

## Pump Protection

### Applications:

- Pump Protection
- Dry Line Indicator
- Dry Line Alarm
- Liquid Flow Switch
- Dual Channel Liquid Flow plus Dry Line Indicator

### Application Background:

It is often desirable to monitor the flow of a liquid being pumped in a process. In addition to metering the fluid, a simple flow switch can provide confirmation of flow or flow at a minimum acceptable volume for proper operation. For added pump protection, a dry line detector, indicator, or alarm is an ideal feature, especially for larger, expensive pumps in critical applications.

### Application Solution:

There are many liquid flow monitoring technologies including: paddle/flapper types, turbine, site glass, vibrating forks, capacitance, and conductance probes. All have proven to work with varying degrees of success. Some rely on operator's time and attention, while some have mechanical parts and are prone to wear, hang-up, and failure. Still other electronic type probes require conductive fluids or fluids of specific capacitance. Most of these classical techniques also have problems at the higher operating temperatures.

A better solution for pump protection is the Thermal Differential Switch. The TD switch has two thermal sensing devices (RTD's) encased in stainless steel tips. One sensor detects the temperature of the liquid while the second has a small current applied to create a thermal differential above the liquid temperature. The differential temperature between air and liquid and liquid flowing and not flowing is different. Therefore detection of an uncovered sensor probe and a probe covered by the fluid or detection of flow and no flow is a simple, reliable technique as a pump protection system.

A flow switch with dual channels has the capability of setting two discrete flow set points. Normally the first channel would be set for "no flow" or "dry line" condition and the second channel would be set for the desired flow set point or some minimum flow to prevent the pump from cavitations.

The photo shown here is of a dual channel Versa-Switch® on the suction side of a progressive cavity pump. The user is able to monitor for the presence of the fluid thus preventing a dry pump start. At the same time the second channel is used to monitor the actual fluid flow rate and alarm if the flow drops below a minimum that might cause cavitations and possible damage to the pump.

With a single process connection into the inlet flow pipe (MNPT or flange), a Dual Channel Versa-Switch® from Delta M Corporation can provide true pump protection.

For full details go to our website, [www.deltamcorp.com](http://www.deltamcorp.com) to the products tab and look for Manuals. Find the dual channel Model VS5100 Versa-Switch® product manual. Section 4.4.5 will explain how dual set points can be established for your specific application.