

## Level and Flow Monitoring Applications

### SUMP LEVEL MONITOR

In many manufacturing facilities, sumps can be a big problem. Seldom do you know what is going to end up in the sump; it can be anything from acid to tar. In a situation like this, the DELTA M thermal differential level switch is ideal since it has no moving parts to stick and is available in many exotic materials that are compatible with most chemicals. The DELTA M multi-point level switch is ideal for these applications. The switches can have from 2 points to 6 points with 3 or 4 being very common. In power plants, for example, you may want additional points for booster or back-up points.

### DETECTION OF WATER IN FUEL TANKS

DELTA M has many customers that use our switches to determine if water is present in fuel storage tanks. Several large northern city rapid transit authorities use DELTA M switches to continuously remove water from fuel storage tanks. Two switches are mounted close to the bottom of the tank with one being slightly higher than the other. As water separates from the fuel, it settles to the bottom. When the DELTA M switch mounted higher in the tank detects water, it activates a pump which pulls the water from the bottom of the tank. When fuel reaches the switch mounted closest to the bottom of the tank, the switch senses the presence of the fuel and shuts off the pump. This allows for very inexpensive automatic control.

### POINT LEVEL FOR BACKUP OF CONTINUOUS LEVEL

While a vessel or reactor is being charged, you can compare DELTA M switch point indications to any continuous unit's output. The DELTA M switch indicating points can't change once installed making them very reliable as backups to other forms of level measurement. Example: When charging a critical reactor, the operator or, in many cases, the control system compares our switch point indications to the output from the continuous level instrument. If they agree, charge continues. If not, the reaction is aborted and a possibly serious accident is prevented.

### TRUCK & RAIL CAR LOADING SENSOR

DELTA M has a specially designed sensor for use in loading trucks and railcars. This unit has a quick locking clamp that attaches to the manhole and allows the probe to be adjusted to the desired level inside the tank. These units can be used in hazardous areas and corrosive environments. The use of these sensors has been instrumental in preventing spills caused by accidental over filling and in preventing the time and cost involved in off loading material when a truck has been filled beyond its weight restrictions.

#### LEVEL

- Tank Leak Detection
- Tank Overflow Monitor
- Truck & Railcar Loading
- Reactor/Vessel Charging
- Foam Control in Tanks
- Water Detection in Fuel Tanks
- Sump Level Monitor
- Steam Trap Level Control
- Interface Detection
- Immersion Heater Protection
- Back-up for Continuous Level



## VERSA-SWITCH<sup>®</sup>

### microtuf<sup>®</sup>

Pump Protection

Application



#### FLOW

- Pump Protection
- Cooling Water Flow
- Analytical Sample Confirmation
- Safety Shower Monitor
- Heat Transfer Fluid Monitor
- Rotating Equipment Lubrication
- Safety Relief Valve Monitor
- Flow Confirmation
- Oven Exhaust/Air Purge Monitor
- Air Handling System Monitor
- Dry Line Indication
- Soot Blower Feed Water Monitor
- Chemical Injection Monitor
- Vapor Recover Monitor
- Fire Suppression System Monitor
- Gas Purge Confirmation
- Sanitary Cleaning System Monitor

Many of DELTA M's customers are using our switches to protect their pumps. The photo on the left shows a dual channel Versa-Switch<sup>®</sup> on the suction side of a progressive cavity pump. By using the dual channel version, the customer is able to monitor the presence of fluid, thus preventing the pump from starting up dry. At the same time, the second channel of the switch is used to alarm a low flow rate, ensuring that the flow is sufficient to prevent damage to the pump. This is an inexpensive way to extend the life of all pumps. In many

installations like the one shown here, our customers install a time delay relay in parallel without switching contacts. This allows them to run the pump for a short period of time to allow priming of the pump on start up.

The DELTA M pump protection solution incorporates patented thermal differential technology that has no moving parts to wear or stick. This provides for reliable and superior performance over technologies such as pressure switches and sensors that have seals and diaphragms that may leak.

DELTA M Corporation also manufactures single channel switches for use in pump protection applications, such as low flow alarm and dry line indication. These single channel switches are more cost effective in applications that only require one alarm. The dual channel switch can also be set so that one channel alarms on temperature while the remaining channel monitors either flow or dry line conditions. These switches come standard in 316 L stainless steel with many other materials available as options. The standard operating pressure is 3000 psig and the standard operating temperature is 390°F or 200°C. Delta M also manufactures switches to operate at temperatures of 850°F or 458°C.

## **ROTATING MACHINERY PROTECTION**

Lube oil to bearings in rotating equipment is critical to maintaining proper operation. A DELTA M VERSA-SWITCH® can monitor both the flow and temperature of the oil. In some applications DELTA M customers use the temperature switch to automatically valve heat exchangers in and out to keep the oil from becoming too hot or too cool both of which can be serious issues. Knowing that you have lube oil flowing to critical mechanical components is a large part of keeping this equipment up and running thus avoiding serious and expensive down time.

## **SAFETY SHOWERS AND EYE WASH STATION MONITOR**

Often DELTA M customers want to notify others when a safety shower or eyewash station is activated. It may be extremely important to get someone to the location to assist the individual. In addition, because of the immediate danger posed to the individual's well being, he/she may not have been able to take the steps necessary to prevent an even larger spill or hazardous condition. Notifying others of the problem may prevent additional injuries and reduce or prevent fines because of a spill.

## **RUPTURE DISKS & PRESSURE RELIEF VALVE MONITOR**

Because of the reliability and durability of DELTA M switches they are ideal for these applications whether for gas or liquid service. Frequently a switch is mounted just over a rupture disk or pressure relief valve. By doing this the switch will alarm on the slightest leak notifying everyone in many cases before a full release occurs. When working with liquids, it is often best to set it up as a level switch which allows the switch to indicate a leak as soon as the liquid comes in contact with the sensor. In gas applications, it is often best to use a flow switch. With DELTA M switches, capability to indicate gas flows all the way down to .1 feet per second, the smallest leak may be detected.

## **ANALYZER SAMPLE SYSTEMS**

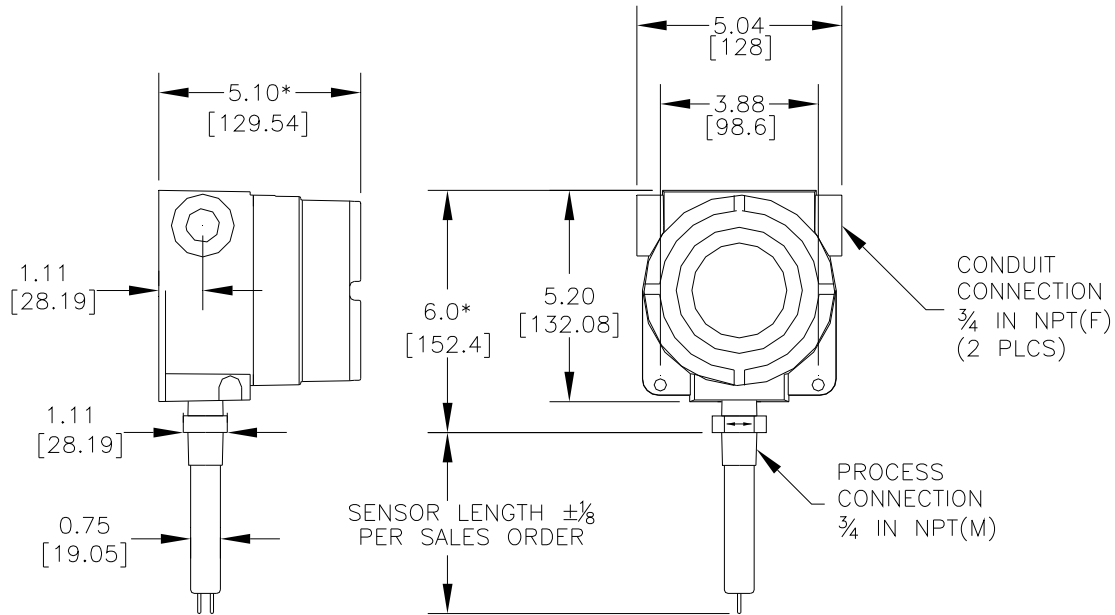
Many customers use DELTA M switches to confirm that they have flow to their analyzers from the sample systems to ensure the analyzers are receiving a representative sample of what is in the process line. If the flow to an analyzer is interrupted, the analyzer is sending data to the control system that is not likely to be representative of what is actually in the process lines. This can cause many problems: Manufacturing of off spec products, making chemical additions that could cause damage to equipment or people, having emissions that are out of range possibly resulting in serious fines, just to name a few.

## **THERMAL HEAT TRANSFER FLUID MONITORING**

Customers monitor the flow of heat transfer fluids such as Dow-Therm® with DELTA M switches. The high temperature makes this application extremely difficult for other technologies. The DELTA M switches are at home in this type of harsh environments. DELTA M's level switches are also used to monitor the fluid level in Dow-Therm® boilers thus preventing burnout.

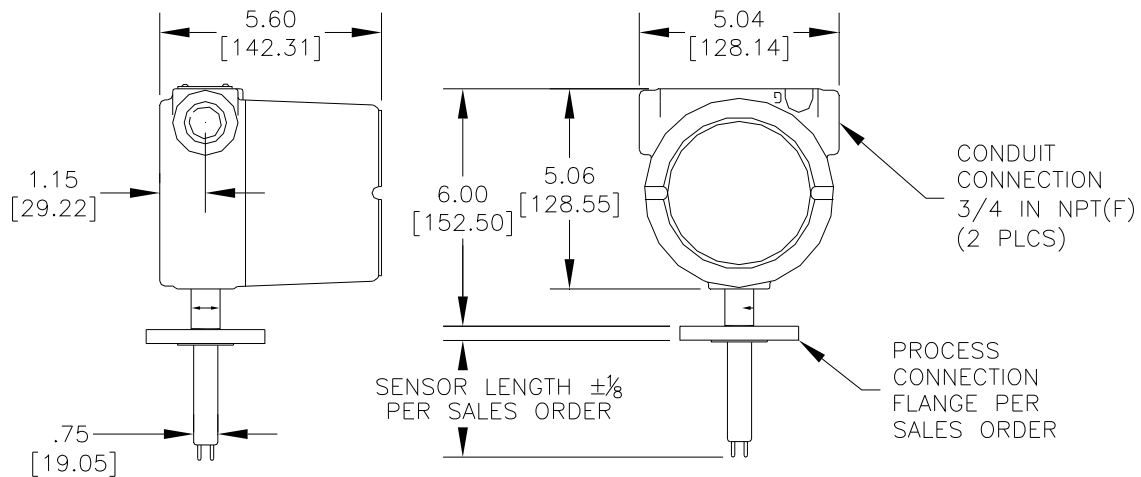
## **MONITORING OVEN EXHAUST**

Before igniting the gas in a large commercial drying oven a minimum of 3 turnovers of the air in oven must be accomplished in case there has been a leak into the oven itself. In some cases customers have used pressure switches in the exhaust stack to detect flow of air through the oven. Since this is not a direct measurement of flow, errors do occur. In some cases material coming off the products being dried can coat the pressure switch which prevents it from working and creates a very hazardous situation. A DELTA M mass flow switch can be mounted in the exhaust of the oven and be tied directly into the oven control system. With the ability of these switches to work in high temperature environments with coatings present many safety concerns are eliminated.



**NON-EXPLOSION (NX) ENCLOSURE**

\* BASED ON A FIVE-THREAD ENGAGEMENT.



**EXPLOSION-PROOF (CS) ENCLOSURE**

\* BASED ON A FIVE-THREAD ENGAGEMENT.

Dimensions in this catalog are for reference only and may be changed without notice. For certified drawings of a particular model number, contact Delta M.

Dimensions are shown in inches over millimeters.