INTRINSIC SAFETY BARRIER

ELECTRONIC MODULES

Introduction

This Intrinsic Safety Barrier Module is the perfect complement to our Intrinsically Safe Encoders and, when used together, constitutes a completely engineered solution for encoder operation in Class I and Class II, Division 1 (Zone 0) Hazardous Environments. This single barrier provides both power and signal isolation for an incremental encoder with differential quadrature outputs and an index. This all-in-one approach saves the cost, inconvenience and system design time needed when using separate power and signal barriers. This barrier is galvanically isolated which eliminates the added cost of maintaining a high integrity earth ground. With differential line driver outputs, this barrier can be used to carry signals reliably up to 500 feet with a bandwidth of up to 250 kHz. It is designed around a standard DIN Rail mounting (Type EN 50022, 35 mm X 7.5 mm) for easy installation in standard enclosures. A length of DIN rail is supplied with each module. The module simply snaps directly to the DIN rail and is ready to use.

The Intrinsic Safety Barrier Module is also certified to be installed in Class I, Div. 2 (Zone 2) areas.

When properly connected, differential data signals have an inherent immunity to noise since it is rejected as common mode. However if a connection between the encoder and the barrier is broken or improperly terminated it can act as an antenna and still create a signal. An open wire detection (ISD) option is available on BEI's Intrinsically Safe Barriers (28V/V and 28V/5 only). In the event that the data line is cut or not properly connected the ISD option can detect a change in the impedance of the connection and cause the output data on both legs of the differential signal to go low. This creates an erroneous logic state that can be used by the operator to halt or modify a process.

SPECIFICATIONS

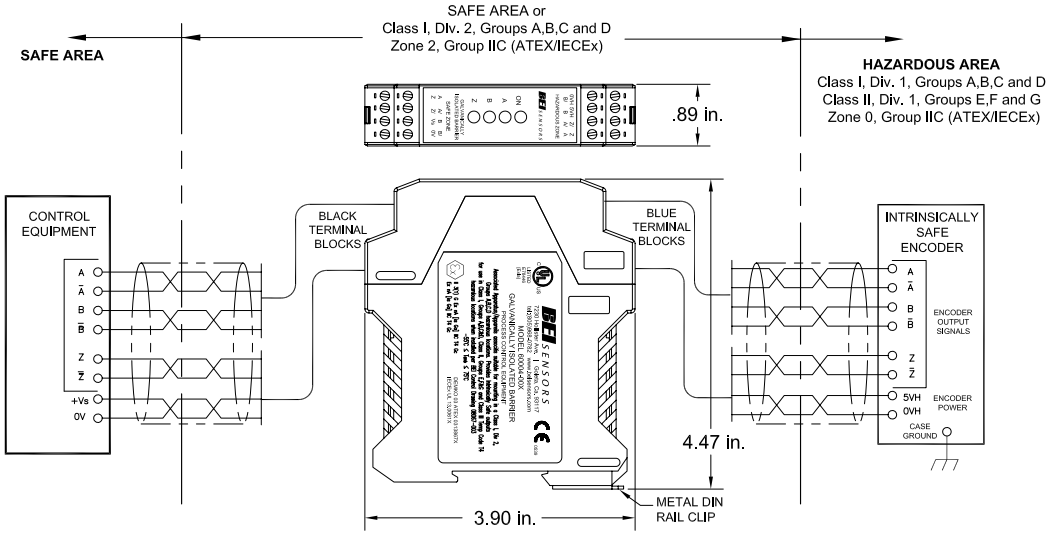
Power Supply / Output Type			
Part Number	**Barrier Supply: Vs ±5%**	**Output logic to Non-hazardous Area Apparatus**	
60004-002	12-28 VDC	Vout = 5V	Line Driver up to 100 mA source/sink (TTL & RS422 compatible)
60004-003		Vout = Vin	Line Driver up to 100 mA source/sink
60004-004		Open Collector	NPN up to 80 mA sink
60004-005		Vout = 5V	Line Driver up to 100 mA source/sink Open wire detect option
60004-006		Vout = Vin	Line Driver up to 100 mA source/sink Open wire detect option
⚠ Caution: Operation above or below barrier supply voltage (Vs) range noted will cause permanent damage to barrier			

Barrier Parameters											
			Class I, Gp D Class II, Gps E,F,G Group IIA			Class I, Gps C,D Class II, Gps E,F,G Group IIB			Class I, Gps A,B,C,D Class II, Gps E,F,G Group IIC		
Barrier Output (Po)	Voc (Uo)	Isc (Io)	Ca (Co)	La (Lo)	L/R Ratio	Ca (Co)	La (Lo)	L/R Ratio	Ca (Co)	La (Lo)	L/R Ratio
870 mW	9.48 VDC	367 mA	255 uF	2.1 mH	327 uH/Ω	27 uF	1.05 mH	160 uH/Ω	3.7 uF	0.26 mH	40.8 uH/Ω

Input to Barrier from Encoder	
Signals	A, B, Z, A/, B/, Z/ differential or A,B,Z single-ended
Input Signal Impedance	500 Ω nominal (A to A/, B to B/, Z to Z/)
Input Signal level	4 VDC minimum, 6 VDC maximum

GENERAL WIRING DIAGRAM

(see BEI Sensors drawing 08067-003 for important details)



ORDERING OPTIONS

Example : EM-DR1-IS-5-RTB-28V/V

Use this diagram, working from left to right to construct your model number

EM - DR1 - IS - 5 - RTB -

Type

EM = Electronic Module, DIN Rail mount

Package Style

DR1 = 114.5 mm x 99mm x 22.5 mm

Function

IS = Intrinsically Safe
ISD = Intrinsically Safe with Open Wire Detection
(available with 28V/V or 28V/5 supply voltage/output)

Output Voltage to Encoder

5 = 5 VDC

Output Termination

RTB = Remove Terminal Block

Voltage/Output

28V/V = 12-28 VDC, Vout = Vin
28V/5 = 12-28 VDC, Vout = 5 volts
28V/OC = 12-28 VDC, Vout = Open Coll.

AGENCY APPROVALS & CERTIFICATES

This Intrinsic Safety Barrier has certifications to be used as an associated apparatus for intrinsically safe encoders installed in the following hazardous locations:

US Class I, Group A,B,C,D;
Class II, Groups E,F,G; Class III

Canadian Class I, Zone 0, Group IIC

II 3 (1) G Ex nA [ia Ga] IIC T4 Gc

Ex nA [ia Ga] IIC T4 Gc

EN 55011 and 61000-6-2

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Specification No. 02125-004 Rev:04/09/19

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