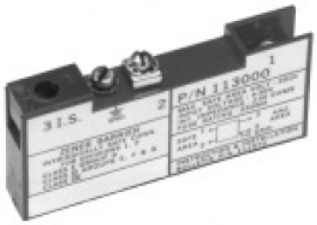
SBG111950A, SBG111954A
SBG111956A, SBG113000A, SBG114166A
Single Channel Zener Barrier

Instruction Sheet *M1779/0515*



INSTRUCTION SHEET

DESCRIPTION

These shunt diode, safety barriers are one channel devices which pass a unidirectional signal (D.C.) and limit the energy to a level that cannot ignite an explosive atmosphere.

Approvals: UL and CSA.

UNPACKING

Remove the Packing List and verify that you have received all equipment. If you have any questions about the shipment, please call the OMEGA Customer Service Department at 1-800-622-2378 or (203) 359-1660. When you receive the shipment, inspect the container and equipment for any signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE

The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packaging material and carton in the event reshipment is necessary.

Important: Read carefully and completely before installing or connecting the solid-state relays.

INSTALLATION REQUIREMENTS

Location: Barriers must be installed and grouped in a non-hazardous location. If necessary to locate in a hazardous area, barriers must be mounted in a suitable enclosure which, along with its installation, must be suitable for that location.

Environment: The operating temperature range for these barriers is -40°F to +140°F (-40°C to +60°C). They should be mounted in a clean, dry environment and be well ventilated, so that the maximum temperature is not exceeded. If an enclosure is used, it must be suitable for the location.

Earth Connection: The bracket on which the barrier is mounted must be connected to an earth ground. Grounding should be adequate for conduction of line-generated fault currents and should have a resistance of less than one ohm. (See Figures 1 and 2.)

Safe Area Apparatus: Safe area apparatus must not generate or be connected to sources having voltages greater than 250Vrms or VDC.

WARNING

Product must be maintained and installed in strict accordance with the National Electrical Code. Failure to observe this warning could

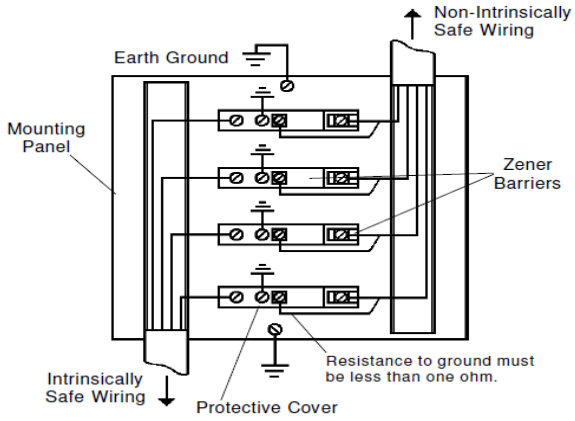
INSTALLATION

It is expected that the installation will be in accordance with ISA RP-12.6, NEC Chapters 5 and 7. Approval. The following specific points should be kept in mind:

- Check that the barrier is of specified type and polarity.
- For multiple barrier installation, the barrier's safe area sides should face one side of the enclosure and the intrinsically safe sides should face the opposite side (see Fig. 1). Wiring must be channeled and segregated as shown, so that no mis-wiring can occur during servicing, testing or when replaced.
- Connect hazardous area equipment to terminals marked '3' and '2' (Fig. 3). Common, commercially available signal wire may be used provided its capacitance and inductance are below the following maximum values:

- TABLE 1 -

Model Number	Rated Voltage	Group	Parallel Capac - uF	Series Induct - mH
SBG111950A	+15	A, B, C, D, E, G	0.32	2.0
SBG111954A	+24	A, B, C, D, E, G	0.12	3.0
SBG111956A	+30	A, B, C, D, E, G	0.07	1.8
SBG113000A	+30	C, D, E, G	0.2	3.0
Signal Return Barriers				
SBG114166A	+30	A, B, C, D, E, G	0.07	0.35



Important

1. All barriers used for multiple barrier mounting must be of the same polarity.
2. All intrinsically safe wiring must be segregated from non-intrinsically safe wiring and shall have a minimum insulation thickness of 0.010".

Fig. 1. Multiple Barrier Mounting

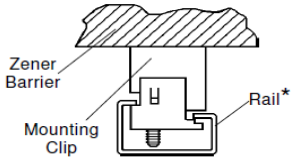


Fig. 2. Optional Mounting Clip (SBG113530)

Note: Positive signal channel shown. Sensor switch may be any non-voltage producing, essentially resistive device; containing no energy storing components. Flow and level switches, temperature switches, pressure switches or resistive transducers or transmitters are typical devices.

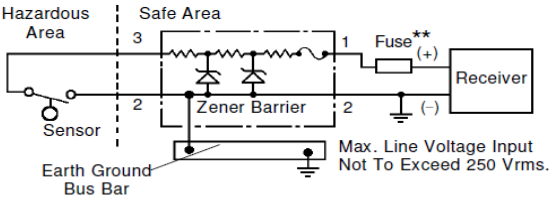
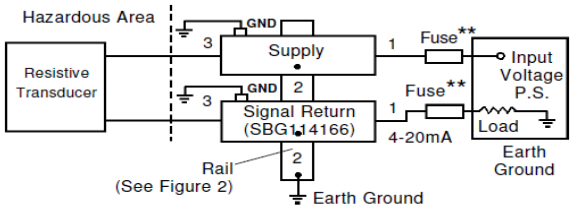


Fig. 3. Positive Signal Barrier Installation



**Littelfuse type 3AG or equal (optional). External fuses are recommended to protect barrier from incorrect wiring or equipment faults at start-up.

Note: Redundant grounding required by CSA.

Fig. 4.
Supply and Signal Return Barrier Type Installation
(4-20mA Transducer with Both Leads Floating and Neg.Signal Common)

- Safety depends on earth continuity. The resistance to earth ground must be less than 1 ohm.

INSPECTION

A routine inspection should be made at intervals of not more than two years. Harsh locations should be inspected more frequently to:

1. Check integrity of earth grounding (Less than one ohm).
2. Check unit labeling for legibility.
3. Check all interconnections for good electrical connections.

> **Caution**
> Never conduct tests while circuit is active. Use of instruments between input and output will bypass barrier.

TESTING

- All testing is to be done with circuit inactive and all but earth grounding disconnected.
- With a suitable ohmmeter (resolution to 1 ohm), measure the resistance between terminals 1 and 3. The total resistance read-ings shown in **Table 2** indicate a good unit.

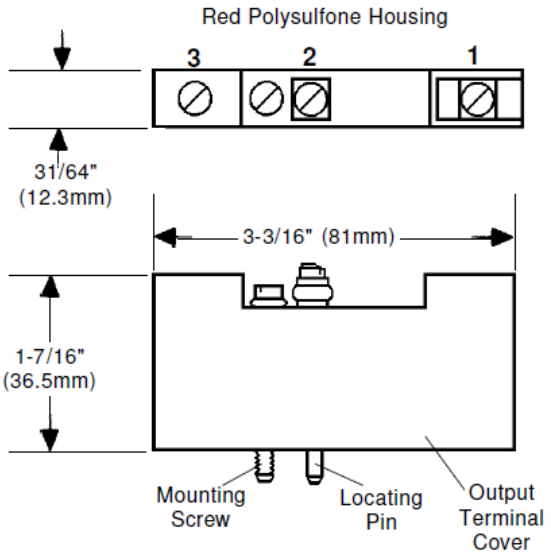


Fig. 5. Dimensions

- TABLE 2 -

Model Number	Rated Voltage	Total* Resist. Ohms	Limit* Resist. Ohms	Fuse Rating mA	Max. Voc	ISC mA
SBG111950A	+15	183	153	250	17.3	112.8
SBG111954A	+24	390	360	62	26.2	72.7
SBG111956A	+30	750	720	62	33.1	46.0
SBG113000A	+30	303	273	250	36.1	132.3
Signal Return Barriers						
SBG114166A	+30	33.9	30	250	36.1	0

***All resistance values are ±5%**

- TABLE 2 -
(Specifications)

Model Number	DC Input to Barrier, Max.		Signal Polarity	Series Resist. Ω	Applications Groups Class I & II, Div 1, 2	Reactive Limits		Ambient Operating Temperature	Weight
	Voltage	Fuse Rating Current, mA				Capacitance µF	Inductance mH		
SBG111950A	+15	250	Positive	183	Groups A, B, C, D, E, F, G	0.32	2.0	-40° to +140° F (-40° to +60° C)	66g
SBG111954A	+24	62	Positive	390		0.12	4.9		66g
SBG111956A	+30	62	Positive	750		0.07	11.1		66g
SBG113000A	+30	250	Positive	303	Groups C, D, E, F, G	0.20	3.0		66g
Signal Return Barrier									
SBG114166A	+30	250	Positive	33.9	Groups A, B, C, D, E, F, G	0.07	0.35	-40° to +140° F (-40° to +60° C)	66g

Housing material is polysulfone.

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WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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