# **Application Considerations**



# **CLASSIC**<sup>™</sup> Series

Thermal Flow, Level, Interface & Temperature Switches & Transmitters









# **Application Considerations - Flow**

# **Flow**

#### **Ideal Process Conditions**

# Liquids:

- · Consistent process composition & temperature
- Sufficient straight run flow profile (minimizes turbulence)
- Recommended minimum of 5 pipe diameters from any disturbance

#### Air & Gas:

- · Consistent process composition & temperature
- Sufficient straight run flow profile (minimizes turbulence)
- Clean and dry

#### Slurries:

- · Consistent process composition & temperature
- Sufficient straight run flow profile (minimizes turbulence)

#### **Emulsion:**

- · Consistent process composition & temperature
- Sufficient straight run flow profile (minimizes turbulence)

#### **Undesirable Process Conditions**

#### Liquids:

- Inconsistent process composition or temperature
- Insufficient straight run
- Turbulence
- Aerated fluids

#### Air & Gas:

- Inconsistent process composition or temperature
- Wet or saturated air/gas

#### Slurries:

- Inconsistent process composition or temperature
- Insufficient straight run
- Turbulence
- Aerated fluids

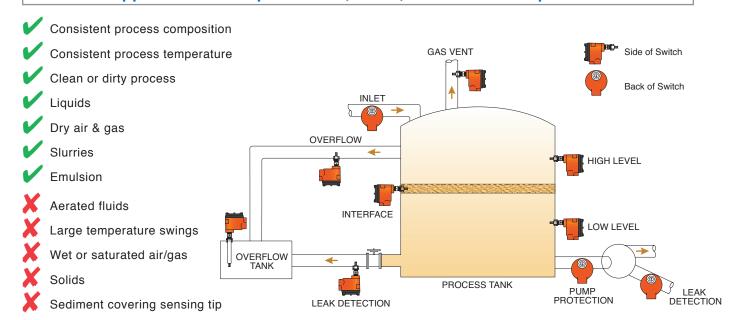
#### **Emulsion:**

- · Inconsistent process composition & temperature
- Insufficient straight run
- Turbulence
- Aerated fluids

# Solids:

 Dry granulated processes are NOT good candidates for thermal switches

# **Application Principles - Flow, Level, Interface & Temperature**



# **Application Considerations - Level**

#### Level

#### **Ideal Process Conditions**

#### Liquids:

- · Consistent process composition
- Non-turbulent

#### Slurries:

Consistent process composition

#### **Emulsion:**

Consistent process composition

# **Undesirable Process Conditions**

#### Liquids:

- Inconsistent process composition
- Turbulence
- · Large temperature swings

# Slurries:

- Inconsistent process composition
- Turbulence
- · Large temperature swings

# **Emulsion:**

- Inconsistent process composition
- Turbulence
- · Large temperature swings

#### Solids:

 Dry granulated processes are NOT good candidates for thermal switches

# **Application Considerations - Interface**

#### Interface

# **Ideal Process Conditions**

# Liquids:

- Liquid to Liquid:
- Consistent process composition & temperature
- Non-turbulent applications
- · Large differential in thermal conductivities

# Air or Gas to Liquid:

- · Consistent process composition & temperature
- · Non-turbulent applications
- Dry gas

# **Emulsion:**

- Consistent process composition & temperature
- · Large differential in thermal conductivities

# **Undesirable Process Conditions**

#### **Liquid to Liquid:**

- Inconsistent process composition or temperature
- High aeration
- High turbulence
- Small differential in thermal conductivities

# Air or Gas to Liquid:

- · Inconsistent process composition or temperature
- High turbulence

#### **Emulsion:**

- Inconsistent process composition or temperature
- High aeration
- High turbulence
- Small differential in thermal conductivities

#### Solids:

 Dry granulated processes are NOT good candidates for thermal switches



#### **GENERAL INSTALLATION GUIDELINES**

Kayden electronics are designed to be universal for flow, level, interface and temperature applications and with most liquids, gases and slurries. The user can take advantage of this flexibility through:

- Correct setup of the electronics and
- · Proper physical installation of the sensor.

#### Location:

- Consider the need for easy access in order to view the operation and make any required field adjustments.
- Provide at least 12 inches (30 cm) clearance if possible to allow access for setup and viewing after installation.

#### **Shock and Vibration:**

Install the switch/transmitter so as to minimize any effects due to vibration, shock and extreme temperatures.

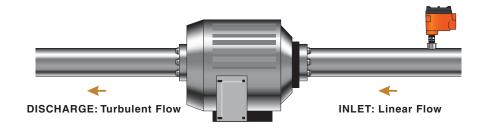
#### Temperature:

- The continuous operating temperature limits of the Electronics Module is -55°C to +65°C (-67°F to +149°F). Ambient temperatures in excess of +65°C (+149°F) require the electronics to be mounted remotely from the sensor. Consult kayden.com or the factory for more information.
- The continuous operating temperature limits of the sensors are -45°C to +200°C (-50°F to +392°F).

#### **Turbulence / Interference:**

- Pumps, fans, valves, or pipe bends of 90° or more will cause turbulence or significant variance in the flow which will affect the repeatability of the switch/transmitter. Care should be taken to minimize this possibility.
- For Pump Flow/No-Flow detection the best/preferred installation point is on the inlet side of the pump. The discharge side will have turbulence, reverse flow and an undeveloped flow profile. These factors will greatly reduce repeatability and accuracy.
- Keep the sensor away from any devices that may cause physical damage such as: agitators, valves, injectors, etc.

Note: Many times, especially when replacing a different type of instrument, the installation point is predetermined and is difficult to change. Kayden switches/transmitters have specific design features that allow them to perform well even in difficult locations and applications. Please consult your local representative or Kayden for questions or installation / setup recommendations.



Note: For full installation instructions refer to the CLASSIC Series Product Manual on kayden.com