STAHL Intrinsically Safe Zener Barrier

9002-77-093-300001

Overview

The Zener Barrier provides intrinsically safe operation of thermocouple applications or any other intrinsically safe device that falls within the safety data and electrical data parameters of the Zener Barrier.

This compact, space-saving device is easy to install on a DIN rail. Simply snapping the barrier onto a grounded DIN rail provides a connection to ground.

Features

- Space-saving design
- Easily grounded via the DIN rail
- Convenient grounding lugs on top and bottom of barrier
- Only one type of exchangeable fuse – allows reduced stocking requirements and eliminates risk of errors during fuse replacement

The Zener Barrier must be grounded in accordance with Article 504/505 of the National Electrical Code or the Canadian Electrical Code, Part 1, whichever applies. There are multiple ways to ground the Zener Barrier:

- The DIN rail connection can provide a path to ground if the DIN rail is properly grounded.
- Ground the Zener Barrier by utilizing the top or bottom grounding lug.

Refer to the installation manual for full installation instructions.
NOTE: An isolator barrier can be used if grounding is unavailable.

STAHL Intrinsically Safe Zener Barrier Selection Guide

Part Number	Price	Signal Type	Field Device Example	Drawing
9002-77-093-300001	$210.00	Temperature input (mV signal)	Ungrounded thermocouple	PDF
9002/13-280-110-001	$269.00	Binary input (3-wire prox) Binary output 4-20 mA input or output	PNP prox sensor, solenoid valve, indicators 4-20 mA transmitter 4-20 mA positioner	PDF
9002/11-280-186-001	$213.00	Binary input (NPN sensors or dry contacts)	Dry contact NPN prox sensor	PDF
9002/22-158-200-001	$201.00	11V pulse train	15.8 entity parameter	PDF
9002/22-240-024-001	$201.00	18V pulse train	24V entity parameter	PDF
9002/11-130-360-001	$252.00	Strain gauge	Load cell, 10VDC excitation	PDF
9002/11-120-024-001	$252.00	Strain gauge	Load cell, 10VDC signal	PDF

Replacement Fuses

STAHL Zener Barrier Replacement Fuses Selection Guide

Part Number	Price	Quantity Per Package	For Use With
158964	$42.00	5	STAHL Zener Barriers

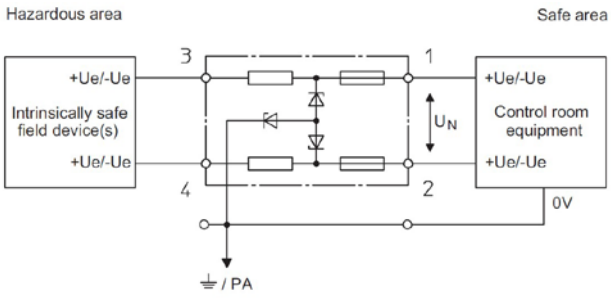
158964

STAHL Intrinsically Safe Zener Barrier

STAHL Intrinsically Safe Zener Barrier Specifications								
		9002-77-093-300001	9002/13-280-110-001	9002/11-280-186-001	9002/22-158-200-001	9002/22-240-024-001	9002/11-130-360-001	9002/11-120-024-001
Explosion Protection	Installation Location (per NEC 500)	Class I, Division 2						
	Ex Interface (for intrinsically safe interface) (per NEC 500)	Class I, II, III Division 1 or 2						
	Agency Approvals	ATEX (PTB), Brazil (ULB), Canada (FM), China (CQST), IECEx (PTB), India (PESO), Japan (CML), Korea (KGS), USA (FM), USA (UL)						
Safety Data*	Max Voltage (V_{oc})	9.3 V	28.0 V	28.0 V	7.9 V	12.0 V	13.0 V	12.0 V
	Max Current (I_{sc})	150mA	107mA	93mA	100mA	12mA	321mA	12mA
	Max Power (P_o)	350mW	749mW	650mW	198mW	40mW	1040mW	40mW
Electrical Data	Number of Channels	2 in / 2 out (or 1 thermocouple in/ out)	2 in / 2 out (or 1 combined in/out)	2 in / 2 out (or 1 combined in/out)	2 in / 2 out (or 1 combined in/out)	2 in / 2 out (or 1 combined in/out)	2 in / 2 out (or 1 combined in/out)	2 in / 2 out (or 1 combined in/out)
	Nominal Voltage (V_{nom})	6.00 V	24.00 V	25.00 V	5.5 V	9.00 V	10.00 VDC	9.00 V
	Min Resistance (R_{min})	71.7 Ω	270Ω	322Ω	84Ω	1051Ω	46Ω	1052Ω
	Max Resistance (R_{max})	81.5 Ω	296Ω	359Ω	95Ω	1164Ω	52Ω	1165Ω
	Output	Equal to input signal						
Ambient Conditions	Operating Temperature	-20°C to 60°C [-4°F to 140°F]						
	Storage Temperature	-20°C to 75°C [-4°F to 167°F]						
Mechanical Data	Degree of Protection	IP20						
	Mounting Type	DIN rail						
	Wire Gauge Range	16AWG for terminals 12AWG for ground connections						

**** These safety data values are for one of two channels.***

Connection Diagram for 9002-77-093-300001



Two-channel safety barriers, star barrier / star barrier

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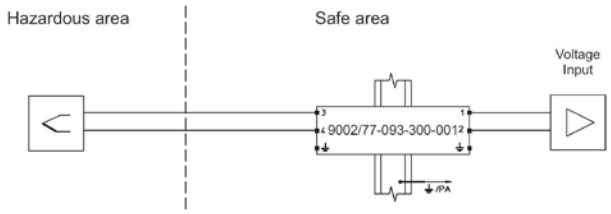
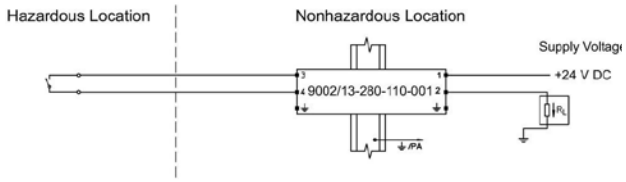
Application-Specific Diagrams



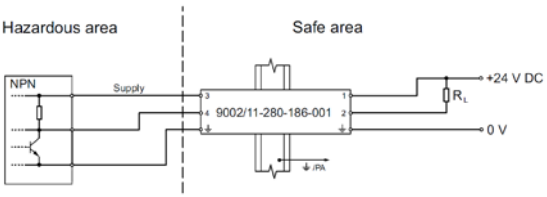
Application: Thermocouples

9002-77-093-300001



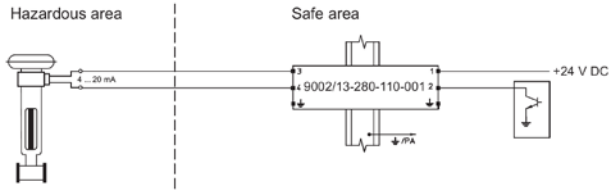
Application: Use of potential-free contacts

9002/13-280-110-001



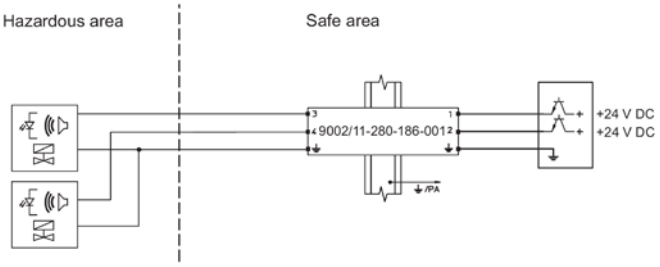
Application: 3-wire NPN inputs (negative switching) of proximity switches, photocells and encoders

9002/11-280-186-001



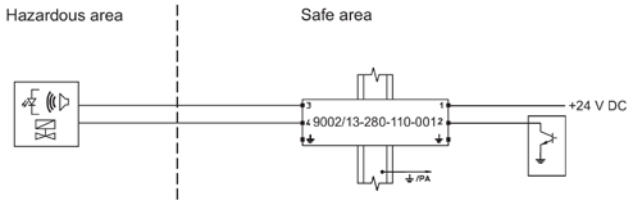
Application: 2-wire 4 to 20 mA I/P converters and control valves – standard and HART, 4 to 20 mA indicators

9002/13-280-110-001



Application: Discrete 2-wire output for solenoid valves, LEDs and signalling devices

9002/11-280-186-001



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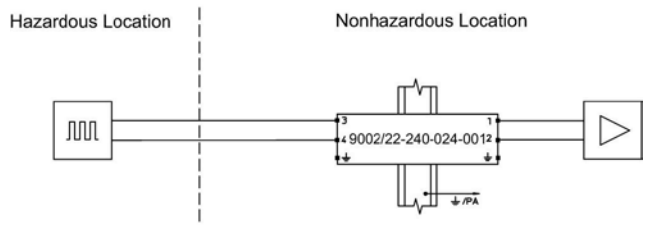
9002/13-280-110-001



Application: Voltage pulse inputs

9002/22-240-024-001 or 9002/22-158-200-001

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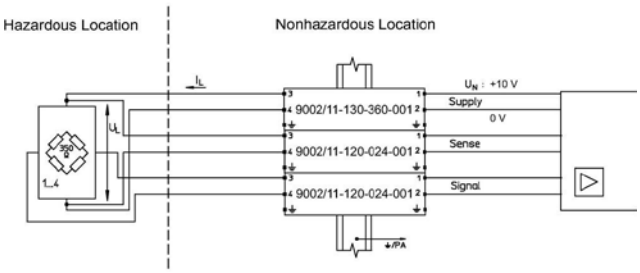
Application-Specific Diagrams, continued



9002/11-130-360-001 with two 9002/11-120-024-001

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Operating Data			
Operating Voltage	V_{nom} = 10V		
Maximum Resistance of the Zener Barrier	R_{max} = 2 x 52Ω = 104Ω		
Number of Load Cells Connected in Parallel	350Ω		
	R_{sum} (Ω)	V_L (V)	I_L (mA)
1	454.0	7.7	22.0
2	279.0	6.3	35.8
3	220.7	5.3	45.3
4	191.5	4.6	52.2
Safety Data			
Maximum Voltage	V_{oc} / U_o = max (13V; 12V; 12V) = 13V		
Maximum Current	I_{sc} / I_o = 360ma+24mA+24mA = 408mA		
Maximum Power	P_o = 1070mW+70mW+70mW = 1210mW		
According to EN 60079-11			
Maximum Permissible External Inductance	L_a / L_o	A, B, E or IIC 0.18 mH	C, D, F, G or IIB 1.45 mH
Maximum Permissible External Capacitance	C_a / C_o	A, B, E or IIC 0.270 µF	C, D, F, G or IIB 1.64 µF

Application Note

For 4-wire circuits (without sense) there is no need for the corresponding zener barrier. The operating data remains unchanged. The safety-relevant maximum current is reduced to I_{sc} / I_o = 384mA, and the maximum power to Po=1330mW.

Safety Products

Warning: Safety products sold by AutomationDirect are Safety components only. The purchaser/installer is solely responsible for the application of these components and ensuring all necessary steps have been taken to assure each application and use meets all performance and applicable safety requirements and/or local, national and/or international safety codes as required by the application. AutomationDirect cannot certify that our products, used solely or in conjunction with other AutomationDirect or other vendors' products, will assure safety for any application. Any person using or applying any products sold by AutomationDirect is responsible for learning the safety requirements for their individual application and applying them, and therefore assumes all risks, and accepts full and complete responsibility, for the selection and suitability of the product for their respective application.

AutomationDirect does not provide design or consulting services, and cannot advise whether any specific application or use of our products would ensure compliance with the safety requirements for any application.