

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
<p>⚠ Caution: Operation above or below barrier supply voltage (Vs) range noted will cause permanent damage to barrier</p>			

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

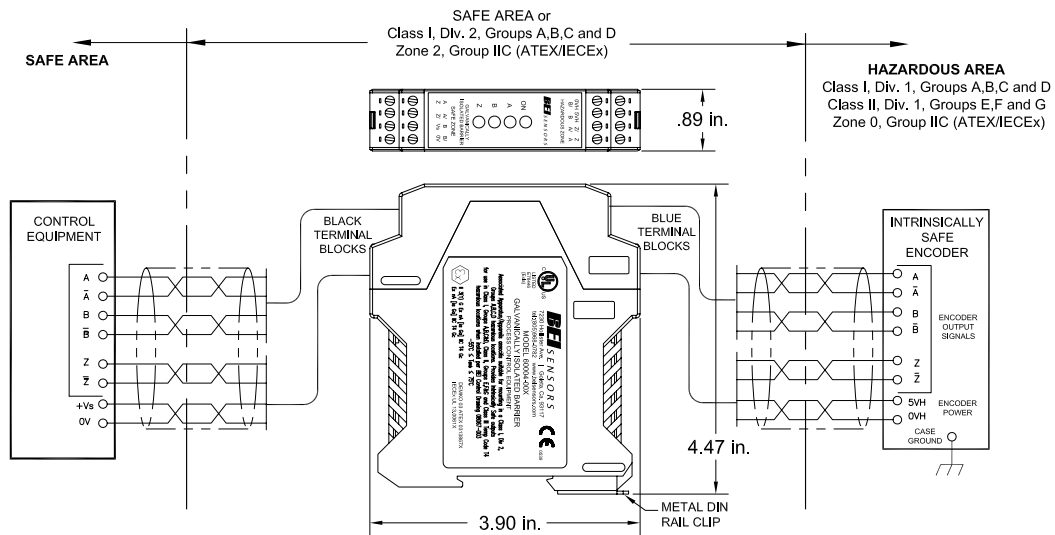
Input to Barrier from Encoder

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)

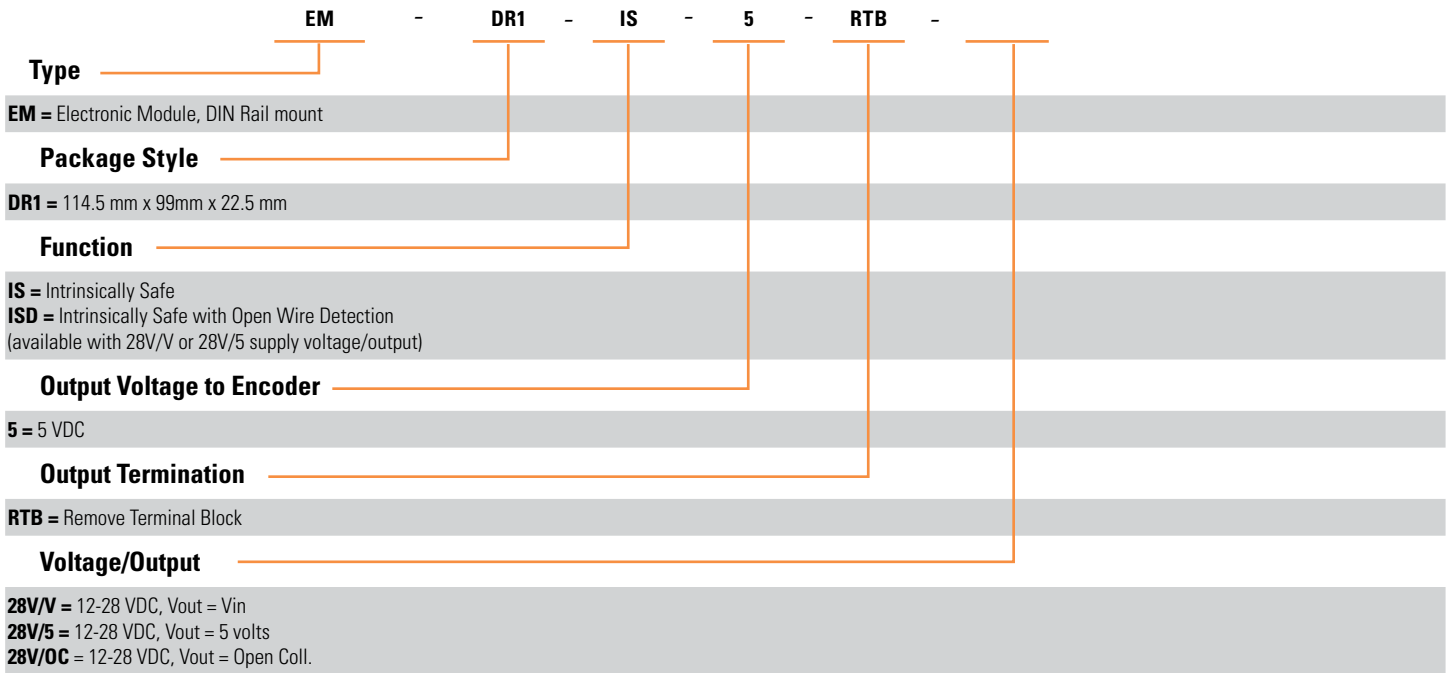




ORDERING OPTIONS

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

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



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



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



Canadian Class I, Zone 0, Group IIC



Ex nA [ia Ga] IIC T4 Gc



EN 55011 and 61000-6-2

Made In France

Sensata Technologies, Inc. ("Sensata") data sheets are solely intended to assist designers ("Buyers") who are developing systems that incorporate Sensata products (also referred to herein as "components"). Buyer understands and agrees that Buyer remains responsible for using its independent analysis, evaluation and judgment in designing Buyer's systems and products. Sensata data sheets have been created using standard laboratory conditions and engineering practices. Sensata has not conducted any testing other than that specifically described in the published documentation for a particular data sheet. Sensata may make corrections, enhancements, improvements and other changes to its data sheets or components without notice.

Buyers are authorized to use Sensata data sheets with the Sensata component(s) identified in each particular data sheet. HOWEVER, NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE TO ANY OTHER SENSATA INTELLECTUAL PROPERTY RIGHT, AND NO LICENSE TO ANY THIRD PARTY TECHNOLOGY OR INTELLECTUAL PROPERTY RIGHT, IS GRANTED HEREIN. SENSATA DATA SHEETS ARE PROVIDED "AS IS". SENSATA MAKES NO WARRANTIES OR REPRESENTATIONS WITH REGARD TO THE DATA SHEETS OR USE OF THE DATA SHEETS, EXPRESS, IMPLIED OR STATUTORY, INCLUDING ACCURACY OR COMPLETENESS. SENSATA DISCLAIMS ANY WARRANTY OF TITLE AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUIET ENJOYMENT, QUIET POSSESSION, AND NON-INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY RIGHTS WITH REGARD TO SENSATA DATA SHEETS OR USE THEREOF.

All products are sold subject to Sensata's terms and conditions of sale supplied at www.sensata.com SENSATA ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR THE DESIGN OF BUYERS' PRODUCTS. BUYER ACKNOWLEDGES AND AGREES THAT IT IS SOLELY RESPONSIBLE FOR COMPLIANCE WITH ALL LEGAL, REGULATORY AND SAFETY-RELATED REQUIREMENTS CONCERNING ITS PRODUCTS, AND ANY USE OF SENSATA COMPONENTS IN ITS APPLICATIONS, NOTWITHSTANDING ANY APPLICATIONS-RELATED INFORMATION OR SUPPORT THAT MAY BE PROVIDED BY SENSATA.

Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA.

CONTACT US

Americas

+1 (800) 350 2727 – Option 1
sales.beisensors@sensata.com
Europe, Middle East & Africa
+33 (3) 88 20 8080
position-info.eu@sensata.com

Asia Pacific

sales.isasia@list.sensata.com
China +86 (21) 2306 1500
Japan +81 (45) 277 7117
Korea +82 (31) 601 2004
India +91 (80) 67920890
Rest of Asia +886 (2) 27602006
ext 2808

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Sensata:](#)

[60004-003](#) [60004-002](#) [60004-004](#) [60004-002C](#) [60004-005](#)