

Application Note

Application Note: 100206

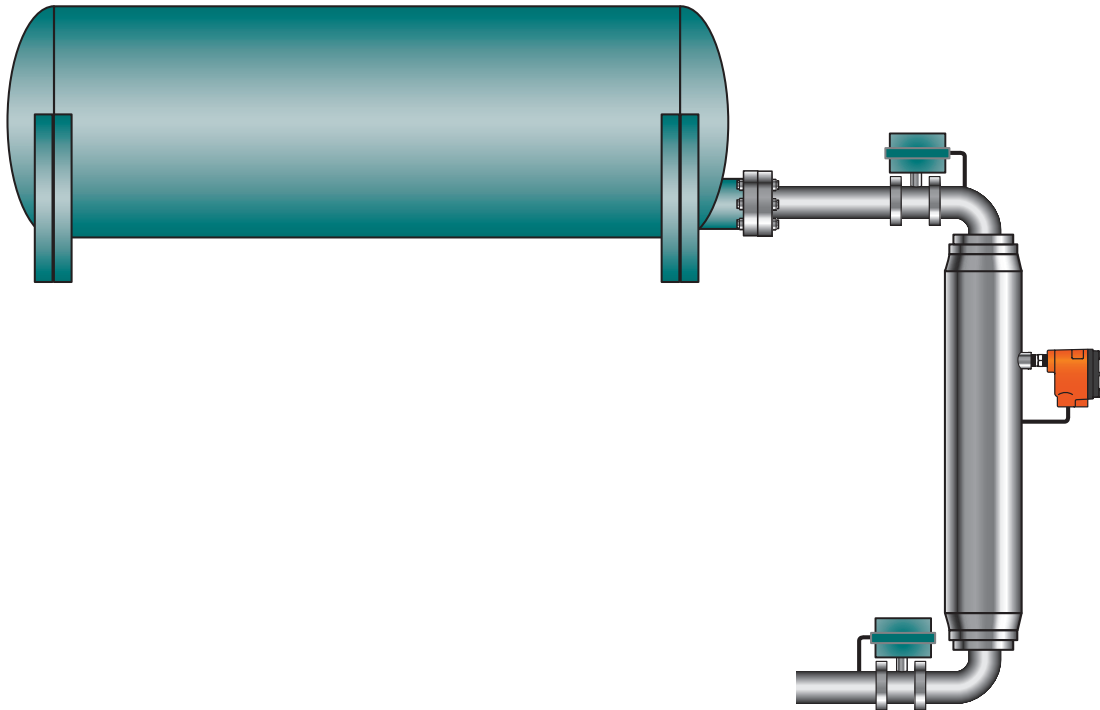
KAYDEN[®]
I N S T R U M E N T S

Acid Level Detection - Petro-Chemical

Application Overflow Level Protection, Acid

Location Refinery, Gallup, New Mexico, USA

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



Description

Reliable and repeatable level control is critical in order to prevent contamination of the process upstream or downstream. The acid must not be allowed to flow into the process except when required as a chemical additive.

Problem

Prior to Kayden, the customer tried a competitor's thermal switch and a gap switch in this application. Kayden was chosen and has succeeded where the other instruments failed:

- The Kayden CLASSIC 800 Series allows the customer to independently and incrementally adjust the level of heat, the range, and the (relay) set points to achieve high sensitivity and fast response to changes in the media level.
- Previous failures were caused when the acid literally ate through the sensors and entered the electronics enclosures. All Kayden sensors are welded (not brazed). All flanged sensors (this unit required a 3/4" flanged sensor built from Monel) are welded front and back to resist failures caused by corrosion and vibration.

For a level switch to perform well in this application it must resist failures caused by:

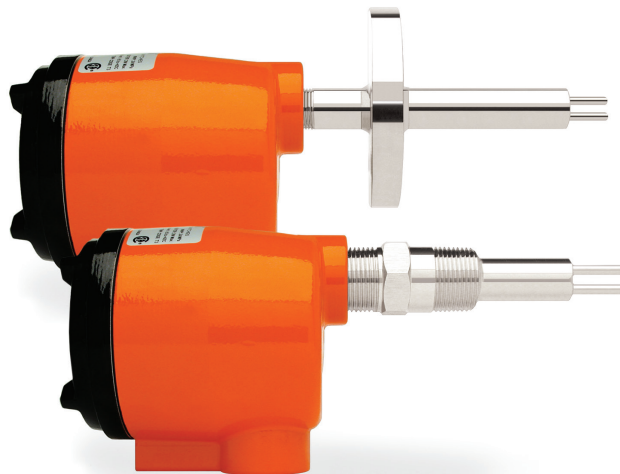
- corrosion and / or “sludging” damage to the sensor.
- temperature extremes - depending upon location and operation the instrument will see high temperatures (including steam).
- water contamination - feed water and cooling water often contains sediment and high mineral content.
- electromagnetic interference.

Solution

The Kayden CLASSIC 800 Series Thermal Dispersion Flow, Level, Interface Temperature Switch is used to provide the critical control for acid additive level. The switch is set to activate or deactivate the feed valve, either directly or as is done in this case through a master control system, using either of the independent relay contacts or the 4-20mA analog output.

Although often overlooked in level applications in favor of more complicated and expensive technologies, Kayden thermal dispersion switches provide digital repeatability and fast response in a rugged package that is not bothered by coating on the probe and will not drift, seize, or ever require calibration.

Easy, Display Panel controls and display make set-up fast and easy. Unlike float, paddle or gap switches Kayden switches feature all-welded sensors, no-moving-parts design, true digital electronics with auto-diagnostic functions, two independent relay timers, a Bypass Timer for auto pump restart, simultaneous process temperature monitor and a 4-20mA analog output corresponding to the process level (flow).





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

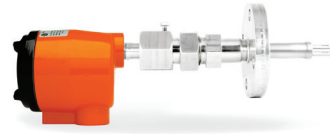
Applicable CLASSIC® 800 Models



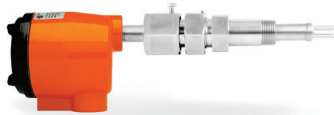
CLASSIC® 810



CLASSIC® 812



CLASSIC® 814



CLASSIC® 816



CLASSIC® 830



CLASSIC® 832

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