CTC AppNotes

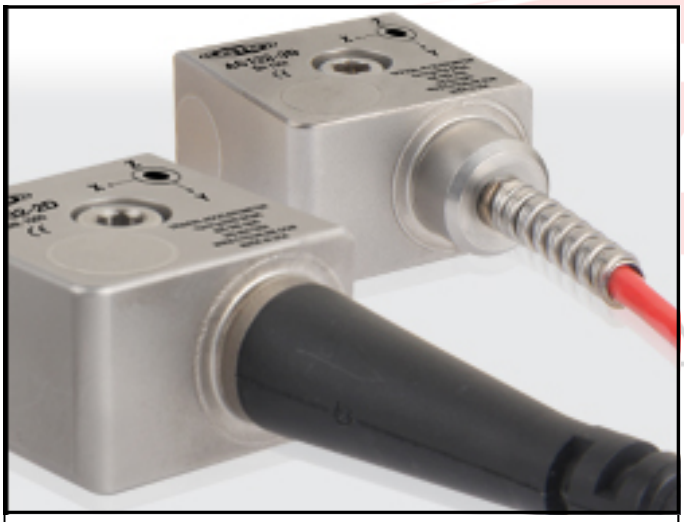
A series of technical documents written by members of the CTC community

Using Integral Cable Sensors in Underwater Applications

Underwater applications for vibration sensors can be problematic at times. As the sensors require some type of power, the possibility of water ingression into either the sensor or cable makes failure a frequent possibility, especially in applications where water turbulence or inclusions may be an issue. With that in mind, proper preparations can greatly increase the chances of successfully installing sensors for long term monitoring of pumps and other underwater machinery.

Integral Cable Sensor Selection

Selecting the proper sensor for the application is the first step. Many articles have been written on choosing the right sensor for machinery based on operating speed and other factors, but what we are concerned with here is the physical properties of the installation site. Key factors to consider are:



CTC offers several different integral cable options depending on where the sensors may be submerged.

1. Liquid that the sensor will be immersed in
2. Possible "inclusions" in the submersing liquid
3. Depth of submersion.

For clean freshwater submersion, the primary cable choice will be the integral polyurethane jacketed cable. For seawater, armored Teflon-jacketed cable is preferred as polyurethane can deteriorate over time in seawater. Should there be "inclusions" such as may be found in wastewater treatment plants, natural freshwater lakes, rivers and streams, integral armor may be preferred as well.

Sensor mounted on pump—Note the paint has been removed and a flat spot has been milled into the surface of the flange for better data transmission.

Integral Cable Sensor Installation

The next most important factor to be considered is the sensor installation. While epoxy or magnet mounting may be useful in rare situations, either method can allow the sensor to become dislodged over time. The best method for installation is mounting the sensor in a hole that has been drilled and tapped in one of the machine bearings or flanges. Cables should be carefully routed and protected for the run out or up to the point where they can be terminated in a junction box of some sort.

Axial and radial sensors installed on a pump- -Note the carefully routed cabling and the excellent protection of the cables within a few inches of where they exit the sensors.

If you have any questions or for further information please contact CTC directly via Email at dgripe@ctconline.com or jsmith@ctconline.com or feel free to call 1-800-999-5290 in the US and Canada or +1-585-924-5900 internationally.