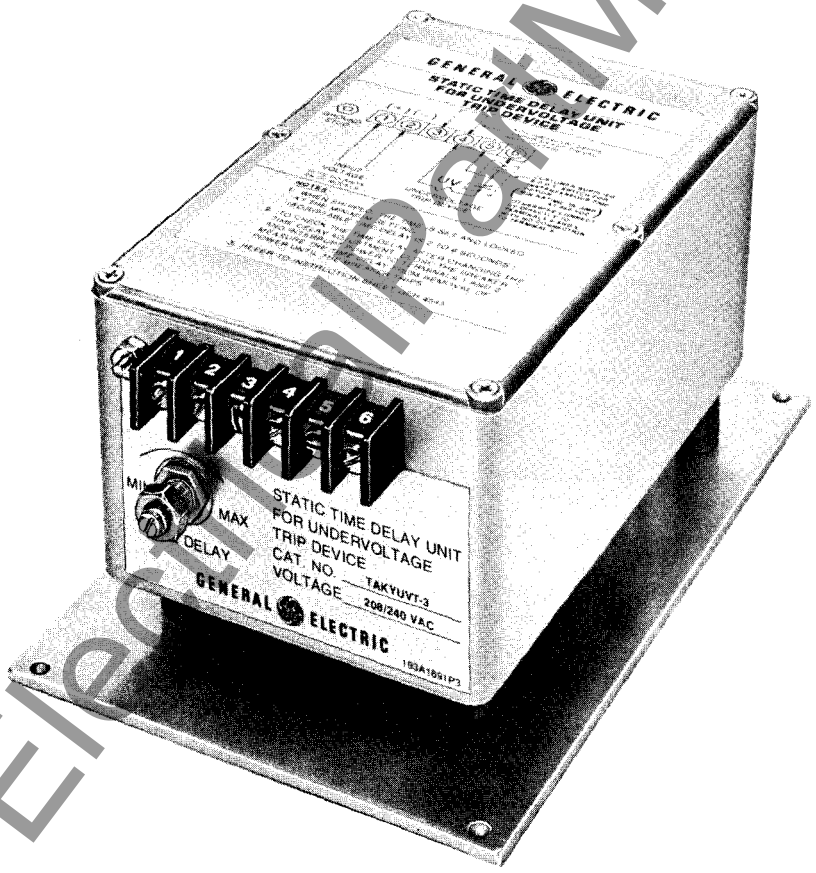
Instructions

GEH-4545-B

Static Time Delay Unit

For Undervoltage Trip Device— AK/AKR Breakers



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The static time delay unit when used in conjunction with a special type AK/AKR undervoltage device acts to "hold in" the UV device during momentary interruption of power. It is designed for continuous duty and has a minimum adjustable time delay range of 2 to 6 seconds at nominal input voltage. See Table 1 for models available.

APPLICATION INFORMATION

1. Input Power Sources

a. 208/240V ac 50/60 Hz sinusoidal.

b. 125 and 250V dc. Must be clean D.C. with a peak-to-peak ripple voltage of not more than 15% of rated voltage.

c. The power source must be capable of supplying a momentary in rush current of 4A at 240VAC/250VDC and 6A at 125VDC. Continuous power requirement approximately 40VA.

2. 208 Vac Operation

The 240V ac static time delay device can be operated at 208V ac by connecting together terminals 3 and 4, Figure 1.

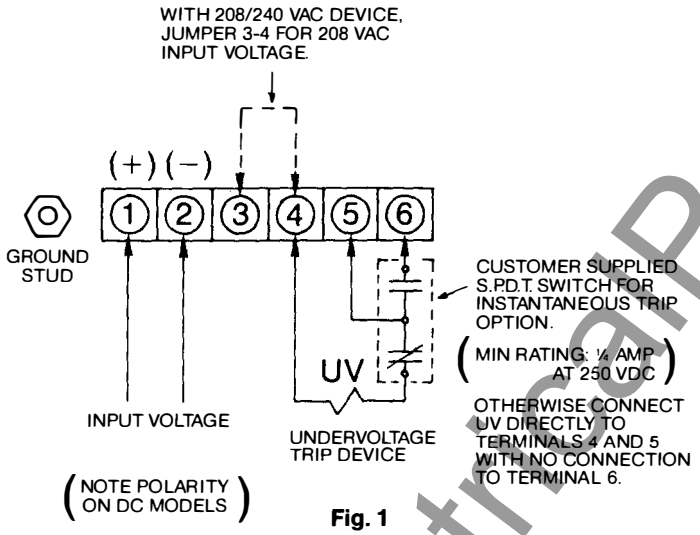


Fig. 1

3. Optional Connection for Instantaneous Trip

In addition to the time delay function, it will be desirable in some applications to also be able to deenergize the UV device instantaneously.

To provide this function (refer to figures 1 and 3), connect a single-pole double-throw switch with its common terminal connected to terminal 5, its normally open contact to terminal 6 and its normally closed contact to the UV device as shown in the schematic diagram (See dash lines).

When the switch is actuated, power to the UV device is interrupted causing it to trip instantaneously. The circuit to Terminal 6 is also closed, thereby providing a discharge path for C3, so when the switch is released, K2 can switch full pull in voltage to the UV device.

4. Time Delay Less Than One Second

The UV device employed with the static time delay unit is adjusted at the factory for minimum drop-out (UV device will "hold in" for the longest time). If a time delay is desired to be less than the 2 second minimum provided by the static time delay unit, this can be accomplished by adjusting the 10-32 brass screw and locknut on the UV device. Adjustment should be counterclockwise so it will act as a stop for the actuator arm, thereby forming an air gap between the armature and pole piece. When the desired minimum time delay is obtained, be certain to lock the screw with the locknut. A sealant applied to the threads would further ensure that the adjustment does not change. Adjustments should be made with the time delay pot on the static unit in the minimum delay position. A reduction in the minimum time delay setting will also decrease the maximum time delay obtainable.

TABLE 1

Static Time Delay Unit For UV Trip Device				Undervoltage Trip Device			
Voltage Rating	Old Catalog Number (For Ref. Only)	New Catalog Number	Replacement P.C. Board For TAKYUVT Devices	Frame and Coil Supersedes 269C28265	Coil Assembly Only	Nominal D.C. Coil Resistance (ohms) @ 25°C	Approximate Steady State D C Operating Voltage
125VDC	177L316G14	TAKYUVT-1	568B460G1	568B309G5	K6275081G61	440	50
250VDC	177L316G15	TAKYUVT-2	568B460G2	568B309G6	K6275081G59	1600	100
208/240VAC	177L316G12	TAKYUVT-3	568B460G3	568B309G24	K6275081G59	1600	110/125

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

INSTALLATION

1. Mount the static time delay box in any position using the four mounting holes provided.
2. Read the application information in Section II.
3. Wire the device as shown in figure 1. Recommended fusing is 0.5A slo-blo. It is also recommended that the static time delay box be grounded. A 6-32 ground stud is provided adjacent to terminal 1.
4. The time delay adjustment is shipped from the factory in the minimum time delay position. To change this adjustment, loosen the locking nut and rotate the control shaft clockwise to increase time delay.

   To measure the time delay, interrupt power to terminals 1 and 2 and measure the time it takes for the breaker to trip. When the desired time delay is obtained, tighten the locking nut on the time delay control.
5. If the static time delay unit has been deenergized for several years, the dielectric film in energy storage capacitor C7 may deform and may cause the control fuse to blow when the unit is reenergized. In this case, the capacitor may be replaced or in some cases the capacitor dielectric film can be reformed by charging the capacitor to rated D.C. voltage through a resistance of 50 ohms per volt (10K for 200VDC capacitor and 22.5K for 450 VDC capacitor) for several minutes.

Dielectric Testing

Short together terminals 1 through 6 and apply 1,500 VAC between these terminals and the enclosure for 1 minute using a nondestructive AC. Hi-pot tester with a maximum output of 20 milliamperes. Do not Hi-pot between terminals or permanent damage to the static time delay device may result.

Miscellaneous

1. Connect only one UV device to each static time delay box.
2. Use only the correct combination of static time delay box and UV device as shown in Figure 3.
3. The UV devices used for time delay applications are special. Do not use them without the static time delay box.

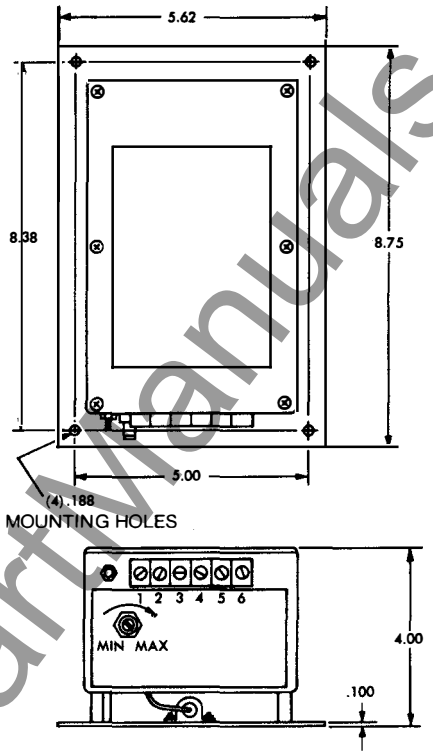
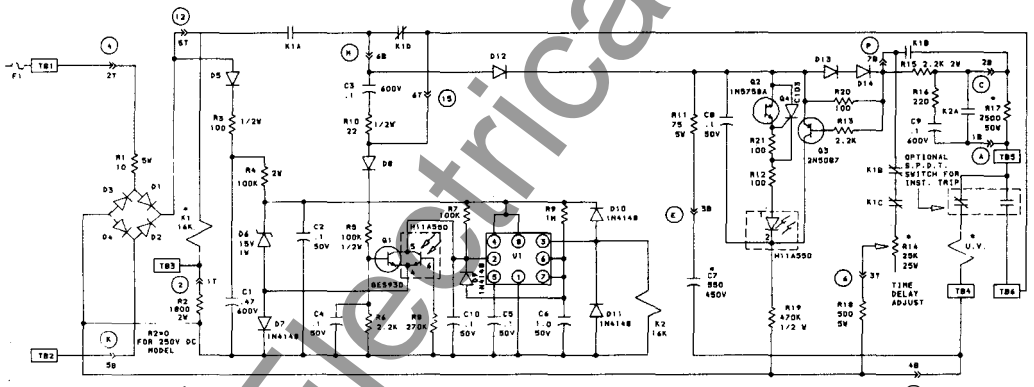
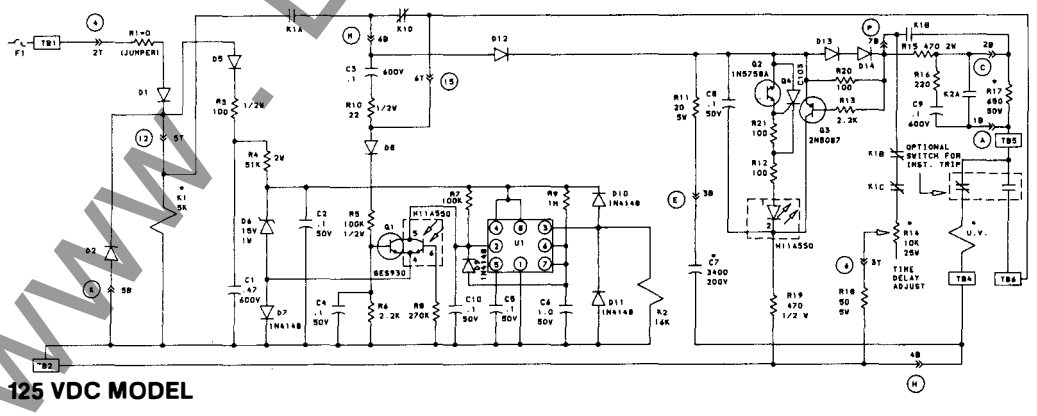


Fig. 2



208/240 VAC AND 250 VDC MODELS (JUMPER TB3 TO TB4 FOR 208 VAC CONNECTION)



125 VDC MODEL

NOTES:

1) ○ = P.C. BOARD CONNECTOR PIN IDENTIFICATION.
2) ★ = COMPONENTS NOT ON P.C. BOARD.
3) RECOMMENDED FUSING IS 0.5 AMP SLO-BLO.
4) CONTACTS SHOWN WITH TB1 & TB2 DE-ENERGIZED
5) ALL DIODES ARE 1N5060'S UNLESS OTHERWISE SPECIFIED.
6) ALL RESISTOR VALUES ARE OHMS AND ¼ WATT UNLESS OTHERWISE SPECIFIED
7) ALL CAPACITOR VALUES ARE MICROFARADS.
8) U1 = INTERSIL 1CM75551PA.
9) K2 = P & B R10SE2Z1J16.OK.

CIRCUIT DESCRIPTION

Refer to the schematic diagrams, figure 3. When power is applied to terminals 1 and 2, a D.C. voltage is applied to relay K1. K1 is adjusted so it will pick up at 80 percent of rated voltage (or less) and will drop out at 30-60 percent of rated voltage. When K1 is energized, all K1 contacts change state. Energy storage capacitor C7 is charged through D12 and R11 and D.C. voltage appears across the UV device and series dropping resistor R17.

Simultaneously transistor Q1 is turned on by charging current through C3, R10, D8, R5 and R6, thereby pulling down terminal 2 of the 555 timer below the trigger level and initiating energization of relay K2 for a duration of approximately one second. Relay K2 closes relay contact K2A, by-passing series dropping resistor R17 and supplying full voltage to the UV device. This voltage is sufficient to "pull in" the UV device. At the end of the one second timing period the 555 timer is automatically reset, opening relay K2 and allowing the series dropping resistor R17 to reduce the UV current to a steady state holding value.

When the voltage to terminals 1 and 2 is interrupted or decreased to a value below the drop out voltage of relay K1, all K1 contacts switch back to their original state. Energy to the UV device is now supplied solely by energy storage capacitor C7 via series resistors R11, R15 and R17. A discharge path is also formed across C7 by R14 and R18 through contacts K1B and K1C. The adjustable setting of R14 determines the primary discharge rate of C7 and/or the time delay setting (length of time that the UV device will be held in by C7). Contact K1D also closes and discharges capacitor C3 through R10 preparing it for the next cycle should the UV device drop out before power is reapplied at approximately 80 percent or more of rated voltage.

Components C8, Q2, Q4, R12 and R21 form a relaxation oscillator used in conjunction with optoisolator H11A55C to activate the 555 timer when the UV device is disconnected and then reconnected as when the breaker is used in draw out construction.

For further information call or write your local General Electric Sales Office or...

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