INSTRUCTION and INSTALLATION BULLETIN

ISB-101

Intrinsic Safety Barrier For Magnetic Pickups

IMPORTANT

READ CAREFULLY AND COMPLETELY BEFORE INSTALLING, CONNECTING, OR TESTING THE INTRINSIC SAFETY BARRIER

ISB-101 Intrinsic Safety Barrier is a solid-state energy-limiting device for connection between transmitters, alarms, controllers, etc. located in nonhazardous areas (or packaged inside hazardous area enclosures) and intrinsically safe magnetic pickups located in a hazardous area (Fig. 1).

CSA approved Class I, Division 1, Groups C & D when used as a safety barrier for Dynalco speed sensors: M104, M134, M135, M139, M140, M160, M180, M201, M202, M203, M204, M205, M231, M233, M337, M341, and M342.

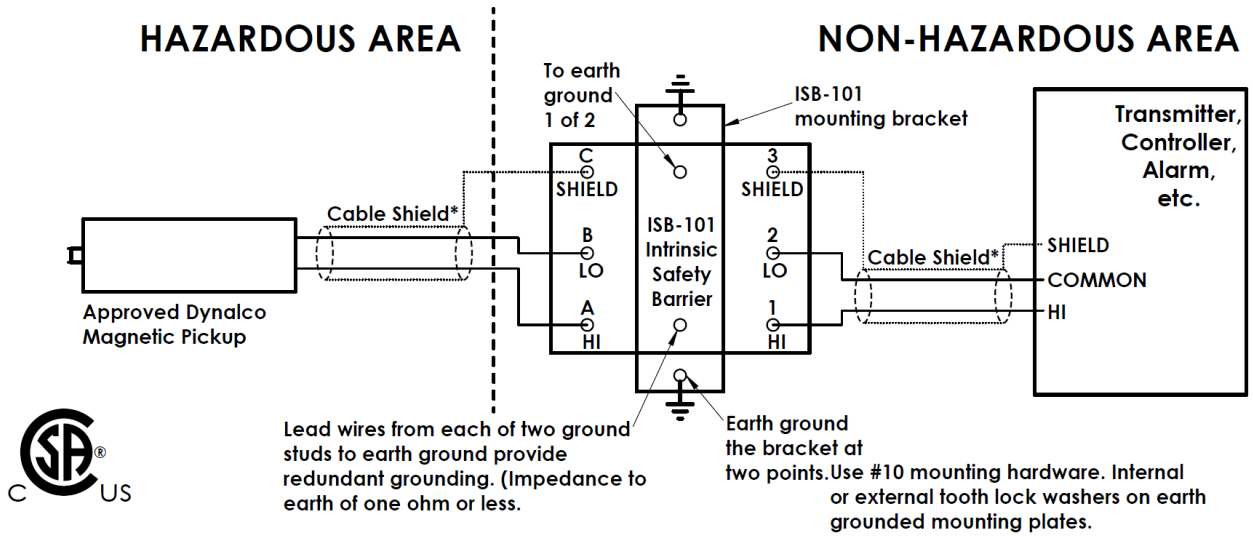

Figure 1. Hazardous area-safe area layout and connections

***** Maximum field wiring capacitance = 0.5 microfarads
***** Maximum field wiring inductance = 2000 microhenries.
***** System is safe whether the shield is grounded or not. However, from an electrical noise viewpoint, the cable shield should be totally insulated from ground, make no connection at the pickup end, and connect exclusively to the designated terminals on the barrier and the instrument.
The barrier output cannot exceed 14 VDC *or* 85 milliamperes under normal or abnormal conditions, even with up to 150 Vrms appearing accidentally at the input.
Ambient temperature operation: –40 DegF to +180 DegF (–40 DegC to +82 DegC).
Unauthorized equipment connections to the magnetic pickup signal terminals may impair intrinsic safety.
MAINTENANCE: No Maintenance is required other than periodically checking the ground bonding and making sure that the unit and its connections are clean and in good physical and electrical condition.

INSTALLING THE INTRINSIC SAFETY BARRIER

(a) Both barrier and instrument must be installed in nonhazardous area with barrier located as close as possible to where the field wiring enters the nonhazardous area.
(b) Observe grounding of mounting bracket and redundant lead wire grounding as shown in Figure 1.

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TESTING AN INSTALLED BARRIER

All parts meet the following test—which need not be applied to installed barriers to retest their integrity and performance—but which may be applied during troubleshooting procedures.
WARNING: Testing should never be conducted with the barrier connected and active; use of instruments between input and output terminals will bypass the barrier and will violate intrinsic safety.
NOTE: Any testing must be done with the circuit inactive, with all wiring disconnected from the barrier (except the earth-grounding mounting tabs and the ground wires) and using:

- a DC voltmeter.
- a ground-free 14.0 VDC power supply.
- an ohmmeter.

AN ACCEPTABLE BARRIER PASSES ALL OF THE TESTS IN THE FOLLOWING PROCEDURE

(a) Disconnect all leads from the barrier except the earth-grounding mounting tabs and ground wires.
(b) Measure the resistance between terminals 1 and A; and between 2 and B.
In both cases the resistance should be 175 ohms +10 ohms. (+ instrument tolerance).
(c) Measure the resistance between terminals 2 and 3; and between B and C.
In both cases the resistance should not exceed one ohm.
(d) Using a 10K ohm, ¼ watt limiting resistor—in series—apply 14.0 VDC (measure the supply before applying the voltage) across terminals A(+) and ground.
(e) Measure the voltage from 1(+) to ground.
The voltage reading should be between 11.0 and 12.6 VDC
(e) Keeping the 10K ohm limiting resistor in the circuit, apply 14.0 VDC across B(+) and ground. Measure from 2(+) to ground.
The reading should be between 11.0 and 12.6 VDC
(f) Remove the 14.0 VDC power and then the 10 K ohm limiting resistor.
(g) Measure the resistance between the mounting bracket (tab) and earth ground reference.
Resistance must be less than one ohm.

Reconnect all leads to the barrier after completing the tests above.

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