



SBG144600

Intrinsic Safety Relay

Instruction Sheet M-2474/1096



DESCRIPTION

The OMEGA® SBG144600 Solid-State Relays are used as "intrinsically safe switching circuits in hazardous locations, with non-voltage-producing sensors". When installed in accordance with this manual, these field sensors are suitable for Classes I and 2, Divisions 1 and 2, Groups A, B, C, D, E, F, and G, as defined by the National Electrical Code Handbook.

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 intrinsic safety relay.

Associated Equipment

Caution: The intrinsically safe relays must be mounted outside the hazardous location. Only the sensor's terminals provide an intrinsically safe switch circuit (Fig. 1). (Exia) means associated equipment "Appareillage connexe", located in safe area.

● Mounting and Enclosure Consideration

Field wiring of intrinsically safe circuits is to be segregated from non-intrinsically safe wiring by use of suitable barriers, separate wireways or trays (see Fig. 2). Wire insulation to be .010", minimum.

- Intrinsically safe and non-intrinsically safe connection points should be located sufficiently apart to prevent any possibility of bypassing or miswiring during installation or servicing of equipment.

- The enclosure shall contain a cautionary statement as follows:

"CAUTION: ANY SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY".

- The mounting plate must be grounded to ensure intrinsic safety. Resistance between the plate and earth ground should be less than one ohm. (See Figs. 3 and 4 for recommended selection of grounding hardware and refer to Article 250 of the National Electrical Code for methods and practices.)

Installation of Sensor Switch and Associated Field Wiring

- The nature of the sensor switch must be that it is a non-voltage-producing, essentially resistive termination or other device specifically examined and approved for use with the intrinsically safe solid-state relay.
- The conductors of the intrinsically safe circuit should be sealed in a rigid metal conduit at the point where the wiring enters the hazardous area. The wiring and sensor switch should be such that conductive dusts in the hazardous area will not close the circuit.
- Hazardous area field wiring will store energy due to distributed capacitance and inductance in proportion to its length. It is therefore recommended that the characteristics of the cable be known and judged against the length of run and atmosphere of exposure.

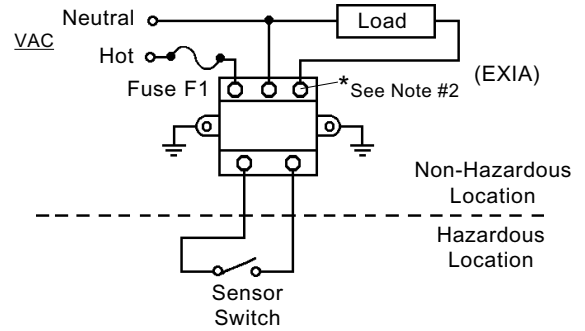
- The following chart is presented as a guideline in determining the limits of reactance for signal loops in the hazardous area wiring for the intrinsically safe solid-state relays.

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.

GROUP	CAPACITANCE	INDUCTANCE
A & B	0.6 μ F	1.3 mH
C & E	1.9 μ F	5.4 mH
D, F, G	1.9 μ F	10 mH

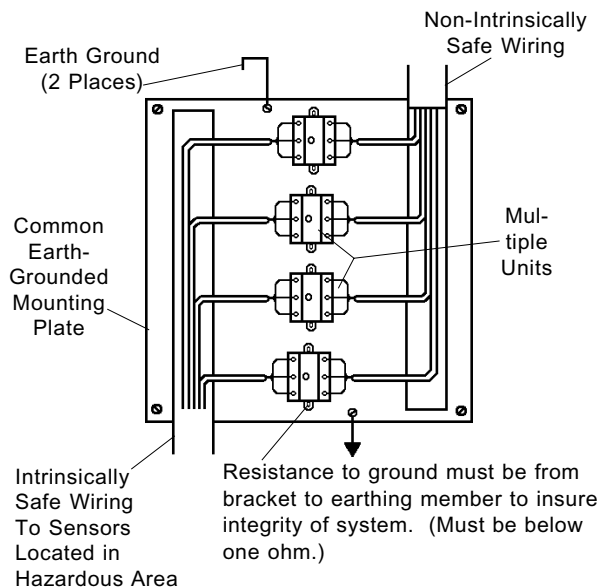
Example: Typical values of capacitance for a twisted pair of copper wires is between 20 and 60 pF per foot. Using the maximum value of 60pF/ft, Groups A & B could have a run of 1500+ feet with safety. Inductance of a typical twisted pair is between 0.10 and 0.20 μ H/ft, thus making a cable run in this example essentially determined by the capacitance.



Notes

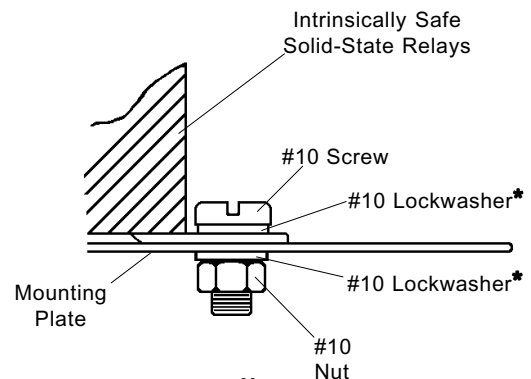
1. For 120V application, only one fuse is required in the ungrounded circuit of the input line.
2. Required torque on these terminals not to exceed 10 lb-inches on stranded wire - 8 lb-inches on solid wire.

Fig. 1. Connection Diagram



Note: All intrinsically safe wiring must be segregated from non-intrinsically safe wiring and shall have a minimum insulation thickness of .010".

Fig. 2. Multiple units (located in a non-hazardous area) grouped on a common, earth-grounded mounting plate.



Notes

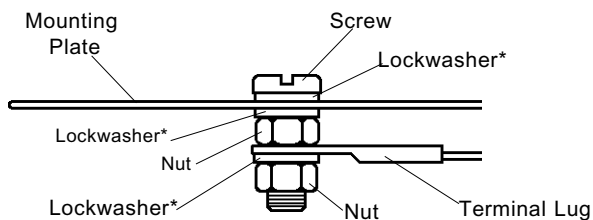
1. Grounding Hardware to be #8 or larger and stainless steel
2. *Lockwashers to be internal or external tooth-type

Fig. 3. Unit Mounting Detail

Installation of Sensor Switch and Associated Field Wiring (Cont.)

- Whenever possible, the actual measured parameters should be used in making the determination of allowable length.
- Shielded cable is not required, but if used in the application, the shield must be returned to ground, the same point at mounting tab.
- Non-intrinsically safe wiring cannot be run in conduit or open raceways together with intrinsically safe wiring. (See **Note - next page.)
- Fusing of the solid-state relays to be in accordance with Fig. 1. Fuse F1 to be 6 amps slo-blo, 120 VAC for 120V line voltage; 250 VAC for 240 V application.

****Note:** All intrinsically safe wiring to intrinsically safe solid-state relays must be segregated from non-intrinsically safe wiring.



Notes:

1. *(Lockwasher to be internal or external tooth type)
2. Grounding hardware to be #8 or larger and S.S.

Fig. 4. Mounting Plate Grounding Detail

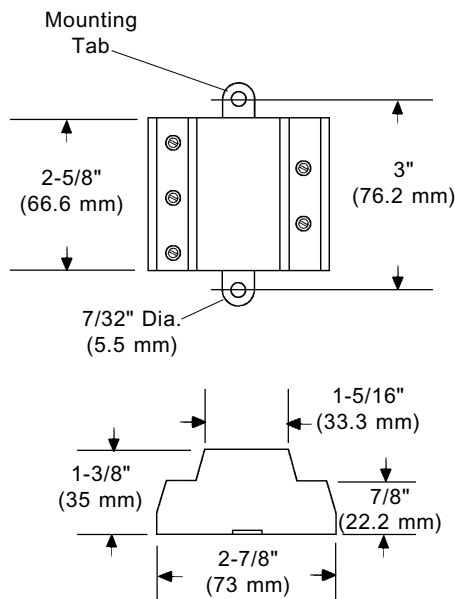


Fig. 5. Dimensions

Table 1. Specifications

Model Number	Description	Line & Load Voltage Range	Load Current Max	Turn-On Sensitivity (Typical)	Turn-Off Sensitivity (Typical)	Voltage Loss	Operating Temperature Range	Output Leakage Current Max.	Switching Operation	Weight
SBG144600	SSR for Intrinsic Safety	105 to 125 VAC	5A	≤ 500 Ω	2000 Ω	2 VAC	-40°F to 120°F (-40°C to +48.9°C)	6mA @ 120 VAC	SPST N.O.	198g



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MADE
IN USA

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 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 should malfunction, 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 being 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 which wear are not warranted, including but 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 it 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. P.O. 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. P.O. number to cover the COST of the repair,
2. Model and serial number of 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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WARNING: These products are not designed for use in, and should not be used for, patient connected applications.