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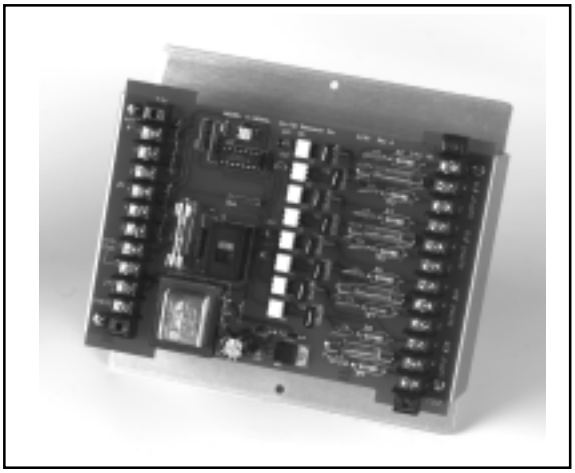
DA-TEL RESEARCH COMPANY, INC. • 932 N. PARK AVENUE • P. O. BOX 1206
MONTROSE, COLORADO 81402 • PHONE (970) 249-6129 • FAX (970) 249-8919
www.da-telresearch.com • EMAIL: info@da-telresearch.com

G-9694 A
SOLID STATE AC ISOLATION RELAYS
INSTRUCTION INFORMATION

GENERAL DESCRIPTION

The Solid-State AC Contact Multiplier, model G-9694A, is a two KYZ input, two outputs per input pulse, contact multiplier. The unit is powered from 120/220/277Vac and has red and green LED indicators per input to show contact activity. The G-9694A is designed with the kWh and kVar installation in mind, with one input for each. The inputs may be driven from the same KYZ pulse and form a one input, 4 output multiplier. The unit comes either mounted in a NEMA-rated enclosure or panel-board mounted with a clear cover.

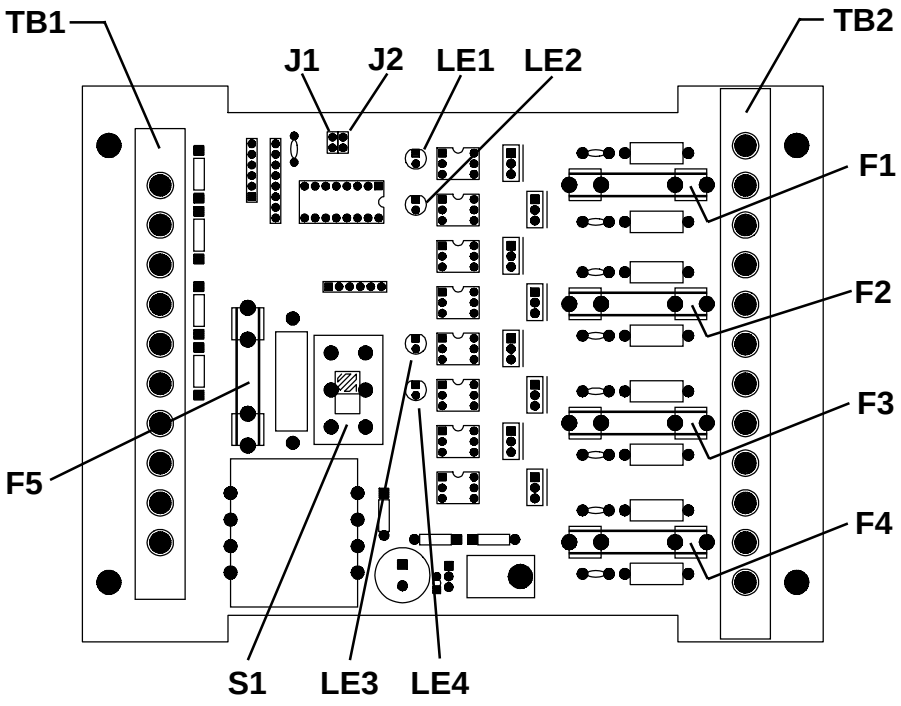


INSTALLATION

Power Connections:

For 115/230Vac installations the line is connected to terminal 7 of TB1 and is labeled "L". S1 must be placed in the appropriate position 115Vac or 230Vac for the system voltage. The neutral is then connected to terminal 8 of TB1 and is labeled "N." For 277Vac system voltages, the line side of the power is moved to terminal 9 of TB1 and is labeled "277V". S1 must be on the 230Vac setting for proper operation. The chassis connection at terminal 10 of TB1 labeled "CHASSIS" is for the contact in protection circuitry and must be taken to a good ground. The 1/8 Amp fuse, F5, is the power input protection fuse.

Simplified layout of the G-9694A



Contact Input Connections:

The K-lead of the KYZ contact input is powered by the internal supply of the G-9694A and has a +15Vdc level. If the contact initiator device is polarity sensitive, pay particular attention to this polarity. If the contact initiator is a Form-C device having both a "Y" and a "Z" leg, connect them in the proper position for each input as shown in Table 1. For Form-C inputs, J1 and J2 should be open. If the input devices are only Form-A, the positive side will connect to the K-lead and the remaining side to the Y inputs. J1 and J2 must then be installed. Note that J1 is for Input #1 and J2 is for Input #2. This clearly indicates that each input is separate and that one could be a Form-A input and the other a Form-C input. Once the connections have been made activity on the inputs can be seen by LED activity, LE1 and LE2 for Input #1 and LE3 and LE4 for Input #2.

Contact Output Connections:

The output triacs for each input are protected by way of a 1A fuse in the K-lead of each set. The drive for the devices is shown in Figure 1 with the proper connections made according to Table 1. Note that the triacs are rated for 4 Amps; however, the 1 Amp fuse gives plenty of safety margin for voltage levels up to 130Vac.

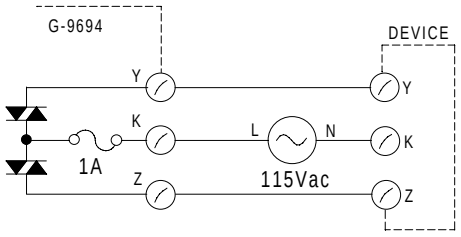


FIGURE 1

TABLE 1

INPUT	K	Y	Z	LED#
#1	TB1-2	TB1-1	TB1-3	LE1
				LE2
#2	TB1-5	TB1-4	TB1-6	LE3
				LE4

OUTPUT	K	Y	Z	FUSE
#1	TB2-2	TB2-1	TB2-3	F1
#2	TB2-5	TB2-4	TB2-6	F2
#3	TB2-8	TB2-7	TB2-9	F3
#4	TB2-11	TB2-10	TB2-12	F4

THEORY OF OPERATION:

Form-C inputs into the Solid-State AC Contact Multiplier drive the triac-pairs in opposing directions when either input contact is closed. When K-Y is closed, the inverter drives U1 and U3 on (low). Through the opto-couplers U1 and U3, gate voltage is applied to TY1 and TY3 to apply ac voltage from K to the respective Y outputs. When the K-Z input is shorted, the inverter drives U2 and U4 on (low). The opto-couplers apply a gate voltage that turns on TY2 and TY4 to apply ac voltage from K to the respective Z outputs. This Form-C mode is with J1 and J2 open.

In Form-A mode (J1 and J2 installed), when K-Y is open, U2 and U4 are driven on (low) by the inverter through the jumpers J1 and J2. When K-Y is shorted, U2 and U4 are driven off (high) by the inverter through the jumpers and U1 and U3 are driven on (low).

TESTING AND CALIBRATION:

To properly test the Solid-State AC Contact Multiplier, model G-9694A, apply each system voltage and measure pin 1 of VR1. This voltage should be greater than 18Vdc but less than 22 Vdc.

With a system voltage of 115Vac connect a Form-C contact across each input. Check to see that LE1 through LE4 are changing from green to red at the contact rate. Check the output of each triac pair by switching 120Vac into either an LED or lamp. A slow rate will facilitate this method. For Form-C inputs ensure that J1 and J2 are open. Use a N.O. contact across the K-Y inputs, install J1 and J2 and ensure that the LEDs are changing and the relays moving.

SPECIFICATIONS:

WEIGHT: 18 oz. without NEMA-rated enclosure or cover.

SIZE: 6.75"L x 7"W x 3""H, minus safety cover

PANEL MOUNTING HOLES:
2 Holes on vertical center spaced 6.25".

TEMPERATURE RANGE: -20° to +70°C.

POWER INPUT:
100-130Vac (115Vac), 200-260Vac (230Vac), and 250-300Vac (277Vac). Burden is less than 2 watts, 50/60Hz.

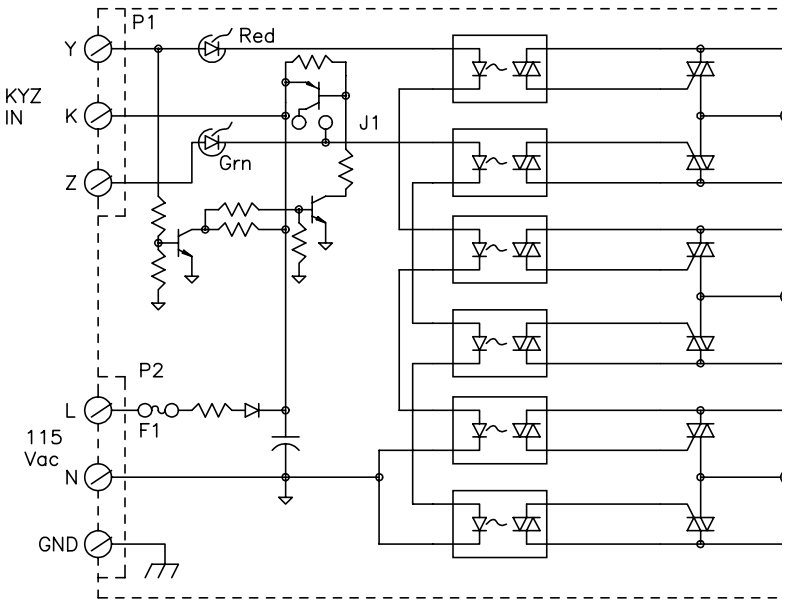
CONTACT INPUTS:
Form-C or Form-A, Maximum Keying Rate is 20 pulses per second. Transient protected above 20Vrms. Wetted from internal 15Vdc source

TRIAC OUTPUTS:
Form-C
Current limited to 1A, Rated 400V, 4A, maximum. Arc suppression applied

INPUT/OUTPUT ISOLATION:
1500Vrms, minimum

OPERATIONAL LIFE EXPECTANCY:
1 Billion operations

SCREW TERMINAL SIZE:
6-32 Screw accommodating up to 0.3" lug for #14 AWG wire.



Simplified Schematic Diagram of the G-9694A