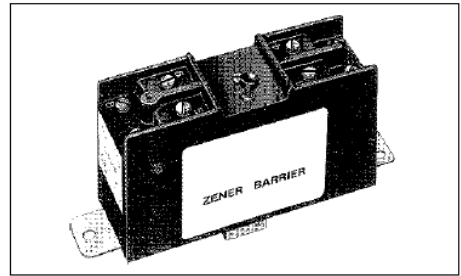




SBG54806A
Dual Channel Zener Barrier
 Instruction Sheet M1777/0515



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DESCRIPTION

The OMEGA® SBG54806A Zener Barrier is a solid-state, energy limiting device for transmitting direct current signals of less than 30V and less than 60mA in an intrinsically safe manner. The unit is designed to be used in conjunction with indicating equipment in hazardous areas defined as Class I, Division 1, Group D. This zener barrier is used where circuit common is earth-ground referenced.

THE AMBIENT TEMPERATURE OPERATING RANGE OF THIS DEVICE IS 0° TO 60° C. (+32° TO +140° F).

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.

CONSIDERATIONS FOR INSTALLATION AND USE

- Only one sensor per channel may be connected to a barrier (See Figure 1).
- The barrier and receiving station must be located in a non-hazardous location.
- The mounting bracket on the barrier must be connected to an earth ground from both mounting points and two lines for redundancy. The grounding should be adequate for conduction of line generated fault currents. The resistance of either line to earth ground should be maintained at less than one ohm.
- To serve multiple tank installations, additional barriers may be placed in an enclosure using a common earth ground (See Figure 3). In this enclosure, the intrinsically safe wiring should be segregated from non-intrinsically safe wiring by independent raceways, wiring trays or other adequate means to insure the integrity of the installation. Additionally, when internal terminations are used, intrinsically safe wiring and non-intrinsically safe wiring should not be adjacent or arranged in such a way as to create the potential to miswire or bypass the barrier during servicing or testing. (See typical installation depicted in Figure 1.)
- Common, commercially available signal wire may be used for field wiring and distances of up to 1000 ft. are acceptable using twisted wire. Characteristics of the signal line should not be modified by addition of capacitive or inductive components.
- Each sensor must have its own ground return wire to pin 5.

WARNING
 Product must be maintained and installed in strict accordance with the National Electrical Code. Failure to observe this warning could result in serious injuries or damages.

The governing parameters for various groups are as follows:

	GROUP	CAPACITANCE	INDUCTANCE
Methane	D	2.0 µF	6.0 mH

Note: *Values are for any one loop in the hazardous area. (i.e., Terminals 7 to 5 or 8 to 5)

- **Field Testing of Barrier**
 A. Never conduct tests while circuit is active. The use of instruments between input and output terminals will bypass the barrier.

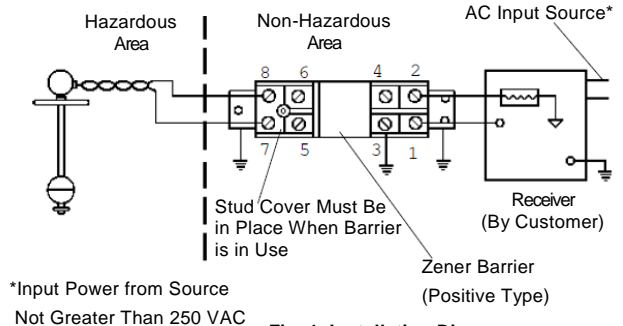


Fig. 1. Installation Diagram

Important
 All barriers used for multiple barrier mounting must be of the same polarity.

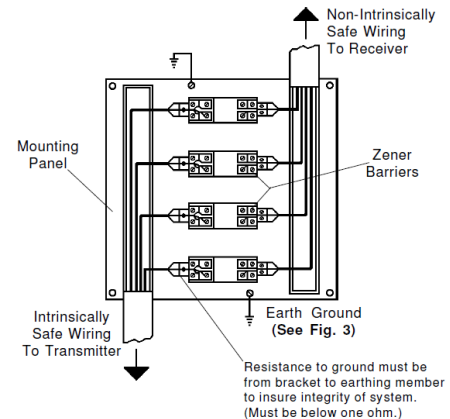
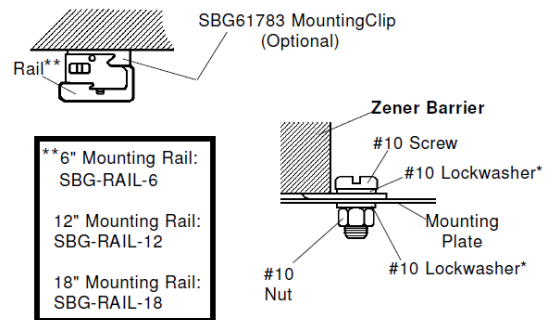
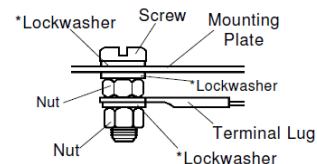


Fig. 2. Multiple Barrier Mounting



Detail of Earth Grounding



Notes

1. Grounding Hardware to be #8 or larger and stainless steel
2. *(Lockwashers to be internal or external tooth type)

Fig. 3. Details of Mounting and Grounding

B. All testing is to be done with circuit inactive using the following instruments:

1. Ohmmeter with resolution down to less than 1 ohm.
2. D. C. power supply with an output of 0 to +40 VDC.
3. D. C. voltmeter.

C. Test performance (See Fig. 5)

Step 1:

Disconnect all leads to unit under test except to the earth grounding mounting tabs.

Step 2:

- a. Measure the resistance between terminals 1 & 7 and then 2 & 8. This resistance should be 250 ohms $\pm 5\%$ (\pm instrument tolerance).
- b. Measure the resistance between terminals 5 & 3 and then terminal 5 and the mounting tab. Both readings should be below one ohm.
- c. Apply 35 volts to terminals 7(+) and 5 (common). Then read the voltage between the terminals 1 (+) and 3 (common)*. This voltage must be between 28 and 32 volts. In the same fashion, conduct this same test with the voltage connected across 8 (+) and 5 (common) and measure the output across 2 (+) and 3 (common).
- d. Connect an ohmmeter between the mounting tab (not the mounting screw) and the earth ground reference. The reading must be less than one ohm. **The barrier must pass all parts of this test or it is unacceptable.**

* The fuses located in the circuits 7-1 and 8-2 are rated at 60mA. Therefore, care should be exercised in testing this device so that no accidental current greater than 60mA enters or leaves terminal 1 or 2.

Note: Every effort should be made to keep these barriers clean and free of contaminating atmospheres. A periodic check should be made to verify that they are in good condition, physically and electrically.

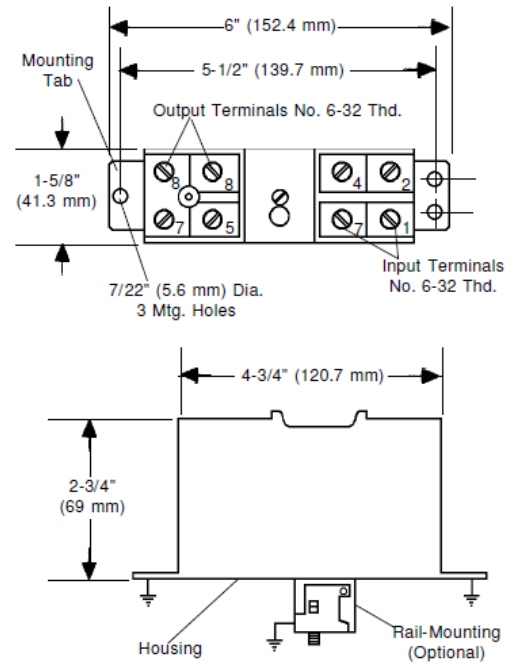


Fig. 4. Dimensions

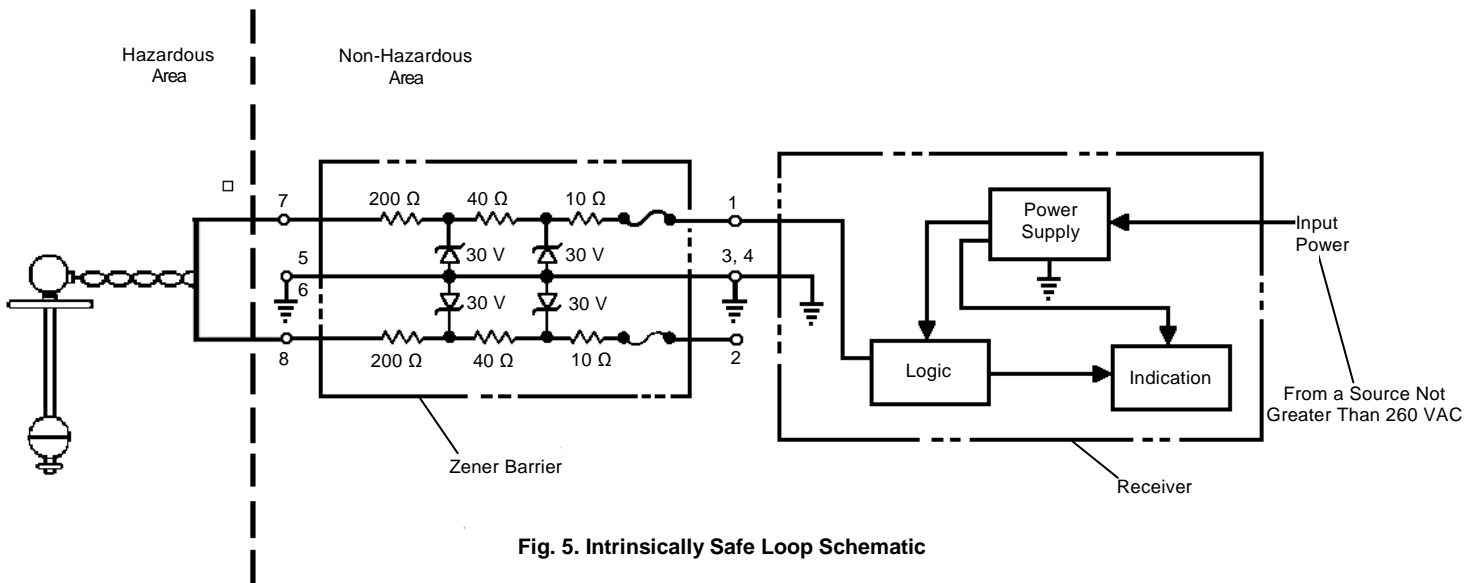


Fig. 5. Intrinsically Safe Loop Schematic

Table 1. Specifications

Model Number	DC Input to Barrier, Max.		Signal Polarity	Series Resist. Ω	Applications Groups Class I & II, Div 1, 2	Reactive Limits		Ambient Oper. Temp.	Weight
	Voltage	Fuse Rating Current, mA				Capacitance μF	Inductance mH		
SBG54806A	30	60	Positive	270	Group D	2.0	6.0	(32° to +140°F)	495g

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WARNING: These products are not designed for use in, and should not be used for, human applications.

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.

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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.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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