

Application Note

Application Note: 013107B

KAYDEN
I N S T R U M E N T S

Pump Monitoring & Protection, Remote Electronics

Application: Pump Monitoring and Pump (motor) Protection

Product: Kayden CLASSIC 800 Series Thermal Dispersion Flow, Level, Interface & Temperature Switch & Transmitter

Description:

Provide a rugged and reliable means for pump protection and monitoring.

- Shut down the pump (motor) when the inlet line is dry / empty.
- Automatically re-start the pump when the flow of the process material is restored.
- Provide an alarm when blockages occur in the pipeline.
- React to changes in the flow rate & temperature if desired.

Problem:

It is extremely difficult to find one device that can be configured for a wide variety of flow conditions and will not require frequent maintenance.

To perform well in this application the flow switch must resist failures caused by:

- Corrosion and / or “sludging”
- Vibration
- Water contamination - feed water and cooling water often contain high mineral content and sediment
- Electromagnetic interference from motors (etc).

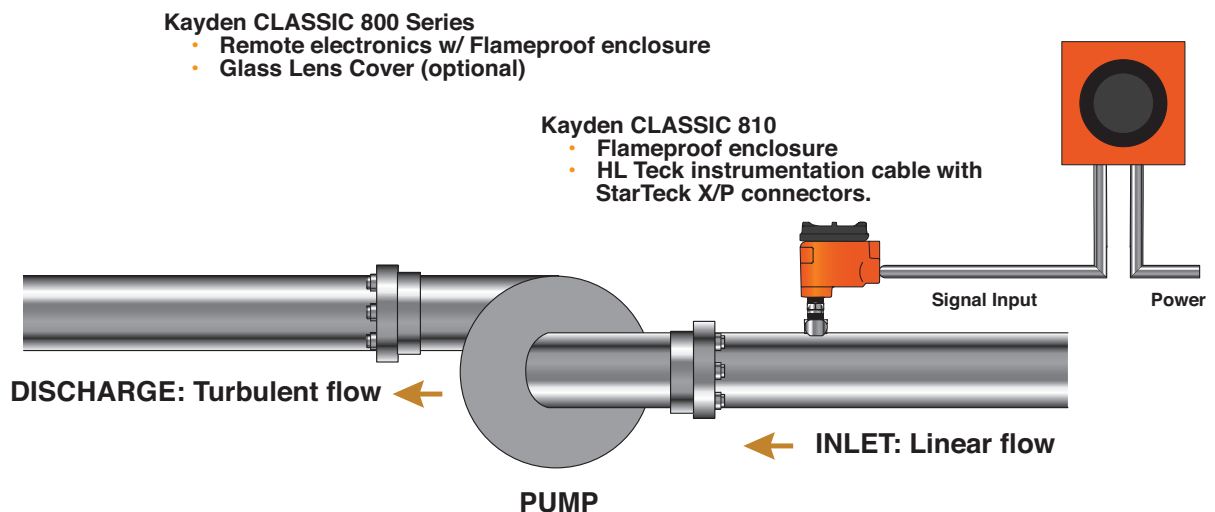


Figure 1 - Kayden CLASSIC 810 with optional Remote Electronics used in pump protection / monitoring

Solution:

Every Kayden **CLASSIC 800 SERIES** Thermal Dispersion Flow, Level, Interface & Temperature Switch is configurable by the user for flow, level, interface and/or temperature with air, gases, liquids or slurries. **The digital electronics are configured by the user for each application and are 100% interchangeable.**

- Unlike float, paddle or gap switches Kayden switches are built specifically for demanding applications in remote locations and harsh conditions while providing remote user access.
 - Easy, front panel controls and an LED display make set up fast and easy.
 - No-moving-parts design and all-welded sensors eliminate drift and sensor failures.
 - Digital electronics provide precise adjustment and optimum repeatability. No calibration is required.
 - Automatic, continuous self-diagnostics with auto-alarm function.
- The Kayden CLASSIC 800 switch may be set to alarm via either of the two (2) independent relay contacts and / or a 4-20mA analog output, on flow (increasing) or no-flow (decreasing).
- The heater power, range limits, and relay set point(s) are independently and incrementally configured and may be quickly and easily adjusted via the front panel push buttons (no trim pots!). This allows the CLASSIC 800 Series switch to achieve application-specific response times and to eliminate “nuisance alarms”.

Start-Up Bypass Timer:

The Start-Up Bypass Timer makes it possible to disable the pump on low flow and have it restart automatically after a predetermined time.

- The Start-Up Bypass Timer allows users to set the delay from 0 to 100 seconds, in 5 second increments.
- The Start-Up Bypass Timer is a programmable feature of Kayden’s digital electronics and as such requires no additional wiring or hardware.
- In the event of a power interruption the Start-Up Bypass Timer will automatically re-start the pump as desired at power-on or restart.
- During the Bypass Delay both relays are energized regardless of their mode or the value of the Thermal Signal.

Important Guidelines for Installation and Operation in Pump Monitoring Applications:

Insertion Depth / Probe “U” Length

Figure 2 illustrates a Kayden flow, level, interface and interface switch with a 4” ‘U’ installed in a 6” pipe in a typical top-mount pipe installation. It is extremely important to remember two (2) factors when determining the correct ‘U’ length:

- The dimension of the weldolet (1” in this example) must be added to the diameter of the pipe to correctly size the ‘U’ length of the flow switch. In this case the 4” ‘U’ probe will be in the center of the 6” pipe with the 1” weldolet.
- If the pipe may have flow, but not be completely full, the probe must extend far enough into the pipe that the sensors are immersed.

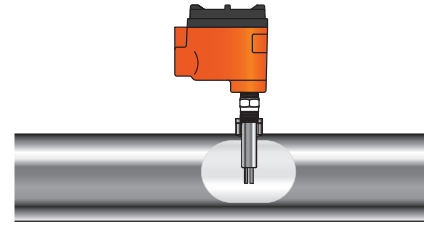


Figure 2 - Kayden CLASSIC 810 with 4”U length installed in a 6” pipe with a 1” weldolet.



Display Panel

Display Panel Indicators:

- Relay 1** On steady when Relay 1 is energized
- Relay 2** On steady when Relay 2 is energized
- Fault** Indicates a self-test error or fault condition
- Set Point 1** On steady when viewing Set Point 1
- Set Point 2** On steady when viewing Set Point 2
- Run Mode** Flashing when switch is operating
- Bypass** Flashing when the Start-up Bypass Timer is active
- Thermal Signal** Displays Thermal Signal

The Thermal Signal increases as:

- Flow** The flow rate increases
- Level** The sensor is submerged
- Interface** The sensor is submerged by the second liquid of greater thermal conductivity

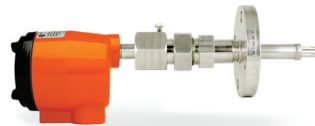
Applicable CLASSIC™ 800 Models



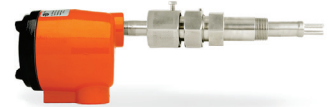
CLASSIC™ 810



CLASSIC™ 812



CLASSIC™ 814



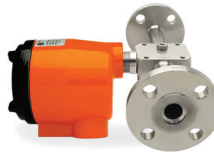
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