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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.

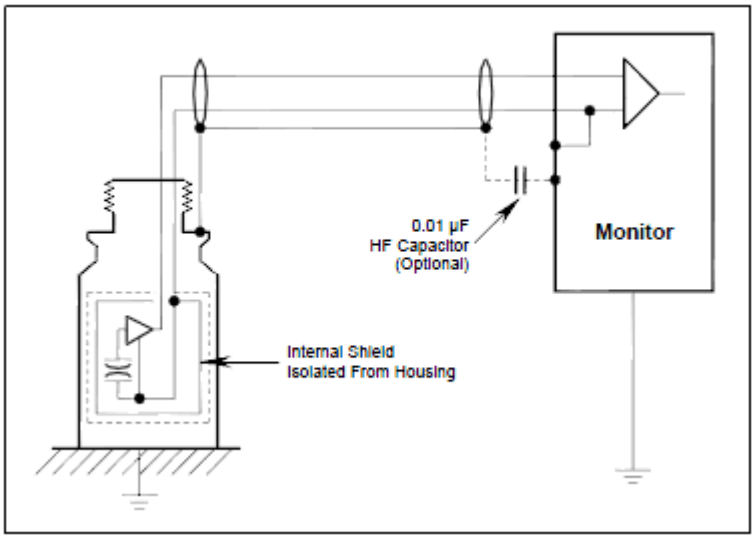

Figure 1. Non-isolated cable grounded at the machine

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.

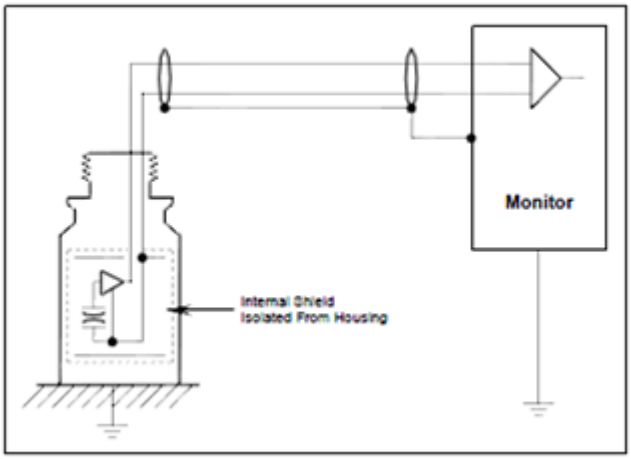

Figure 2. Isolated cable grounded at the Monitor

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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.

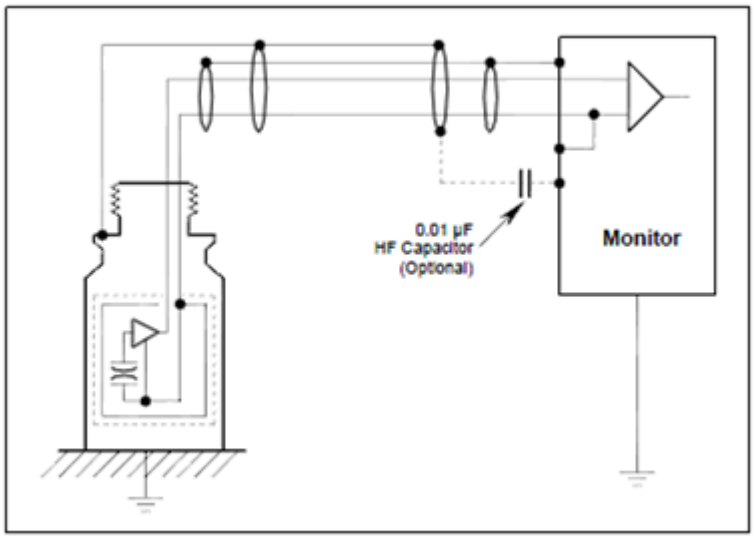

Figure 3. Double shielded cable with shields independently grounded

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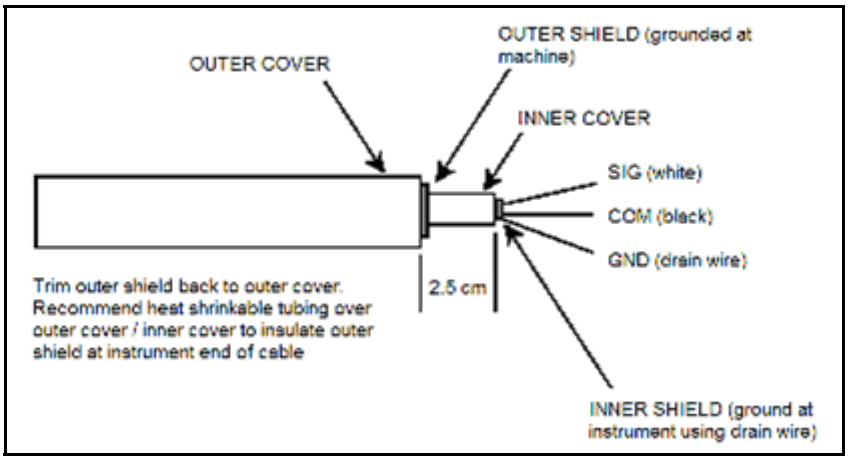

Figure 4. Typical double shielded cable trim at instrument end

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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.