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

Using Accelerometers in High Temperature Applications

Executive Summary

Many industries have rotating machinery designed to operate at temperatures well above the usable ranges of standard IEPE (internal electronics piezo– electric) accelerometers. These applications usually involve machinery that reaches surface temperatures well above 300degrees F (151C). Typical applications include gas turbines, boilers, steam pumps and other machines that can be critical to operating efficiently. For applications such as these, CTC offers several versions of specialty high temp accelerometers.

Introduction

For some high temperature applications the internal electronics of the IEPE sensors are subject to failure at the elevated temperatures. . CTC's high temperature accelerometer solutions have a fundamentally different construction to solve this problem. The design separates the sensing element from the electronics, with the two permanently connected by a hardline mineral insulated cable. The current offering of these sensors allow the sensor head to be mounted on surfaces with temperatures as high as +350C (+650°F). Due to this separation, the electrical part of the sensor can be installed in a cooler location. This permits the operation of these sensors at significantly higher temperatures while providing overall system performance comparable to CTCs standard accelerometers.

HA602-Charge Amplifier .

Overview

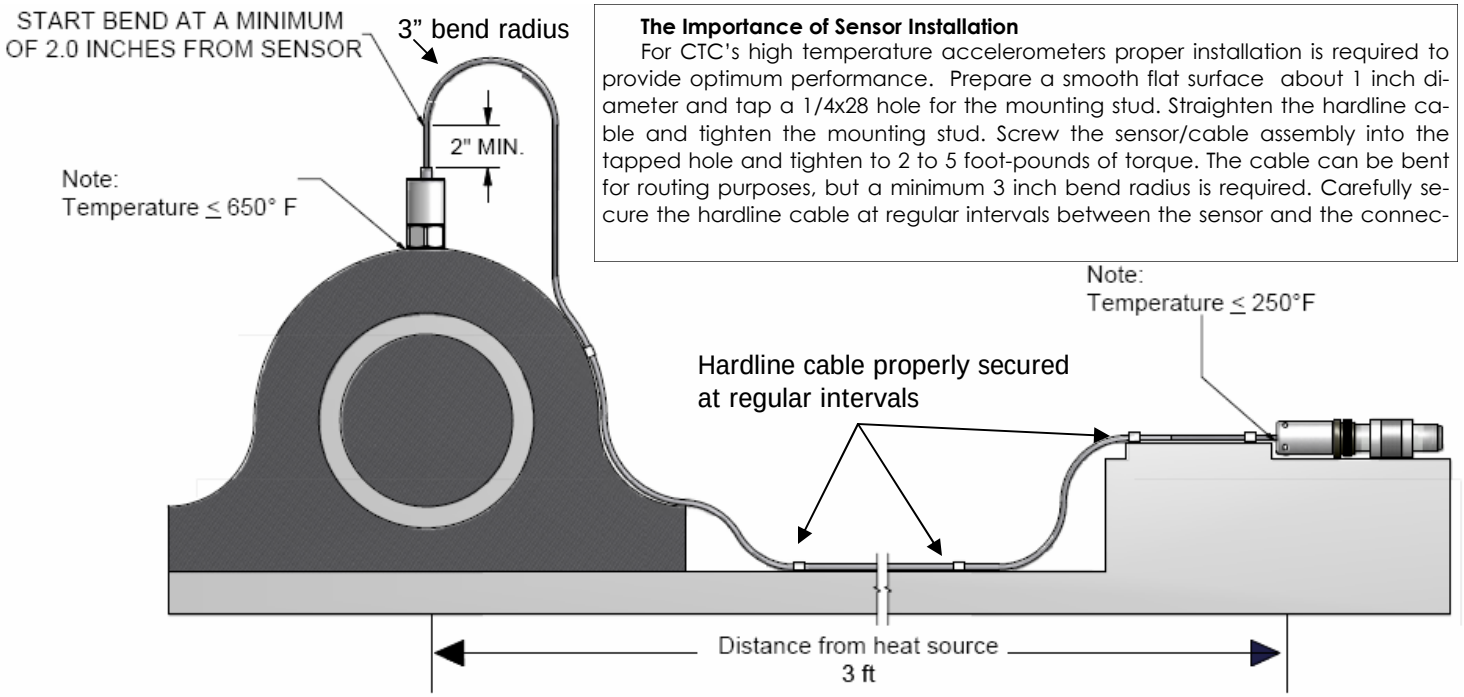
CTC's flexible, hardline integral cable system ensures that the resistance is controlled and constant to the external electronics (HA602 series charge amplifiers), providing superior signal quality and reliability. The integral cable provides optimal reliability by positioning the connector from 4 feet(1.2 meters) standard length, up to 32 feet(10 meters) (special orders only) from measurement point outside of the high temperature environment. Mineral insulated cable, similar to that used with many thermocouples, protects conductors from the environment in order to ensure stable internal resistance levels. The flexible, hardline cable provides rigidity and helps protect data from tribo-electric effects. CTC uses a proprietary compression design and special build techniques to ensure precise and reliable data in the harshest environments, while reducing the effects of thermal transients.

Parts List:
CM362-7A; HA602-A100; HA602-A050; HA602-V100

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.

The Importance of Sensor Installation

For CTC's high temperature accelerometers proper installation is required to provide optimum performance. Prepare a smooth flat surface about 1 inch diameter and tap a 1/4x28 hole for the mounting stud. Straighten the hardline cable and tighten the mounting stud. Screw the sensor/cable assembly into the tapped hole and tighten to 2 to 5 foot-pounds of torque. The cable can be bent for routing purposes, but a minimum 3 inch bend radius is required. Carefully secure the hardline cable at regular intervals between the sensor and the connec-



If any PRO product should ever fail, we will repair or replace it at no charge,as long as the product was not subjected to misuse, natural disasters, improper installation or modification which caused the defect.

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