valve operation by cycling the span adjustment arm several times

Paraffin Cleanout Port

The Gen 3 is equipped with an access port to give the ability to inspect and clean out the area inside the connection piece, without having to remove the unit from the vessel.

WARNING:

Make sure all pressure is released from the vessel before loosening the cleanout port plug.

Maintenance

Maintenance should be performed on a regular basis. An initial inspection interval of 6 months is recommended. Depending on the service conditions of the valve, the inspection interval may be decreased or increased.

WARNING

Before any service, be certain that all vessel pressure & instrument gas supply pressure is fully released. Never loosen or tighten any fitting or the main connections to the controller while there is pressure on the line.

CAUTION

To avoid personal injury caused by a sudden release of pressure, shut off the instrument gas supply pressure and bleed pressure from the supply lines before performing any change between snap and throttle mode.

WARNING

A leaking controller is an indication that service is required. Failure to take controller out of service immediately may cause a hazardous condition.

NOTE

Do not pick up the controller by using the displacer arm as a handle.

Only use genuine Kimray replacement parts.

Repair kits and detailed repair instructions are available for each valve.

Visit www.kimray.com or contact your Kimray authorized distributor for additional product information and / or literature.

Problem	Possible Cause(s) and Solutions
Not sending signal or venting when it should	<ol style="list-style-type: none"> 1. Insufficient supply gas pressure. Ensure that supply gas is flowing to controller and is between 15-45psi. 2. Blockage in controller passages. Inspect ports, filter, and vent plugs for any debris, clean if needed. Ensure that at least one vent port allows flow. Ensure supply gas is clean and dry. 3. Undersized displacer. If specific gravity differential is below 0.1, buoyant force from displacer may not be sufficient to activate pilot. A larger Kimray displacer may be necessary. 4. Damaged seals. Isolate and bleed pressure from pilot. Inspect pilot O-rings and diaphragms. Replace if necessary. 5. Displacer rod not able to move full range. Solids or other obstruction inside of vessel, restricting movement of displacer. Bleed all pressure from vessel and check/clean out obstruction inside vessel.
Controller does not respond quickly enough	<ol style="list-style-type: none"> 1. Improper calibration. Adjust sensitivity fulcrum per Calibration section in this guide. 2. Improperly sized tubing. Ensure tubing diameter is at least 1/4". 3/8" diameter is preferable. Minimize length of tubing between controller and valve. 3. Valve is inappropriately sized. Double check sizing of valve to ensure adequate flow rate for process conditions.
Pilot bleeds continuously	<ol style="list-style-type: none"> 1. Pilot plug and/or seat dirty. Clean pilot plug and seat, and ensure filter is clean. Instrument gas may need upstream filtration or moisture removal. 2. Damaged seals. Isolate and bleed pressure from pilot. Inspect pilot O-rings and diaphragms. Replace if necessary.
Mount shaft or plugs leaking	<ol style="list-style-type: none"> 1. Damaged seals. Bleed pressure from vessel and replace O-rings and backup rings on mount fittings.
See a more comprehensive trouble shooting list in the Installation Operation & Maintenance guide	

For questions or comments, contact your local Kimray authorized distributor, or visit www.kimray.com.

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All Pictures shown are for illustration purpose only. Actual product may vary due to product enhancement.