INSTRUCTIONS

GEK-41852 A
Supersedes GEK-41852
Insert Booklet GEH-1753

TIME OVERCURRENT RELAY

MODEL 12IAC95F(-)A

TYPE IAC

GENERAL ELECTRIC

CONTENTS

TIME OVERCURRENT RELAY

MODEL 12IAC95F(-)A

TYPE IAC

INTRODUCTION

These instructions plus those included in GEH-1753 form the instructions for this relay.

DESCRIPTION

The 12IAC95F(-)A relay is of the same general construction as Type IAC51A described in instructions GEH-1753. Some of the parts, adjustments and specifications have been altered to give shorter operating times. The most obvious of the changes are that the U-magnet is mounted on the opposite side and the spiral cut-out of the disk has been omitted. The former is of little importance but the omission of the cut-out of the disk means that there is no compensation for the windup of the control spring. This means that more current is required in the operating coil, to close the contacts than to start the disk turning from the No. 10 time position. This ratio is approximately 1.4 to 1 and will not be of much importance on the applications to which this relay is usually applied.

Since this relay operates at very high torque level, it is supplied with a "locked" time dial, to prevent any possible change in setting due to this high torque. To change a time dial setting, loosen the two screws in the dial hub, turn the time dial to the desired setting and retighten the screws.

Typical time-current curves and internal connections diagram for this relay are shown by Figures 1 and 2 of this instruction book. Outline and panel drilling instructions are found in instructions GEH-1753 Figure 20.

APPLICATION

The Type IAC95F(-)A relay was designed specifically as a ground fault relay for low voltage systems (600 volts or less). Figure 3 shows the external connections for a generalized typical application. Note that the relay can be utilized with standard rated bar or window current transformers monitoring individual conductors (residual connection) or a window CT enveloping all conductors (zero sequence connection). Figures 4 and 5 are the external connection diagrams for two special applications. The scheme in Figure 4 provides ground fault protection for the equipment downstream of a grounded transformer. The relay could trip the main secondary breaker as shown here. Figure 5 gives a ground fault relay scheme for the main and tie breakers of a four-wire double ended load center where the neutral bus is grounded at one point. The instantaneous units of the 50/51 M-1 and 50/S1 M-2 relays that trip the main breakers are used to sense the direction of ground fault flow so that only the main breaker associated with the faulted transformer trips. In all cases it is intended that the instantaneous unit contact be wired in series with the time-overcurrent contact as shown in Figure 6. The quick reset of the instantaneous unit is used to eliminate consideration of the overtravel time of the time-overcurrent unit. Consequently, the instantaneous unit must be set at a current value equal to or below the time-overcurrent unit tap setting.

Since the Type IAC95F(-)A relay is uncompensated (no disk cut-out to account for control spring wind-up) it should never be applied as a phase relay or as a ground relay where significant current may flow through the operating coils for a non-fault condition. Unless this precaution is adhered to the relay may "meter". That is, currents below the pickup setting of the time overcurrent unit may cause the disk to rotate from the deenergized position.

RATINGS

The IAC95F(-)A relay has an instantaneous unit similar to those described in Instructions GEH-1753 except that it has no target. The range of the instantaneous unit is reduced to 3 1/3 to 1 as compared with those instantaneous units described in GEH-1753; the range is 1.5 to 5 amperes.

The Instantaneous unit coil is continuously rated at 96 percent of its maximum setting (4.8 amperes)

The Instantaneous unit contacts have a current-closing rating of 30 amperes for voltages not exceeding 250 volts.

Burdens for the instantaneous unit at 5.0 amperes 60 cycles at minimum pickup settings are as follows:

RATING (AMPS)	VOLT AMPS	IMPEDANCE	P.F.
1.5-5.0	13.25	0.53	.81

The range of the time overcurrent unit is 1.5 to 6 amperes; the tap combination is 1.5, 2.0, 2.5, 3.0, 4.0, 5.0 and 6.0 amperes.

Burdens for the IAC95F(-)A time overcurrent unit are as follows:

TABLE I

BURDEN - TIME OVERCURRENT UNIT

MIN. TAP	BURDEN AT MINIMUM PICKUP		
	VOLT AMPERES	WATTS	POWER FACTOR
1.5 AMPS	6.75	2.23	0.33

MULTIPLES OF MINIMUM TAP	BURDEN		
	VOLT AMPERES	WATTS	POWER FACTOR
3 X MIN. TAP	52.3	22.2	0.422
10 X MIN. TAP	259.0	166.0	0.643
20 X MIN. TAP	660.0	442.2	0.67

For Burdens of the other taps on the relay can be calculated with the following equation:

$$\text{Burden (other tap)} = \left(\frac{\text{Min. Tap (amperes)}}{\text{Other Tap (amperes)}}\right)^2 \text{ X Burden of Min. Tap}$$

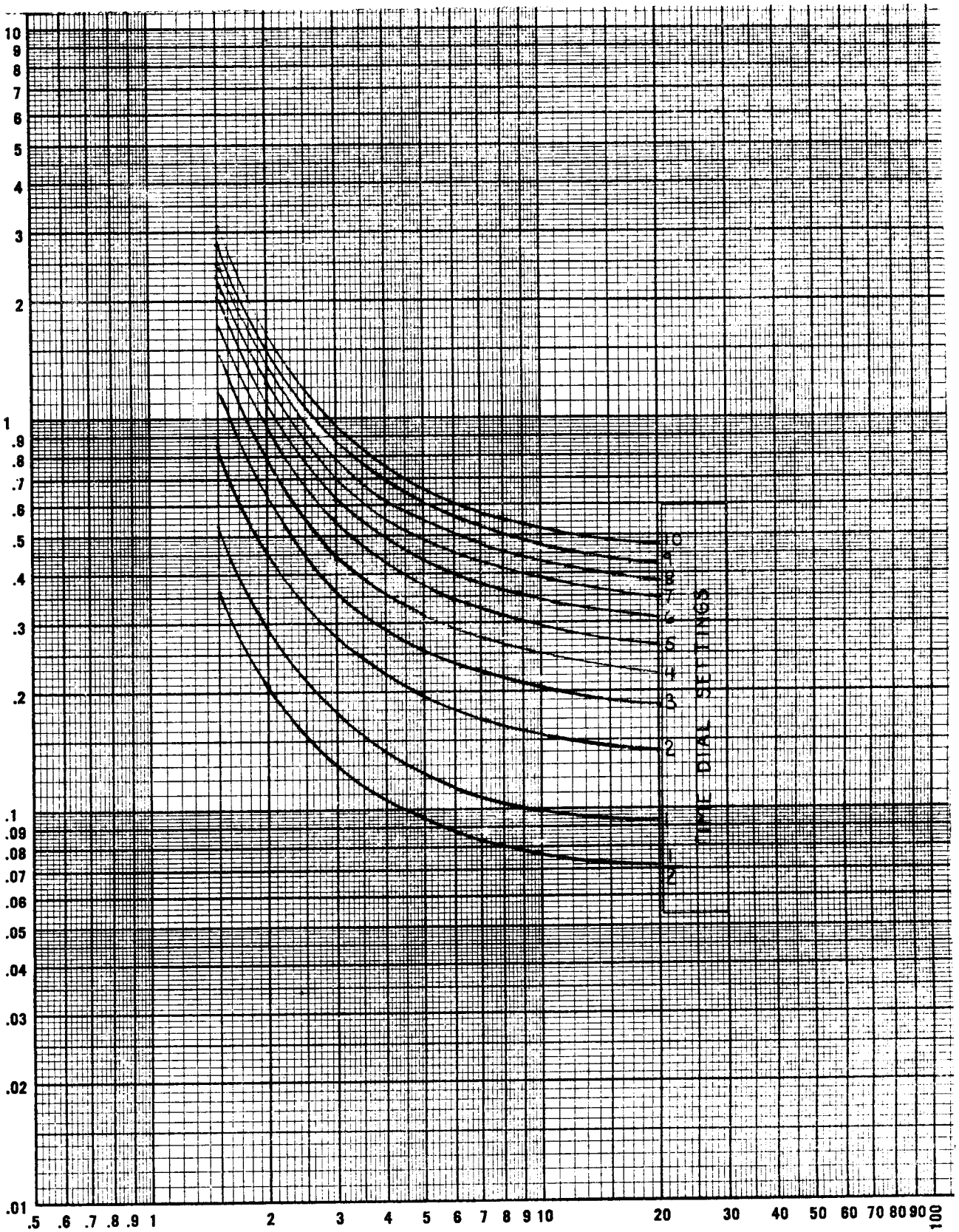


FIG. 1 (0183B4250-1) Time-Current Curves Of IAC95F(-)A Relay

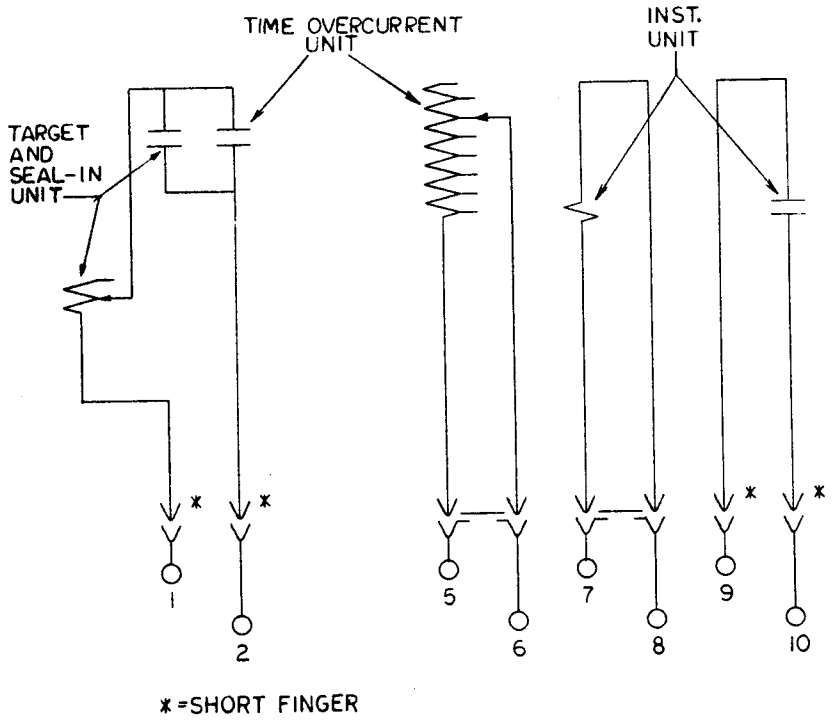


FIG. 2 (0246A2263-1) Internal Connections Diagram For The 12IAC95F(-)A Relay

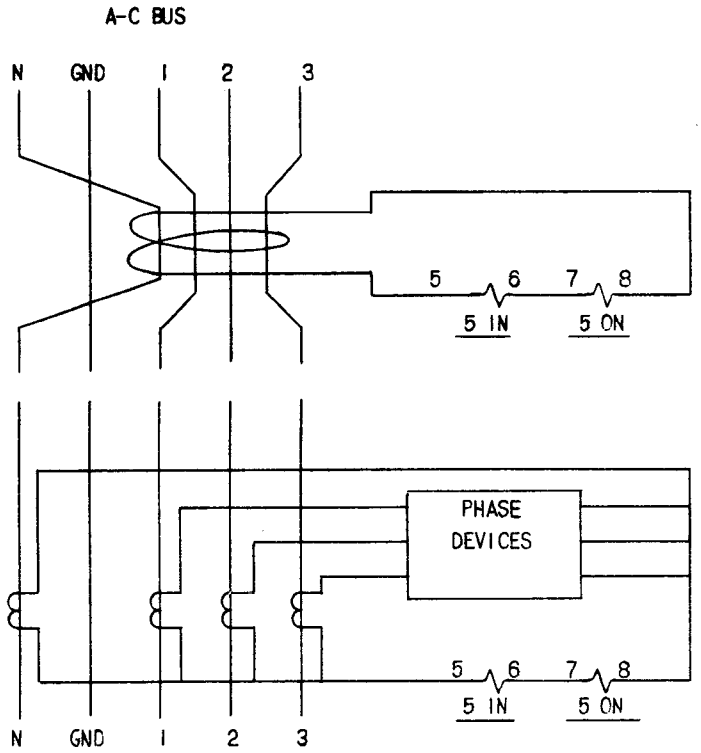
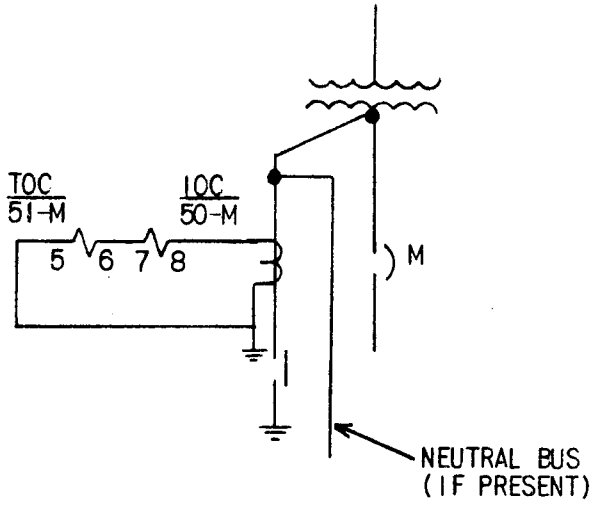
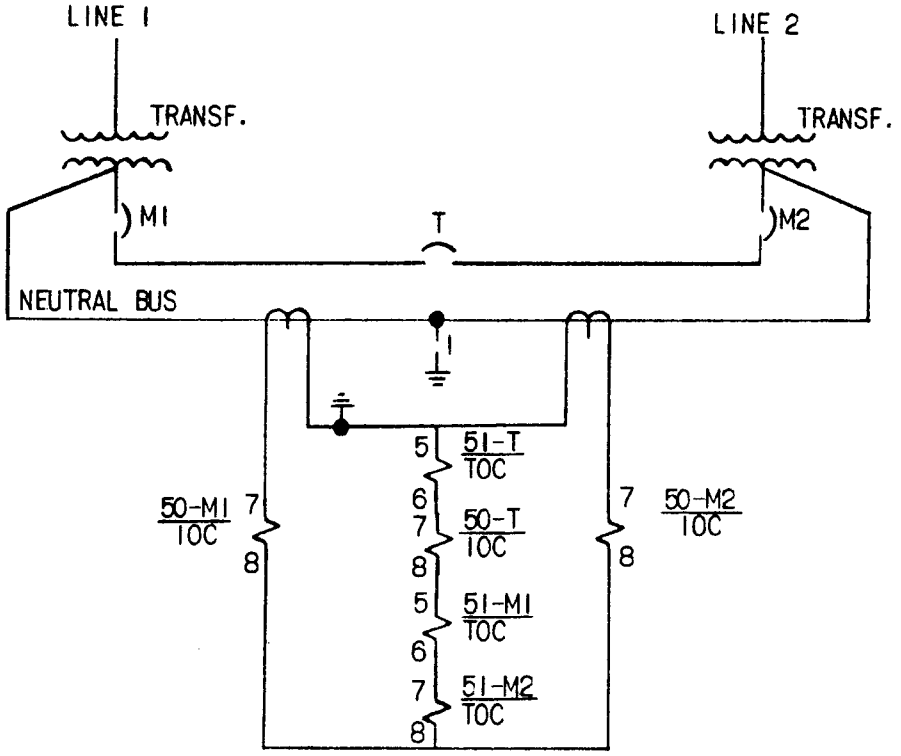


FIG. 3 (0246A3789-0) External Connections For The 12IAC95F(-)A Relay (Typical Application)



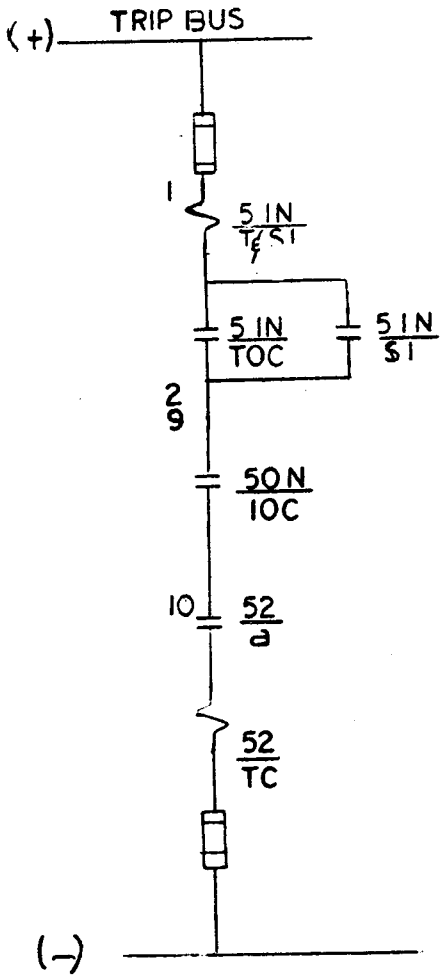
GROUND FAULT SCHEME FOR TRANSFORMER MAIN SECONDARY BREAKER

FIG. 4 (0246A6928-0) External Connections For The 12IAC95F(-)A Relay



GROUND FAULT SCHEME FOR THE MAIN AND TIE BREAKERS OF A FOUR-WIRE DOUBLE ENDED LOAD CENTER WITH NEUTRAL GROUNDED AT ONE POINT.

FIG. 5 (0246A6929-0) External Connections For The IAC95F(-)A Relay



LEGEND			
DEVICE NO.	TYPE	INCL ELEM	DESCRIPTION
50/51	IAC		OVERCURRENT RELAY
		5 IN	TOC-TIME OVERCURRENT UNIT
		5 ON	IOC-INSTANTANEOUS OVERCURRENT UNIT
		T 51	TARGET AND SEAL IN UNIT
52			CIRCUIT BREAKER
		TC	TRIP COIL
		a	AUXILIARY CONTACT

FIG. 6 (0246A7993-0) External Connections For The Trip Circuit Of The 12IAC95F(-)A Relay