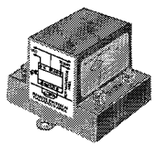
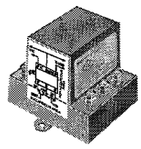
SBG22445, SBG25872, SBG25873 (Non-Latching), SBG41705 (Latching) Solid-State Relays for Intrinsic Safety Use

Instruction Sheet M1773/0794



Non-Latching Solid-State Relay



Latching Solid-State Relay

DESCRIPTION

The OMEGA® SBG22445, SBG25872, SBG25873 and SBG41705 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 Class I, Division 1, 2, Groups A, B, C and D, and Class II, Division 2, Groups E, F and G as defined by Article 500 of the National Electric Code.

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.

ASSOCIATED EQUIPMENT

Caution: The intrinsically safe relays can be installed in panel assemblies in Class I, Div.2, Groups A, B, C and D or in a non-hazardous location. Only the sensor's terminals provide an intrinsically safe switch circuit (Fig. 1, 2). (Exia) means associated equipment "Appareilage 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. 3).
- 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. 4 and 5 for recommended selection of grounding hardware and refer to Article 250 of the National Electrical Code for methods and practice.)

INSTALLATION OF SENSOR SWITCH AND ASSOCIATED FIELD WIRING

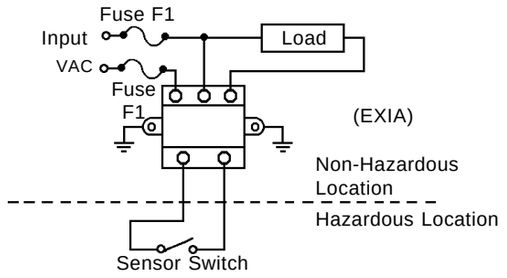
- The nature of the sensor switch must be that it is a non-voltage-producing, essentially resistive termination or other device specifically examined and approved for use with the intrinsically safe solid-state relay.
- The conductors of the intrinsically safe circuit should be sealed in a rigid metal 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	0.1 µF	3 mH
C	0.2 µF	10mH
D	0.3 µF	20mH

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 µH/ft, thus making a cable run in this example essentially determined by the capacitance.

- 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.



Note: For 120V application, only one fuse is required in the ungrounded circuit of the input line.

Fig. 1. Connection Diagram (All Models Except SBG41705)

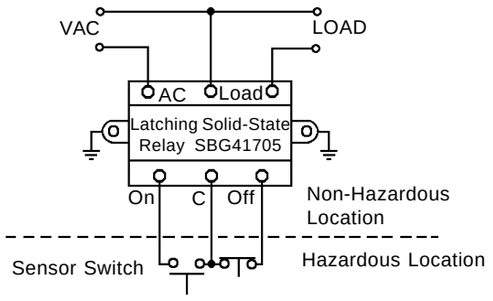
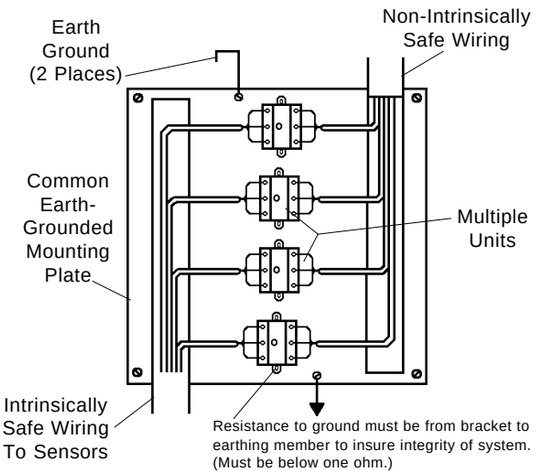
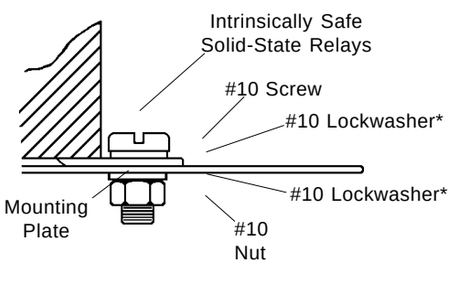


Fig. 2. Connection Diagram: Model SBG41705



Note: All intrinsically safe wiring must be segregated from non-intrinsically safe wiring.

Fig. 3. Multiple units grouped on a common, earth-grounded mounting plate.

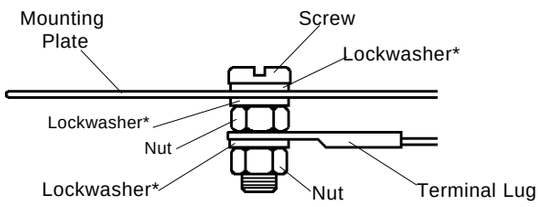


*(Lockwashers to be internal or external tooth type)

Fig. 4. Unit Mounting Detail

- Non-intrinsically safe wiring cannot be run in conduit or open raceways together with intrinsically safe wiring.**
- Refer to Fig 6 for detailed connection to terminal studs. All hardware, including terminal lugs, is supplied with unit.
- 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 hardwre to be #8 or larger and S.S.

Fig. 5. Mounting Plate Grounding Detail

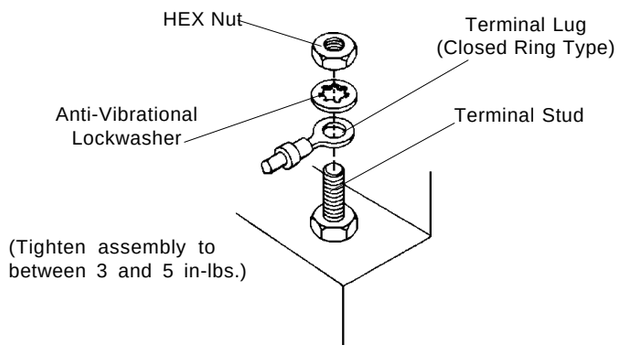


Fig. 6
Recommended method of connection to electrical terminals. All terminal hardware, including lug, supplied with unit.

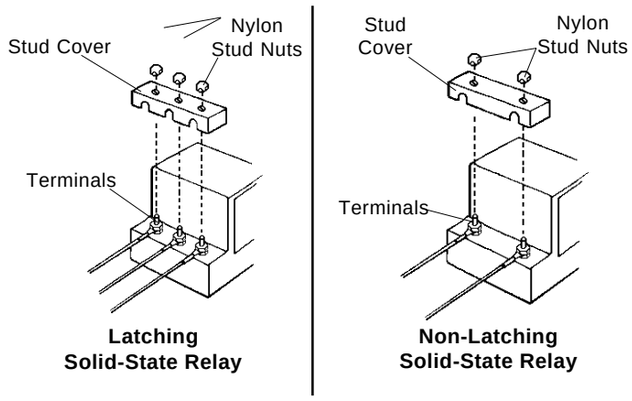


Fig. 7. Mounting of protective cover over sensor-connected terminals of unit.

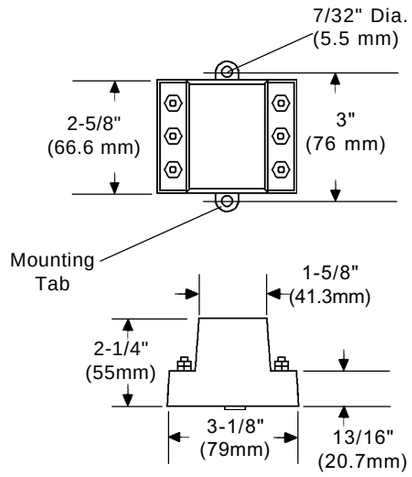


Fig. 8. Dimensions

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
SBG22445 SBG25872	SSR for Intrinsic Safety	95 to 135 VAC	5A	≤ 400 KΩ	1 meg. Ω	2 VAC	0° to +120°F	6mA @ 120 VAC	SPST N.O. SPST N.C.	425g
SBG25873		200 to 250 VAC						12 mA @ 250 VAC	SPST N.O.	
SBG41705	Latching SSR for Intrinsic Safety	105 to 125 VAC	0.3 A Steady State	≤ 25 KΩ	1 meg. Ω	2 VAC	+32° to +120°F	3 mA @ 120 VAC	SPST N.O.	425g

All AC voltage and current specifications are RMS values unless otherwise stated. Housing material is Polysulfone.

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Customer Service: 1-800-622-2378 / 1-800-622-BEST℠
Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN℠
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WARRANTY

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. Call toll free in the USA and Canada: 1-800-622-2378, FAX: 203-359-7811; International: 203-359-1660, FAX: 203-359-7807.

BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, YOU MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OUR 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.

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 you are having with the product.

FOR **NON-WARRANTY** REPAIRS OR **CALIBRATION**, consult OMEGA for current repair/calibration charges. Have the following information available BEFORE contacting OMEGA:
1. P.O. number to cover the COST of the repair/calibration,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems you are having with 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.

P/N 158350