

BENEFITS

- Detects a Liquid/Liquid Interface as it moves through a Pipeline
- Senses the Kind of Fluid Flowing in a Pipeline; Will Signal Gas, Hydrocarbon, Water, or a Mixture
- Can Signal that a Pipeline is "Empty" or "Full"
- Can Withstand Abrasion from Sand Entrained in the Flowing Fluid
- Electronic, No Moving Parts, No Pumps, Filters, Columns, Valve Ports, etc.

APPLICATION

The Delta Controls Model 633 fluid switch senses the nature of a gas or liquid contained in a pipeline. The Model 633 can provide multiple contact closures signifying the kind of fluid in the pipeline. The 633 is used instead of target type flow switches when flow detection does not provide a complete or reliable answer.

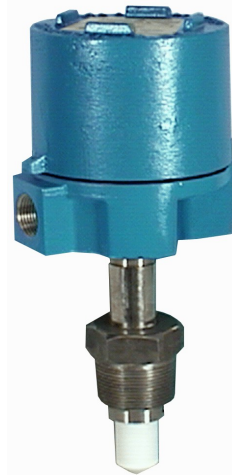
A simple application is to protect pumps against running with a dry suction. The sensor is inserted into the pump suction line; a contact closure is produced when there is no fluid present. This prevents seizing, galling, or burned seals in a dry pump.

The Model 633 fluid switch can be used to detect loss of liquid flow in a pipeline where the flow does not actually stop. An example of this situation can be found where an air pressure tank pad instead of a pump is used to move the liquid. The flow of the liquid and not of the air is the variable of interest. A target type switch is not reliable in this application because the pad air will continue to flow after the liquid supply has been exhausted. The target switch will be kept activated by the air flow. It cannot distinguish between liquid and high air flow. The Model 633 can tell the difference and will produce a reliable alarm signal.

The Delta Controls Model 633 can also detect the change in composition of the fluid. A good common application is decanting a process liquid after a water wash. The change in the flowing liquid from water to product is detected and an output contact is produced. The sensor is jacketed with PTFE for most services. It is also available with an Alumina jacket for abrasive and high temperature services.

OPERATING PRINCIPLE

The Delta Controls Model 633 is electronic and does not have any moving parts in contact with the process fluid. It has a sensor, which is inserted into the pipeline. The nature of the process fluid is determined as a function of the effect that the fluid has on a very high frequency signal impressed on the sensing probe. Adjustable setpoints operate output signaling relays. From 1 to 4 relays are available, the quantity is dependent on the function(s) to be performed.



Inserted Sensor Style,
Shown with Integral
Electronics Unit



Inline Body Style,
Shown for Use With
Remoted Electronics Unit

SPECIFICATIONS

Style: Inline body or open inserted; 316 SS is basic, Others optional, C/F

Accuracy: Better than 1/2% of range

Operating Temperature:

Electronics: -40° to 180°F (-40 to 80°C)

Process: -20 to 250°F (-28 to 120°C) Basic

-350 to 750°F (-210 to 435°C) with various options

Temperature Stability: 0.01% per °F (0.6°C)

Time Delay: Adjustable from 1 to 90 seconds

Signal Outputs: 4-20mA and/or one to four 5 amp SPDT or DPDT dry contacts

Electronic Housing: CSA Explosionproof, Class 1, Division 1, Groups BCD & 4X, IP67

Housing Location: Integral is standard; may also be remoted (cabling required for remoted)



USED TO ALARM THE PRESENCE OF A LIQUID (or Type of Liquid) -UNAFFECTED BY FLOW RATE -

Model Number System

| BASIC TYPE | SUPPLY POWER | OUTPUT CONTACTS | WETTED MATERIAL | TYPE MOUNTING | PIPELINE SIZE & CONN. | OPTIONS |
|---------------|--------------|-----------------|-----------------|---------------|-----------------------|------------------|
| MODEL EXAMPLE | 6331 | 1 | S | YD | IN 2" MPT | TE (WITH SENSOR) |

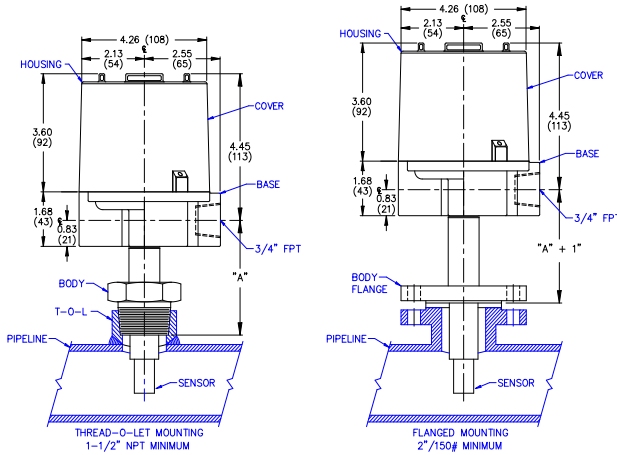
| BASIC TYPE | | TYPE MOUNTING | |
|------------------------|-----------------------|---|-----------------------------------|
| MN | DESCRIPTION | MN | DESCRIPTION |
| 6331 | INTEGRAL | IN | DIRECT INSERT, 1 1/2" NPT CONN. |
| 633R | * REMOTED | ZZ | OTHER |
| SUPPLY POWER | | OPTIONS | |
| MN | DESCRIPTION | MN | DESCRIPTION |
| 1 | 120 VAC, 50/60 HZ | AA | NONE |
| 2 | 240 VAC, 50/60 HZ | 7T | 304 S.S. HOUSING MATERIAL |
| 3 | 24 VAC | TE | HI-TEMPERATURE EXTENSION TO 350°F |
| OUTPUT CONTACTS | | ILB* | INLINE BODY SPECIFY SIZE & RATING |
| MN | DESCRIPTION | * RECOMMENDED FOR EASE OF CALIBRATION OUT OF THE PIPELINE; PARTICULARLY WITH MULTIPLE SETPOINTS, AND/OR 4-20mA OUTPUT | |
| S | SPDT - 10A @ 250 VAC | | |
| D | DPDT - 5A @ 250 VAC | | |
| mA | 4-20 mA | | |
| WETTED MATERIAL | | PIPELINE SIZE & CONN. | |
| WETTED MATERIAL | PIPELINE SIZE & CONN. | INSERTED CONN. SIZE & TYPE | |
| BODY JACKET SEALS | MIN | TYPE | 1.5" 2" 3" |
| 316 TEFLON TEFLON | YD | 150R 300R | NA NA |
| 316 ALUMINA TEFLON | YZ | 150R 300R | NA NA |

NOTE: (1) FOR OTHER SIZES, TYPES, & MATERIALS, C/F FOR NPT THREAD-O-LET & FLANGED NOZZLE WELD-ON-THE-PIPELINE FITTINGS; REFER TO THE TYPE 622 PRICE LIST.
 (2) SENSOR WILL ENTER A 1.5" NPT THREADED HOLE, A 2" SCHEDULE 120 FLANGED NOZZLE, OR A LARGER I.D. HOLE.

| SPARE PARTS-SERIAL NUMBER MUST BE PROVIDED - CLASS 11 | |
|---|-------------------------------------|
| ITEM | DESCRIPTION |
| 1 | 633-1 BASIC ELECTRONICS CARD (SPDT) |
| 2 | BASIC SENSING PROBE FOR 633 |

INSTALLATION

The sensor can be installed through branch a fitting, such as a Thread-O-Let, flanged nozzle, or a piping tee. 1.5" (38mm) or more of the sensor must extend into the pipeline. The sensor is normally installed through the wall of a pipeline. It is insensitive to position and can be mounted in any plane. It can also be installed in vertical pipelines. The flow direction may be either up or down. The minimum pipeline size is 1 1/2", Schedule 40 ANSI; there is no limit on the maximum size.



DIMENSIONS AND OPERATING CONDITIONS (-20°F Min)

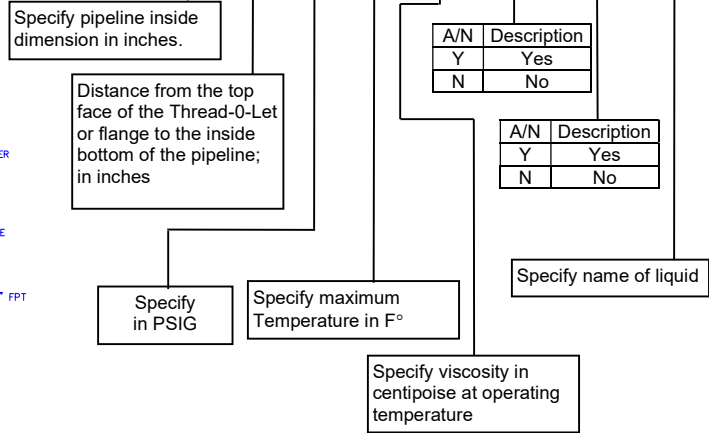
| TEMPERATURE - °F | | 100 | 250 | 350 | Higher |
|------------------|---------|------|------|------|--------|
| Maximum in PSIG | Std TFE | 1500 | 200 | 150 | NA |
| | Ceramic | 1560 | 1500 | 1500 | C/F |
| Dimension "A" | All | 5.5 | 5.5 | 8.5 | C/F |

APPLICATION DESCRIPTION

Describe the pipeline and the service details by building up an application number as shown below.

| Basic Type | Pipeline I.D. | Dim "A" | MAX Press | Liquid Temp | Liquid Visc. | Con-ductive? | Liquid Coats? | Liquid Name |
|------------|---------------|---------|-----------|-------------|--------------|--------------|---------------|-------------|
|------------|---------------|---------|-----------|-------------|--------------|--------------|---------------|-------------|

Example: 633 - 4.06 - 5.50 - 910 - 135°F - 6CP - Y - N - Dye



BODY CONNECTIONS

NPT: 1 1/2" or larger ANSI taper pipe thread
FLANGED: 2" or larger; 150, 300, or 600# ANSI; or Metric equivalent

WETTED MATERIALS (ANY COMBINATION)

BODY: Steel, 316SS, Hastelloy "C"
SENSOR SHEATH: PTFE® or Alumina*
 * Required for slurries and abrasive flows



Engineered
Reliability

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