

Knowledge Base Article

Product Group: Sensors

Product: Sensors Accessories

Version: N/A

Abstract

This article provides information on ground connections for sensors using non-isolated, isolated, and double shielded cable assemblies.

Overview

The most common sensor cable assemblies are either isolated or non-isolated.

In this context, the term "isolated" refers to whether the outer shield of the cable is connected to machine ground through the sensor body (non-isolated) or disconnected from machine ground and the sensor body (isolated).

Improper use of the outer shield of the sensor cable can allow false signals to be superimposed on the vibration signal.

A shield with no ground connection can cause heightened sensitivity to outside signals (floating ground).

A shield with multiple ground points can induce a false vibration signal due to differing ground potentials (ground loops).

Non-isolated Cable Assembly

The non-isolated cable assembly is quite popular. [Figure 1]

The cable shield depends upon a solid shield ground through the sensor mounting and the machine ground.

No shield ground connection is made at the monitoring instrument end of the cable, although a high-frequency bypass capacitor is occasionally used.

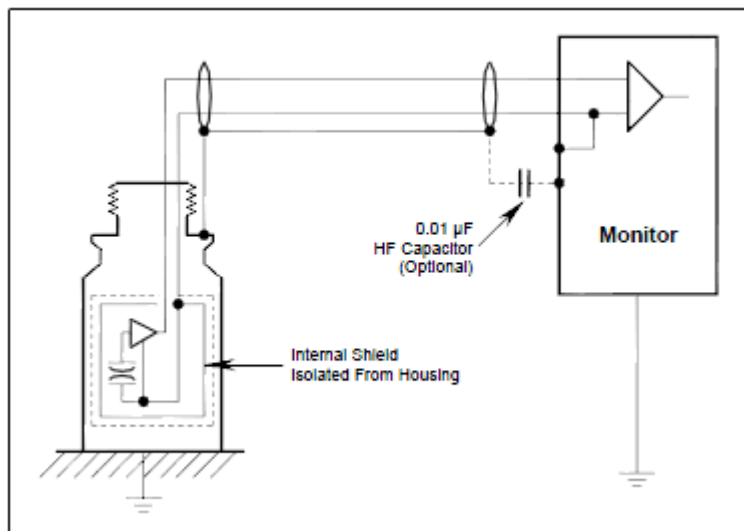


Figure 1. Non-isolated cable grounded at the machine

Isolated Cable Assembly

The isolated cable assembly is also popular. [Figure 2]

The cable shield is isolated from the sensor body and machine ground.

A high quality instrumentation ground at the monitoring instrument is used to ground the cable shield.

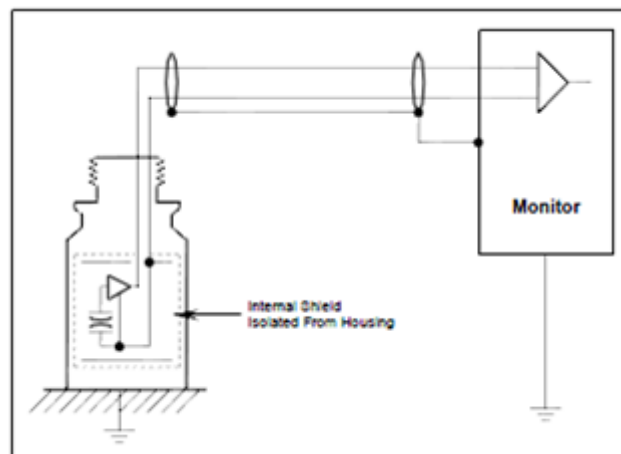


Figure 2. Isolated cable grounded at the Monitor

Double Shielded Cable Assembly

When additional shielding is required, the double shielded cable assembly is appropriate. [Figure 3]

It is essentially a combination of the isolated and non-isolated cable assemblies.

The inner cable shield is isolated from the sensor body and machine ground.

A high quality instrumentation ground at the monitoring instrument is used to ground the inner cable shield.

The outer shield is non-isolated and depends upon a solid shield ground through the sensor mounting and the machine ground. [Figure 4]

No outer shield ground connection is made at the monitoring instrument end of the cable, although a high-frequency bypass capacitor is occasionally used.

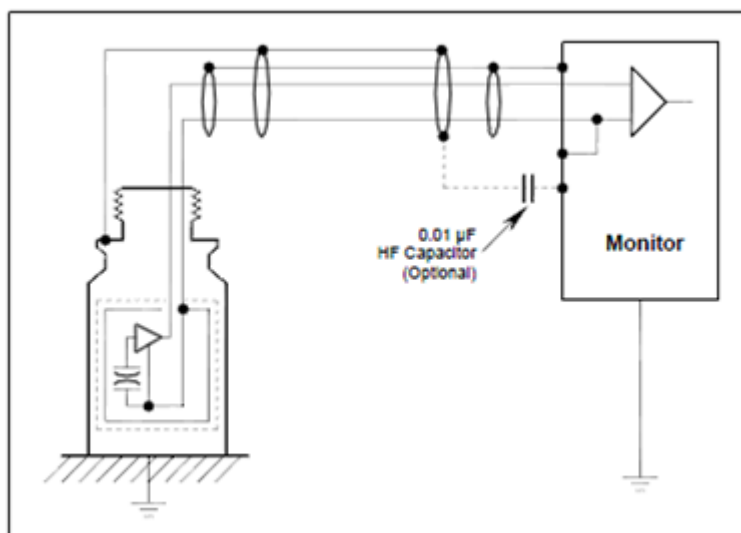


Figure 3. Double shielded cable with shields independently grounded

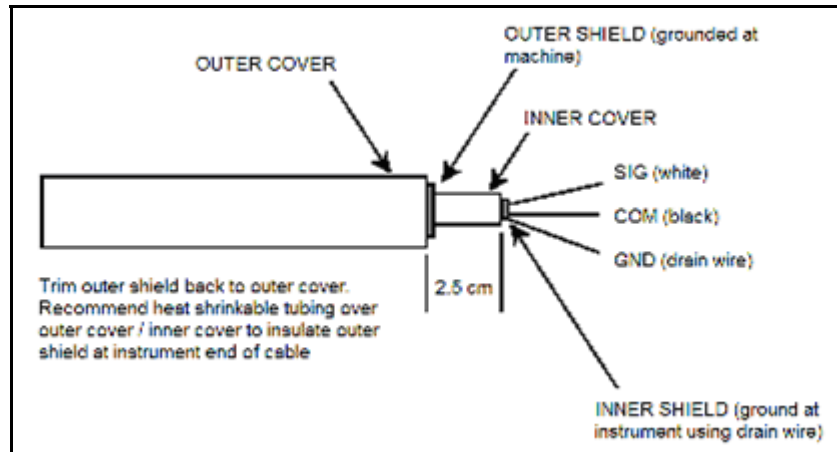


Figure 4. Typical double shielded cable trim at instrument end

For further assistance, please contact the Technical Support Group by phone at 1-800-523-7514 option 8, or by email at tsg-americas@skf.com.

