INSTRUCTIONS

GEI-50254B
Supplement to GEH-1788
Supersedes GEI-50354A

RELAYS

TIME OVERCURRENT RELAY

TYPE IAC53M

GENERAL ELECTRIC

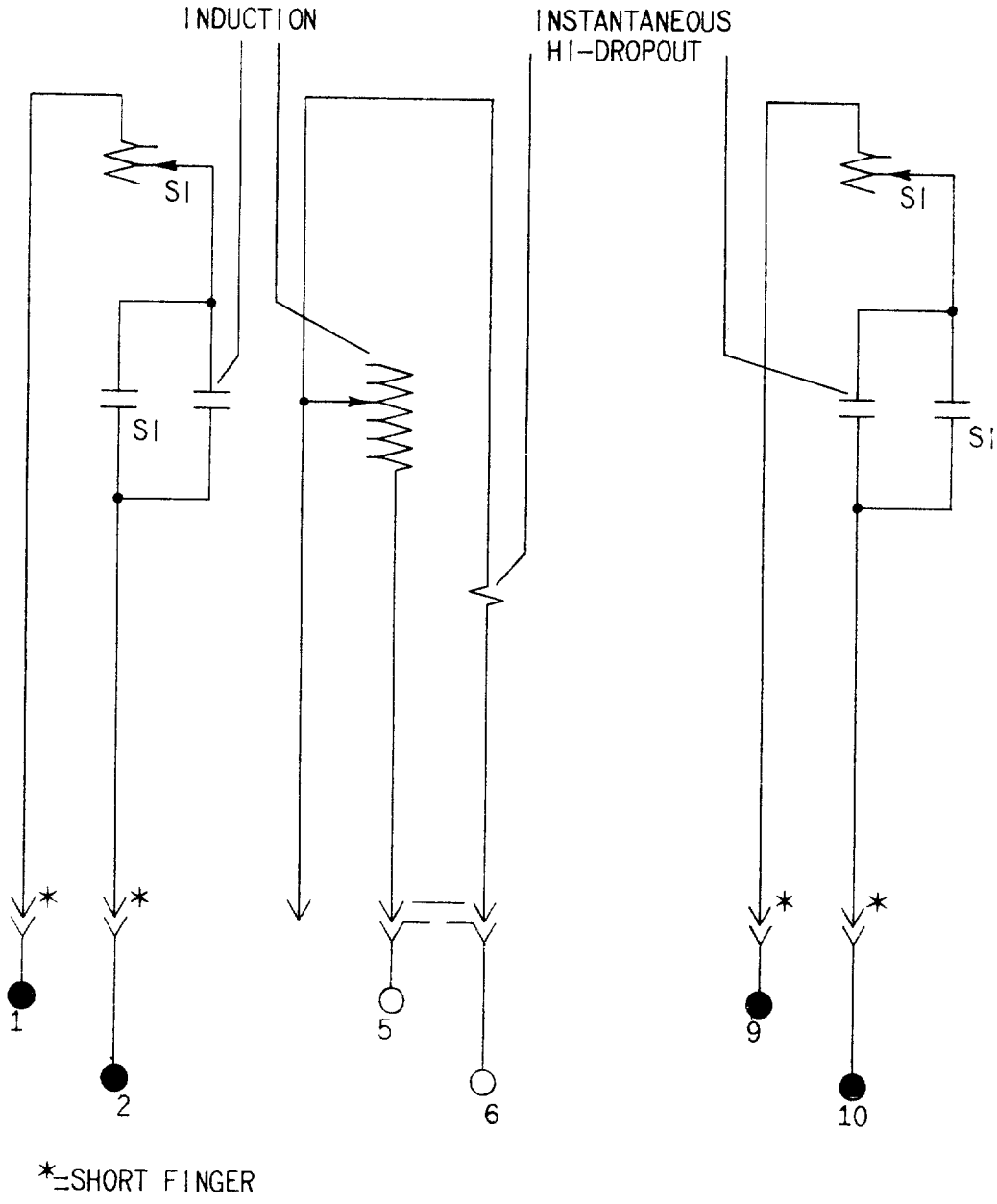

Fig. 1 (418A734-1) Internal Connection Diagram for Type IAC53M relay

TIME OVERCURRENT RELAY
TYPE IAC53M

INTRODUCTION

* These instructions are a supplement to instruction book GEH-1788. The combination of the two books form instructions for the Type IAC53M relays.

* These relays provide for a target seal-in unit for both the time overcurrent element and the instantaneous overcurrent unit. The type IAC53M relay is similar to the Type IAC53A with the addition of a right hand target and seal-in unit and a high-dropout instantaneous unit mounted in the rear of the relay unit.

The special high-dropout instantaneous unit is constructed without a target and is designed to yield dropout values of 80 percent, or higher, of pickup current. The pole piece is constructed and secured with a special wave washer so that it can be rotated to the most favorable position. The unit may be calibrated in the standard manner once the pole piece has been adjusted for 80 percent dropout or higher.

HIGH-DROPOUT INSTANTANEOUS UNIT

The high-dropout instantaneous unit contacts will close 30 amperes at voltages less than 250 volts. The coil ratings available are shown in Table I.

TABLE I

RATINGS OF HIGH-DROPOUT INSTANTANEOUS UNIT COILS

PICKUP RANGE (AMPS)	CONTINUOUS RATING (AMPS)	ONE SECOND RATING (AMPS)
0.5 - 1.5	0.75	12
1.0 - 3.0	1.5	25
2.0 - 6.0	3.0	50
4.0 - 12	6.0	100
10 - 30	15.0	200
20 - 60	30.0	320

The high-dropout instantaneous unit is similar to the standard instantaneous unit except it has no target, and dropout current is approximately 80 - 90 percent of the pickup current. Fig. 2 is a picture of the high-dropout unit.

The adjustable core (A) sets the pickup level. Turning the core down (clockwise, top view) lowers the pickup, while turning the core up (counterclockwise, top view) increases the pickup. Before attempting to turn the core, the locknut (B) must be loosened. After adjusting the core, the locknut must be retightened. When loosening or tightening the locknut, the sleeve (C) to which the shading ring (D) is attached must be held to prevent it from turning. Rotation of the shading ring sets the dropout level

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.

To the extent required the products described herein meet applicable ANSI, IEEE and NEMA standards; but no such assurance is given with respect to local codes and ordinances because they vary greatly.

and thereby determines the quietness of operation in the picked up position. The core has been factory set to obtain 80 percent dropout at the minimum setting and approximately 90 percent dropout at the maximum setting. Should it be necessary to change the dropout setting, the sleeve (C) to which the shading ring (D) is attached must always be turned in the clockwise direction (top view). This will prevent the sleeve and shading ring assembly from being loosened

The unit will pick up at the scale-plate marking plus or minus five percent with gradually applied current. The operating time is shown in Fig. 3. Fig. 4 shows transient overreach characteristics.

Burden data for 60 hertz units is shown in Table II.

TABLE II

Range Amperes	Burden at Min. Pickup Setting and Min. Current			Volt Amperes at 5 Amperes Calculated from Input at Min. Pickup (I^2Z)
	R ohms	X ohms	Z ohms	
0.5-1.5	12.7	10.6	16.5	412
1.0-3.0	3.2	2.6	4.0	100
2.0-6.0	0.76	0.66	1.0	25
4.0-12	0.19	0.17	0.25	6.2
10-30	0.042	0.027	0.050	1.25
20-60	0.015	0.008	0.017	0.42

INSTALLATION

The outline and panel drilling diagram is shown in Fig. 20 of the included instructions.

The internal connection diagram is shown in Fig. 1 of this supplement.

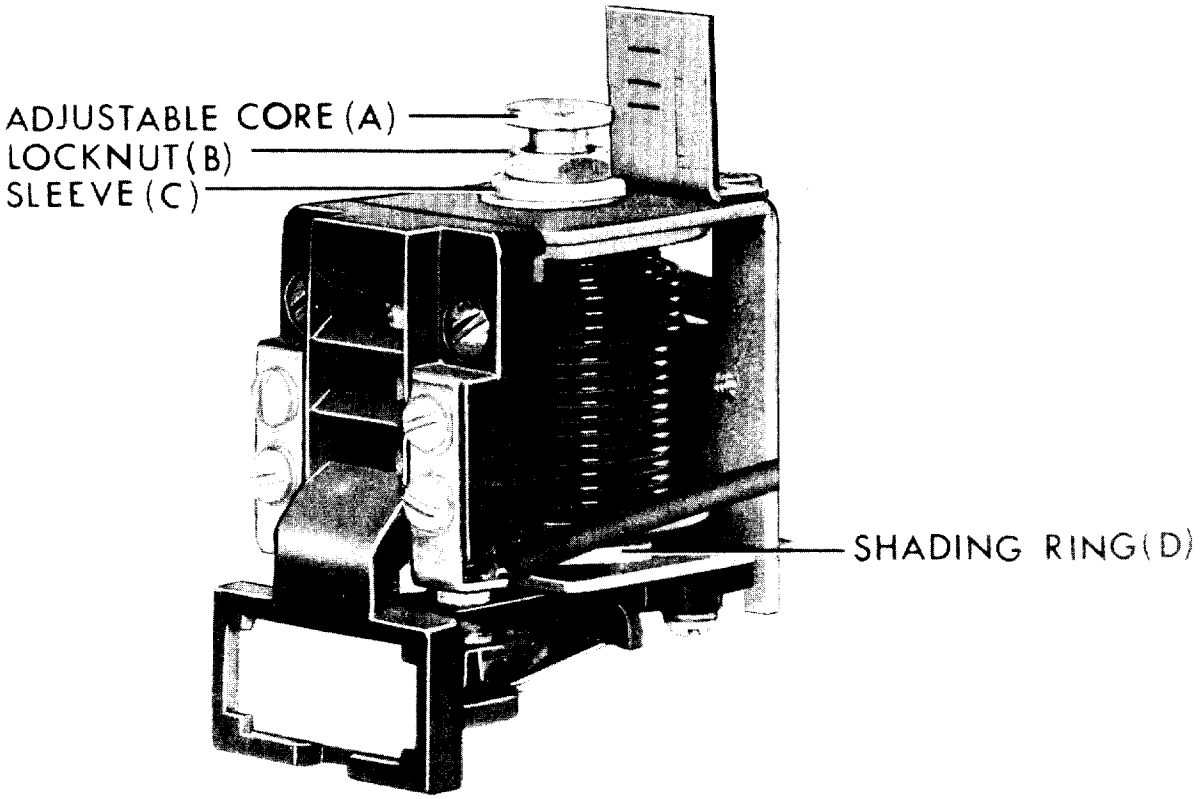

Fig. 2 (8036365) Construction of the High-dropout Unit

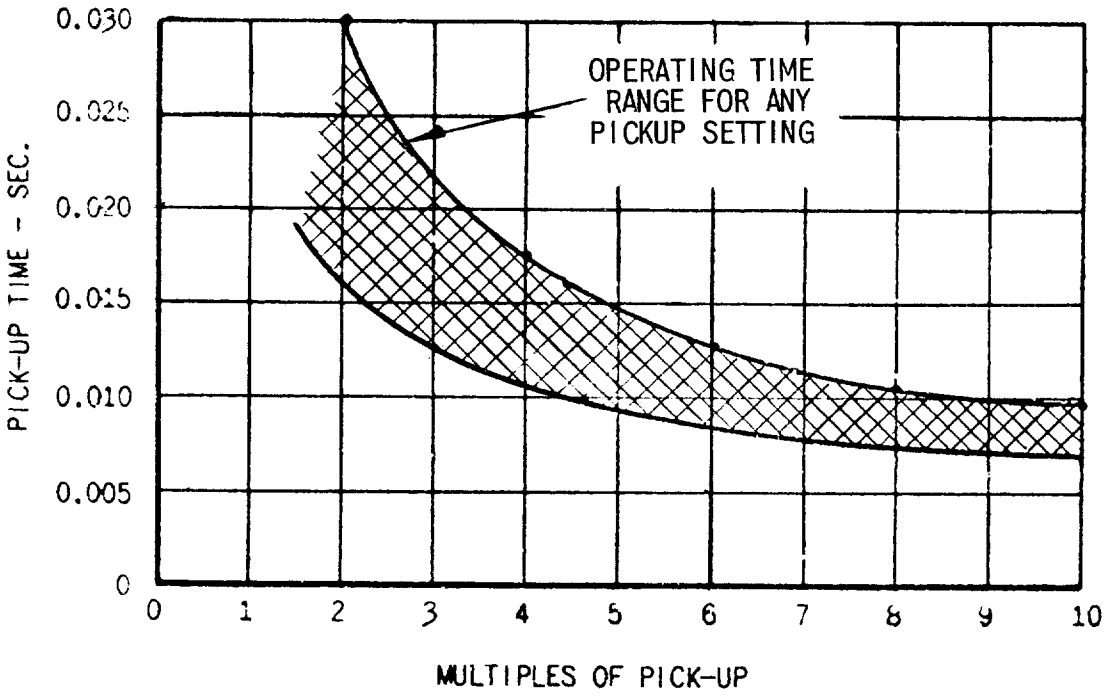

Fig. 3 (K-6306872-5) Operating Time Versus Current for the Standard Instantaneous Unit

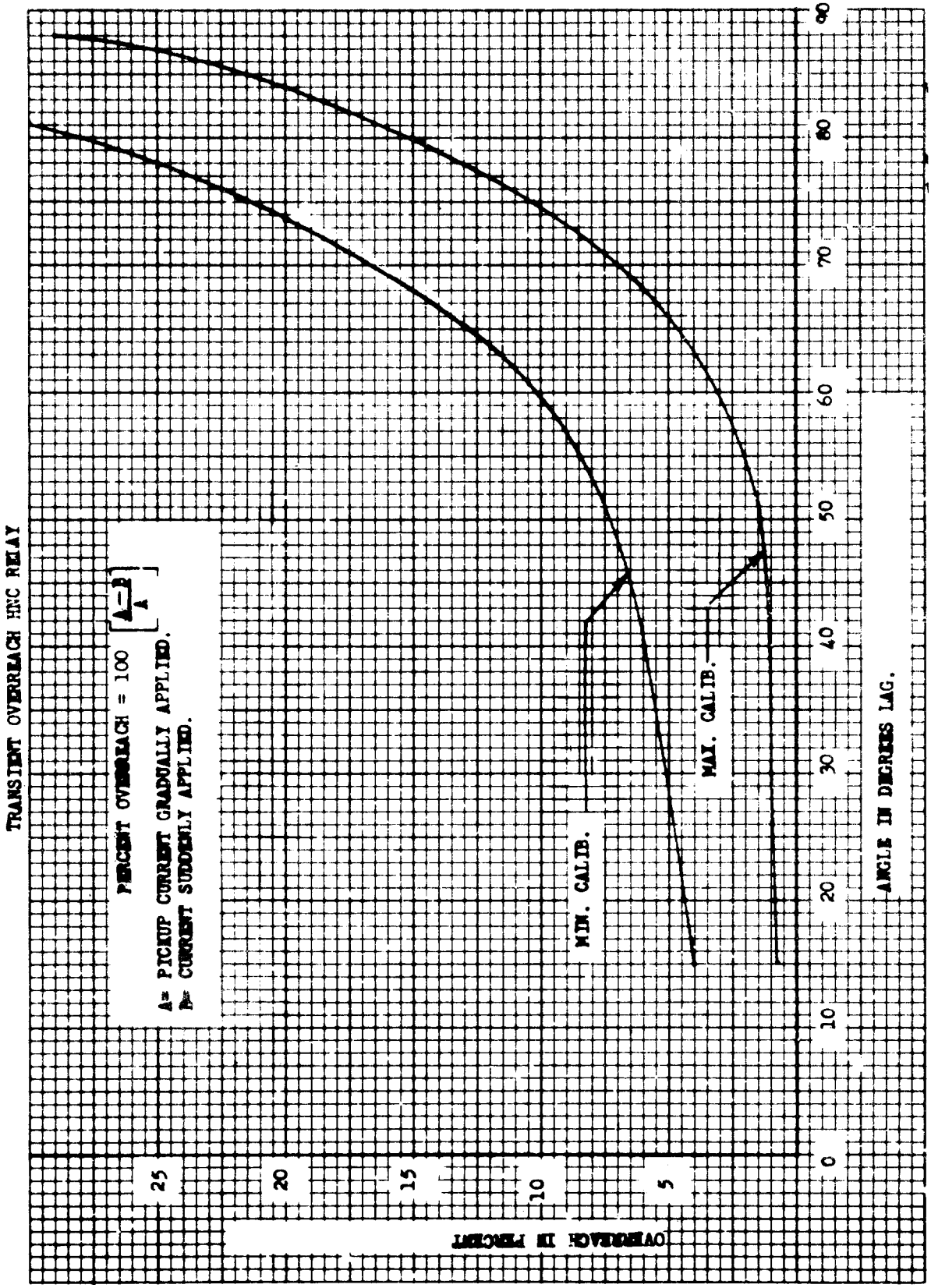

Fig. 4 (0195A4950-0) Transient Overreach of the High Dropout Instantaneous Unit

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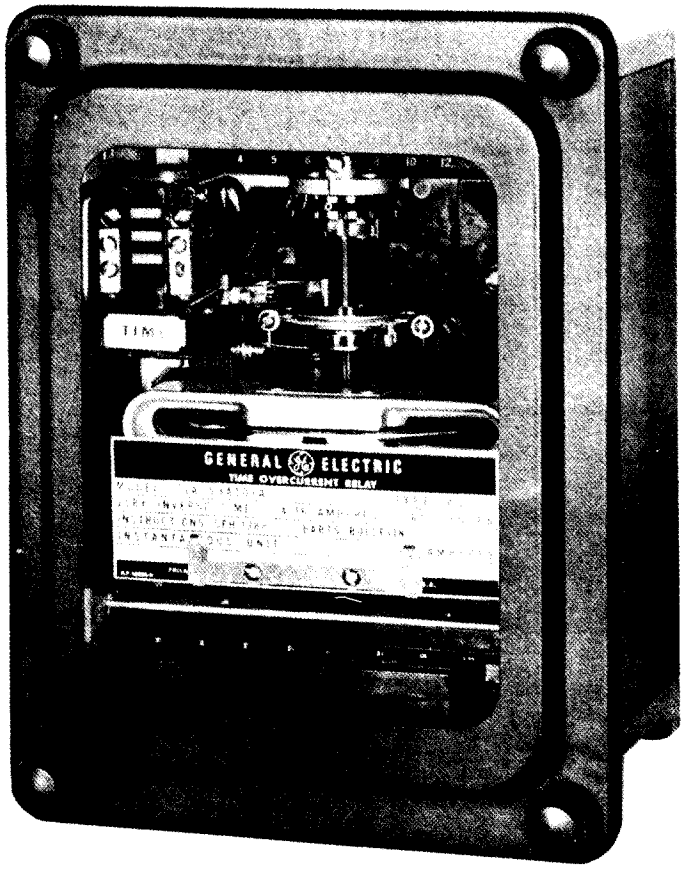
INSTRUCTIONS

GEH-1788L

TIME OVERCURRENT RELAYS

TYPES

IAC53A	IAC53R
IAC53B	IAC54A
IAC53C	IAC54B



GENERAL ELECTRIC

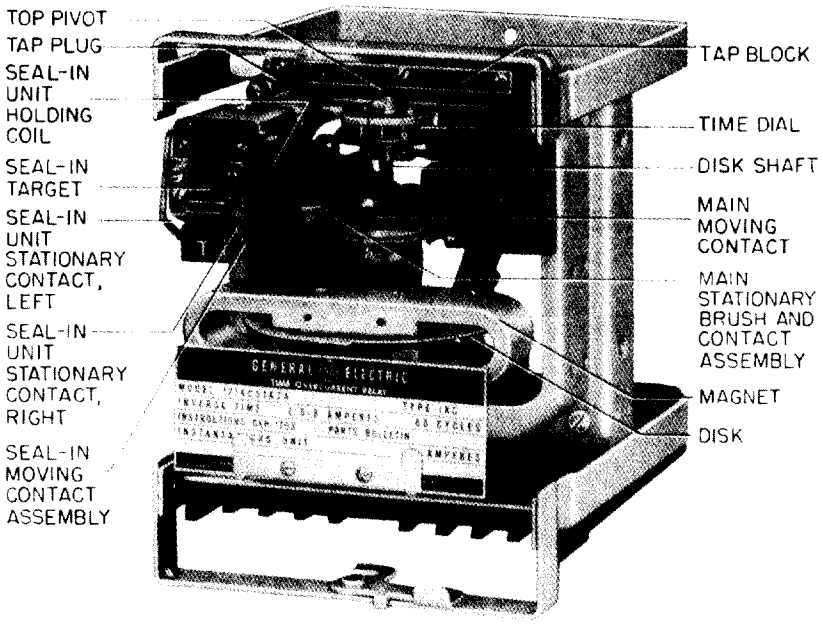


Fig. 1 (8022525)

Fig. 1 The Induction Unit for Type IAC Relays (Front View)

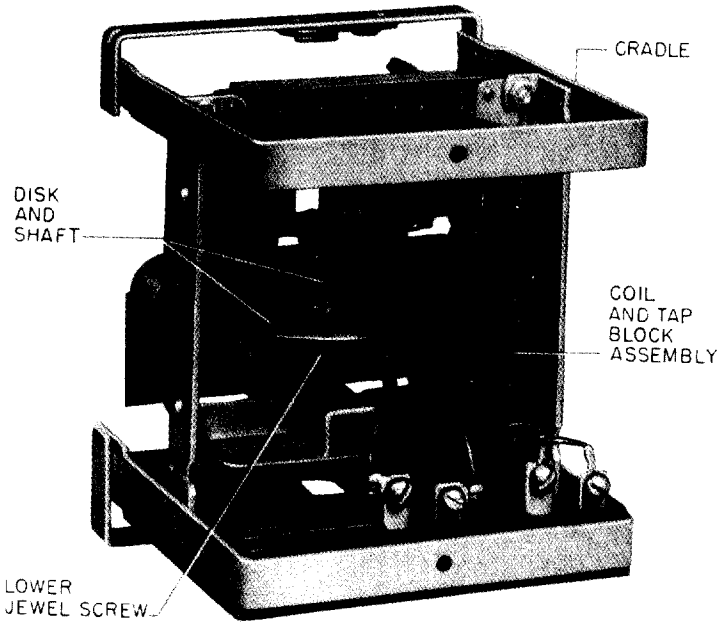


Fig. 2 (8022528)

Fig. 2 The Induction Unit for Type IAC Relays (Rear View)

Cover (8035285)

TIME OVERCURRENT RELAYS
TYPE IAC

INTRODUCTION

Type	Contact Circuits	Instan. Unit	A-C Trip Unit	Induc. Unit	Outline & P. D.	Int. Conn.
IAC53A(-)A	One	No	No	One	Fig. 20	Fig. 12
IAC53B(-)A	One	Yes	No	One	Fig. 20	Fig. 13
IAC53C(-)A	One	No	Yes	One	Fig. 20	Fig. 14
IAC53R(-)A	One	Yes	Yes	One	Fig. 20	Fig. 15
IAC54A(-)A	Two	No	No	One	Fig. 20	Fig. 16
IAC54B(-)A	Two	Yes	No	One	Fig. 20	Fig. 17

The Types IAC53 and IAC54 relays are time overcurrent relays with a very-inverse time characteristic. They are employed to protect against overcurrent on single-phase and poly-phase circuits. The various relays described in this instruction book differ in the number of circuits they close, and if an instantaneous unit and/or an a-c tripping unit is included.

These relays consist of an induction unit or an induction unit with an instantaneous unit which permits instantaneous tripping for exteremely high currents, or an induction unit with an a-c tripping unit for use where d-c power is unavailable or a-c tripping is preferred. Since practically all Type IAC relays are composed of various combinations of the above (that is, the induction unit, the instantaneous unit and the a-c tripping unit), they are, for convenience, described separately in the following text. The above table indicates the units comprising each type and also lists the internal connections and outline and panel drilling diagrams.

INDUCTION UNIT

INTRODUCTION

The induction unit is the basic unit in all Type IAC relays. Figs. 1 and 2 show the induction unit mounted in the cradle. These units are of the induction-disk construction type. The disk is actuated by a current operating coil on a laminated U-magnet. The disk shaft carries the moving contact which completes the alarm or trip circuit when it touches the stationary contact or contacts. The disk shaft is restrained by a spiral spring to give the proper contact-closing current and its motion is retarded by a permanent magnet acting on the disk to give the correct time delay.

There is a seal-in unit mounted on the front to the left of the shaft. This unit has its coil in series and its contacts in parallel with the main contacts such that when the main contacts close the seal-in unit picks up and seals in. When the seal-in unit picks up, it raises a target into view which latches up and remains exposed until released by pressing a button beneath the lower left corner of the cover.

APPLICATION

The induction unit is the main unit in all Type IAC relays, supplying the very inverse time delay characteristics of the relay and sounding an alarm or tripping the breakers for overload currents which cause it to close its contacts.

OPERATING CHARACTERISTICS

The induction unit may have one or two circuit-closing contacts which close as the current increases to the pick-up value as set on the tap block. The time delay in closing the contacts is determined by the setting of the time dial (Fig. 1). The time-current characteristics are shown in Fig. 3.

RATINGS

The induction unit is designed to use any one of four operating coils, each having a different combination of taps as follows, 4,5,6,7,8,10,12, and 16 amperes; 1.5,2.0, 2.5, 3.0, 4.0, 5.0 and 6.0 amperes; 0.5, 0.6, 0.8, 1.0, 1.2, 1.5 and 2.0 amperes; 0.1, 0.12, 0.16, 0.2, 0.24, 0.3 and 0.4 amperes.

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.

To the extent required the products described herein meet applicable ANSI, IEEE and NEMA standards; but no such assurance is given with respect to local codes and ordinances because they vary greatly.

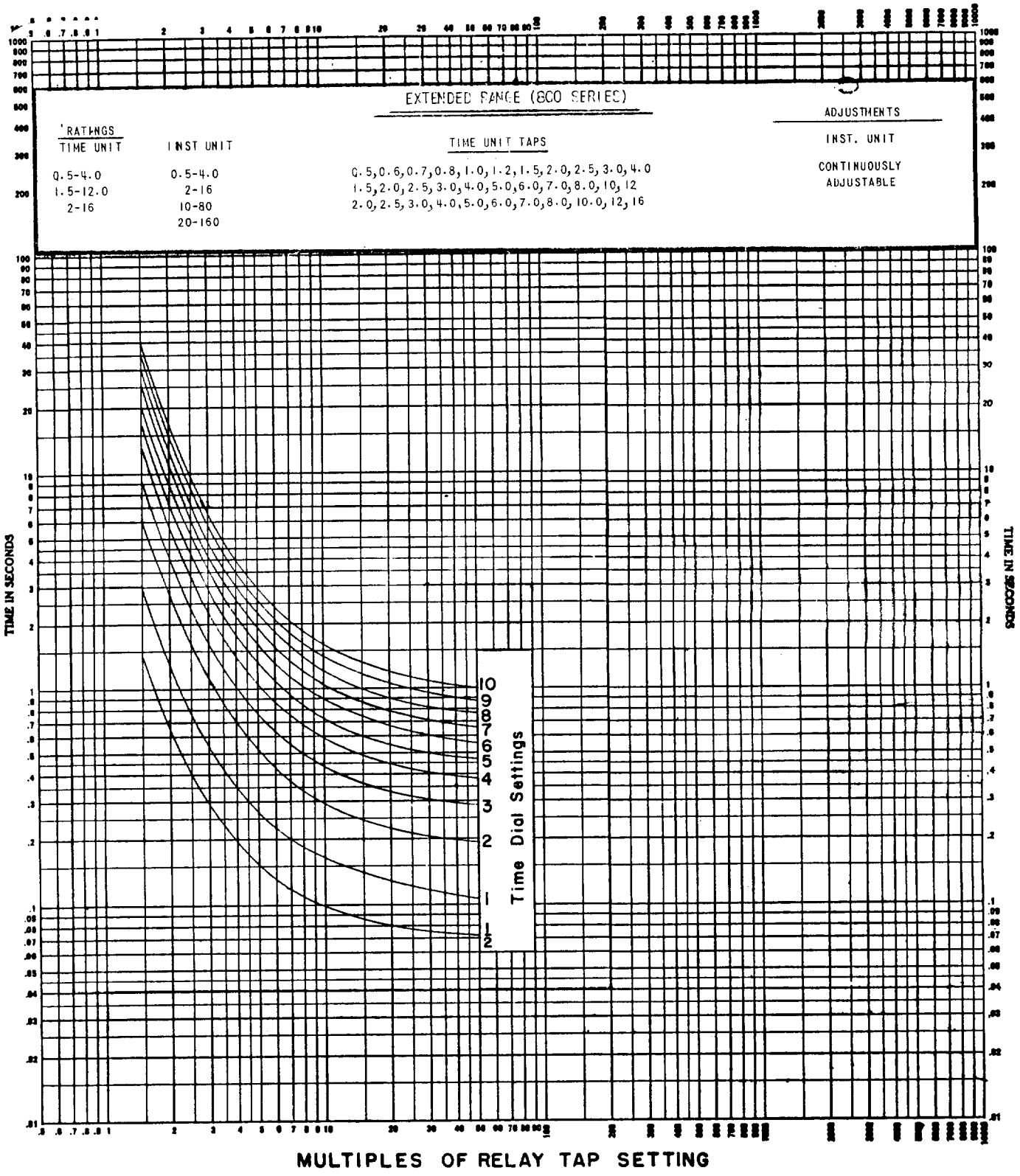


Figure 3 (0888B0270 [3]) **Time-Current Curves for Type IAC Relays with Very-Inverse-Time Characteristics**

Fig. 4 (8022527)

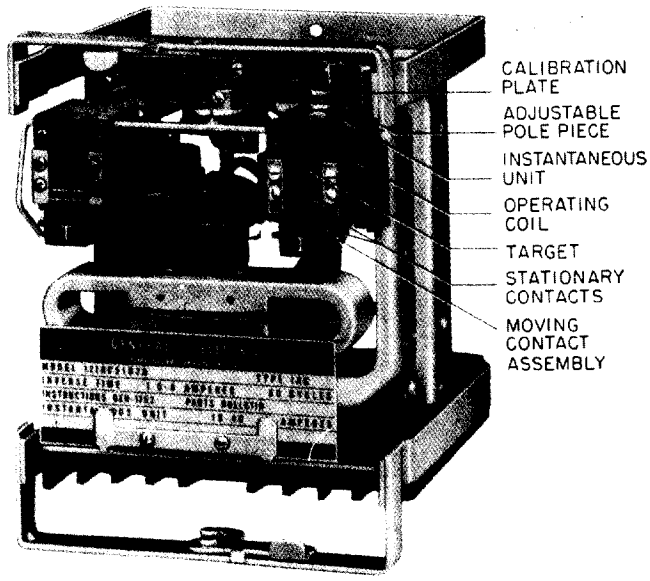


Fig. 4 Type IAC Relay with an Instantaneous Unit (Front View)

Fig. 5 (8022526)

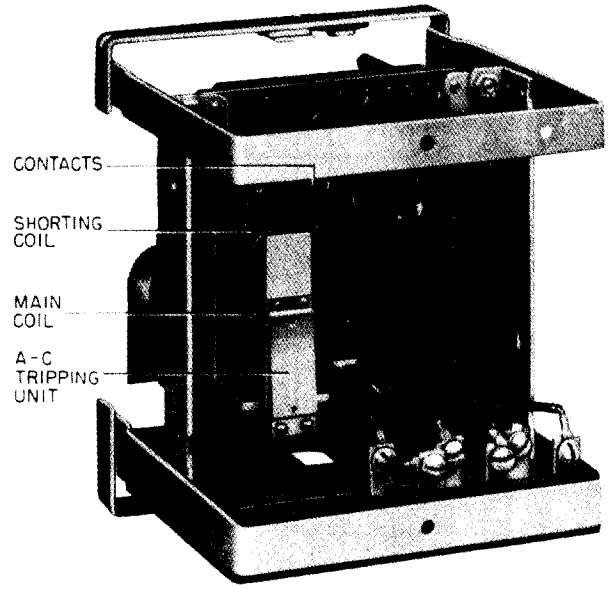


Fig. 5 Type IAC Relay with an A-C Trip Unit (Rear View)

The current-closing rating of the contacts is 30 amperes for voltages not exceeding 250 volts. The current-carrying ratings are affected by the selection of the tap on the target and seal-in coil as indicated in the following table:

Function	Amperes, a-c or d-c	
	2-Amp Tap	0.2 Amp Tap
Tripping Duty	30	5
Carry Continuously	3	0.3
Operating Range	2-30	0.2-2
Resistance	0.13	7
Impedance at 60 cy	0.53	52

If the tripping current exceeds 30 amperes an auxiliary relay should be used, the connections being such that the tripping current does not pass through the contacts or the target and seal-in coils of the protective relay.

BURDENS

Burdens for the standard coils are given in the following table. These are calculated burdens at five amperes based on burden of minimum tap.

Volt-ampere burdens for the lowest tap on any of the three coils can be determined for any value of current, up to 20 times tap setting, from Fig. 6.

Coil Amps	Freq.	Tap	Amps	Volt Amps	Imp. Ohms	PF
4-16	60	4	5	2.0	0.08	0.50
	50	4	5	1.7	0.07	0.50
	25	4	5	1.3	0.05	0.61
1.5-6	60	1.5	5	14.5	0.58	0.42
	50	1.5	5	12.0	0.48	0.42
	25	1.5	5	9.0	0.36	0.55
0.5-2	60	0.5	5	105.0	4.20	0.35
	50	0.5	5	86.0	3.45	0.34
	25	0.5	5	82.0	3.28	0.55
*						
0.1-0.4	60	0.1	5	3050	122	0.38
	50	0.1	5	2546	102	0.36

INSTANTANEOUS UNIT

INTRODUCTION

The instantaneous unit is a small instantaneous hinge-type unit which may be mounted on the right front side of the induction unit (See Fig. 4). Its contacts are normally connected in parallel with the contacts of the main unit. Its coil is connected in series with the operating coil of the main unit.

When the current reaches a predetermined value, the instantaneous unit operates, closing the contact circuit and raising its target into view. The target latches in the exposed position until released by pressing the button beneath the lower left-hand corner of the relay cover.

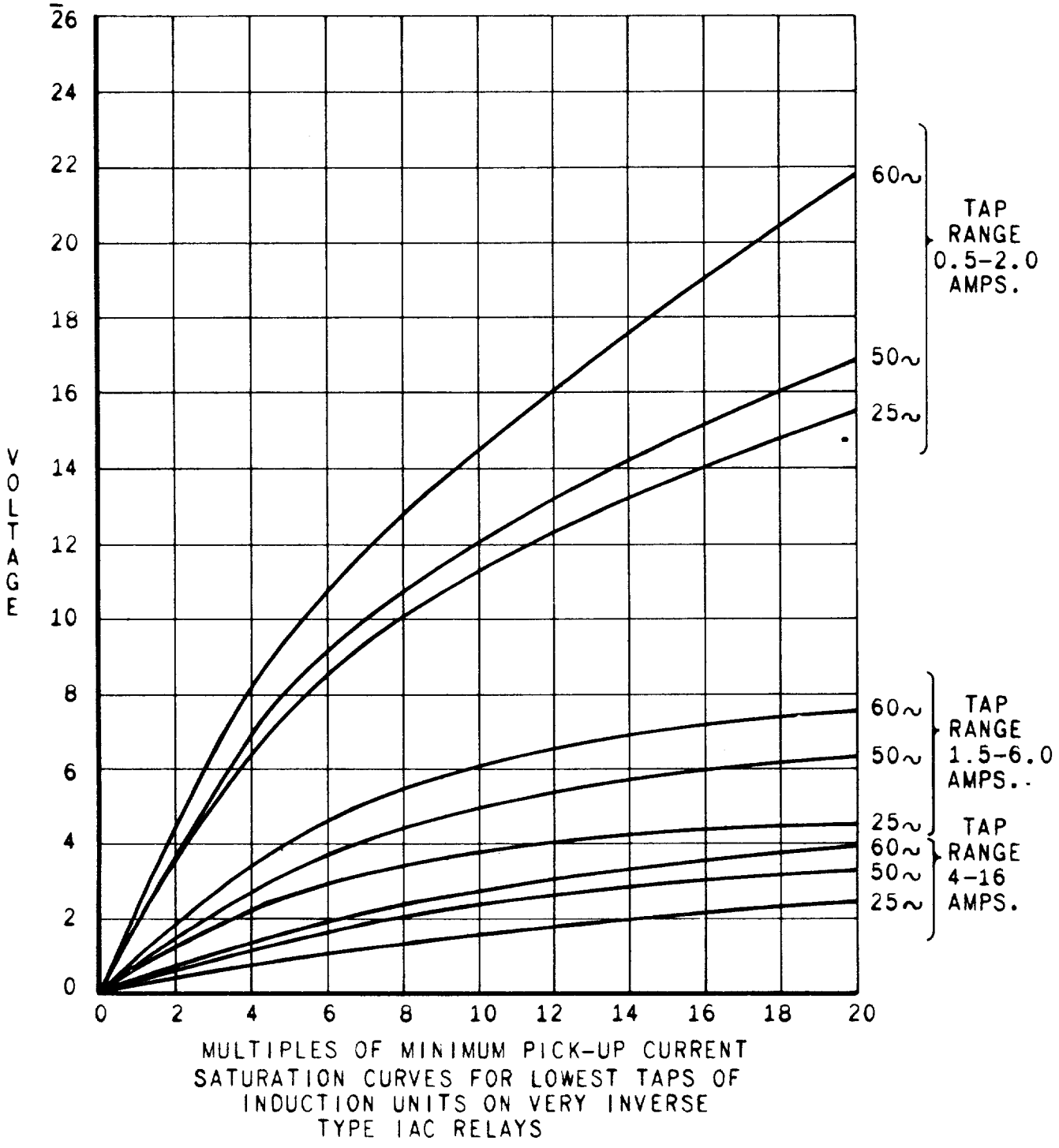


Fig. 6 (K-6400102 [1])

Fig. 6 Saturation Curves for Lowest Taps of tne Induction Unit of Type IAC Relays with Very-Inverse-Time Characteristics

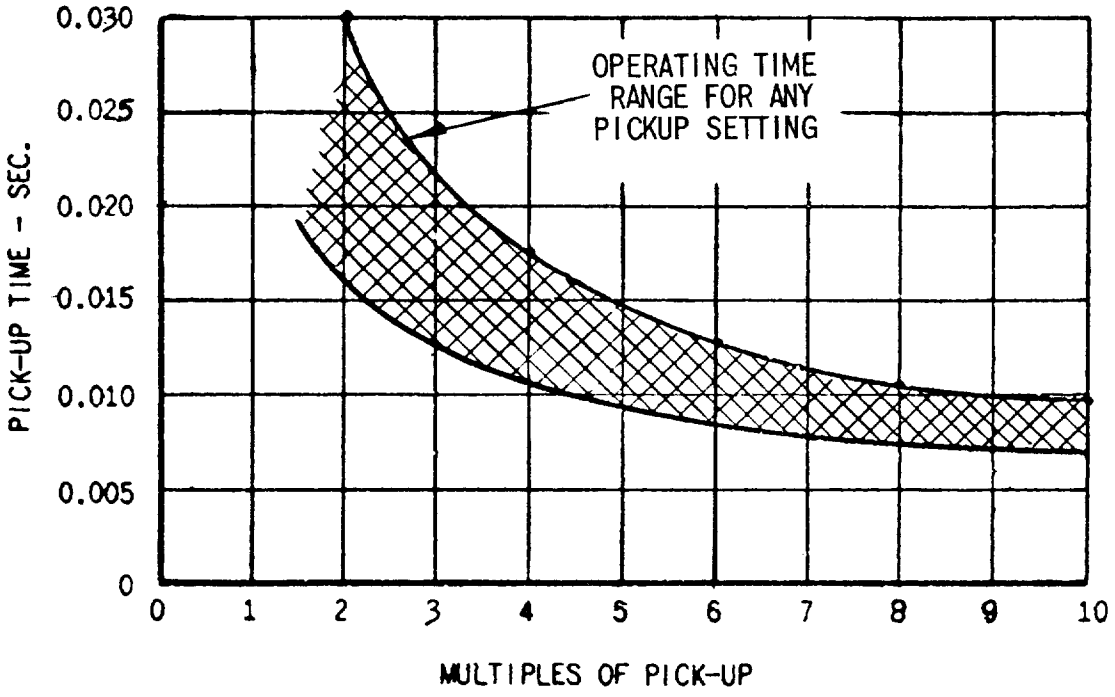


Fig. 7A (K-6306872 [5]) Time-Current Characteristics for Original Instantaneous Unit

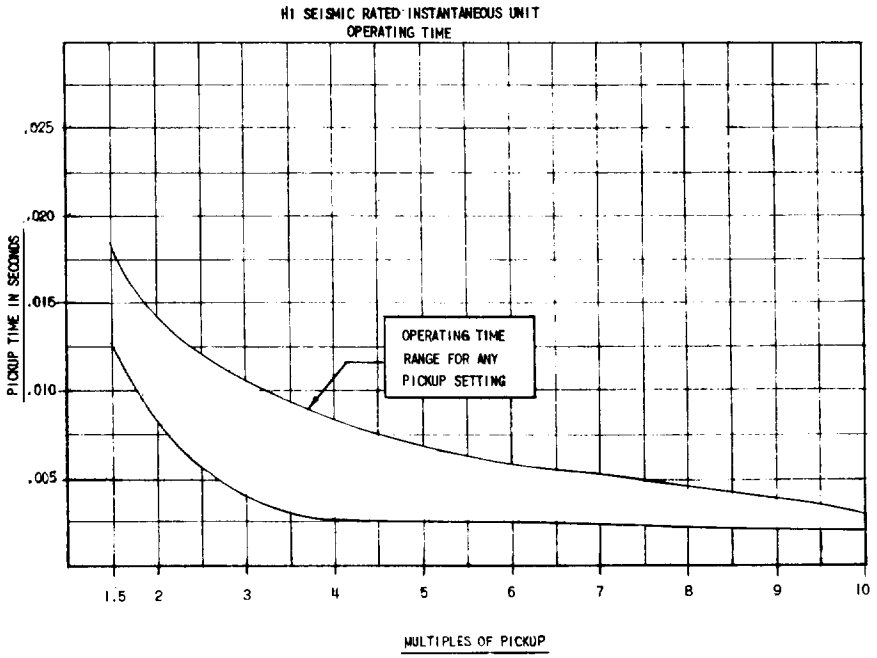


Fig. 7B (0208A8695-1) Time-Current Characteristics for the "Hi-G" Unit

APPLICATION

The instantaneous unit is used on certain Type IAC relay models to provide instantaneous tripping for current exceeding a predetermined value.

OPERATING CHARACTERISTICS

* The instantaneous unit operates over a four-to-one range and has its calibration stamped on a scale mounted beside the adjustable pole piece. Time-current characteristics are shown in Fig. 7A for the instantaneous unit used before 1977. In 1977 the instantaneous unit was modified to make it have a higher seismic rating. The new instantaneous unit can be identified by the marking "Hi-G" moulded into the front moulding just above the target windows. The time-current characteristic for the "Hi-G" unit is shown in Fig. 7B.

RATINGS

The instantaneous unit is designed to use the coils listed below;

Coil	Freq	Amp	Volt-Amp	Imp. Ohms	P.F.
0.5-2	60	5	360	14.4	0.74
1-4	60	5	90	3.6	0.77
2-8	60	5	22.5	0.90	0.83
	25	5	8.0	0.32	0.83
4-16	60	5	5.63	0.225	0.87
	50	5	4.77	0.191	0.87
	40	5	3.93	0.157	0.88
	25	5	2.37	0.095	0.88
7-28	60	5	1.68	0.067	0.88
10-40	60	5	0.83	0.033	0.95
	50	5	0.80	0.032	0.95
	25	5	0.68	0.027	0.98
20-80	60	5	0.20	0.008	0.95
	50	5	0.20	0.008	0.95
	25	5	0.18	0.007	0.98

A-C TRIPPING UNIT

INTRODUCTION

The a-c tripping unit is a Type REA relay unit designed to energize a circuit-breaker trip coil from its associated current transformer upon the operation of the main unit of the Type IAC relay. It transfers the current from the secondary of the current transformer into the trip coil and removes the current from the trip coil when the breaker trips.

The tripping unit is mounted on the rear of the frame opposite the tapped operating coil of the induction unit (see Fig. 5). The operation of this unit is illustrated in Fig. 11. The secondary current circulates through the induction unit current coil and the main coil of the Type REA auxiliary tripping unit, returning through the Type REA contacts to the current transformer. Normally, most of the flux generated by the main Type REA coil passes through the upper limb of the magnetic structure and holds the armature firmly against this limb. When the contacts of the induction unit close, the shorting coil of the Type REA unit is short-circuited and current flows in this coil by transformer action, causing a redistribution of flux which actuates the armature and the Type REA contacts. The opening of the Type REA contacts causes the secondary current to flow through the trip coil which trips the breaker.

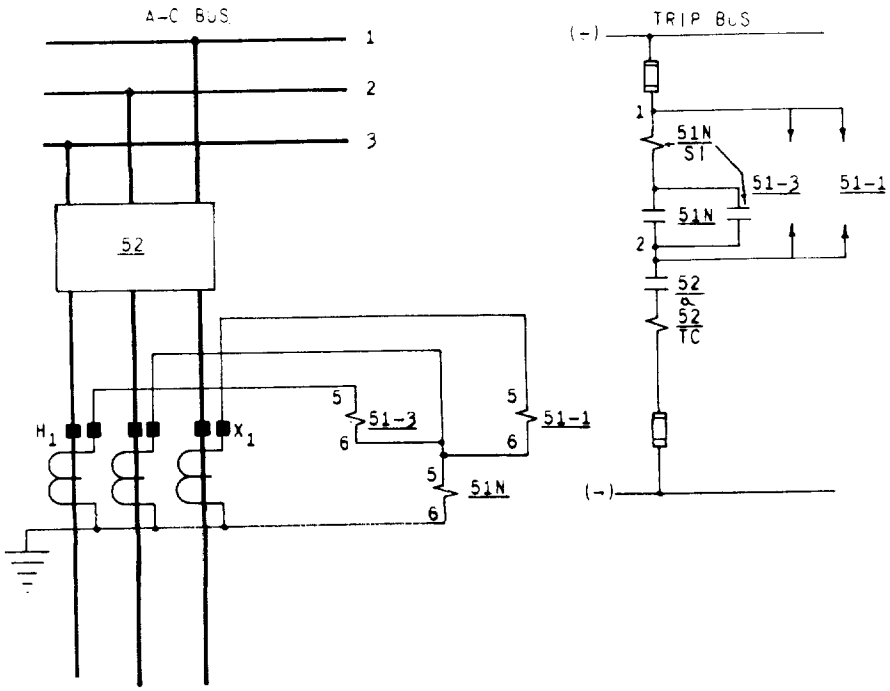


Figure 8 (K-6375667 [2]) External Connections of Three Type IAC53A Relays Used for Phase-to-Phase and Ground Overcurrent Protection of a 3-Phase Circuit

Device Function Numbers for Use with ALL External Diagrams

50	Instantaneous Unit
51	Overcurrent Relay, Type IAC
51N	Ground Overcurrent Relay, Type IAC
52	Power Circuit Breaker
SI	Seal-in Unit, with Target
TC	Trip Coil
A	Auxiliary Contact, closed when breaker closes

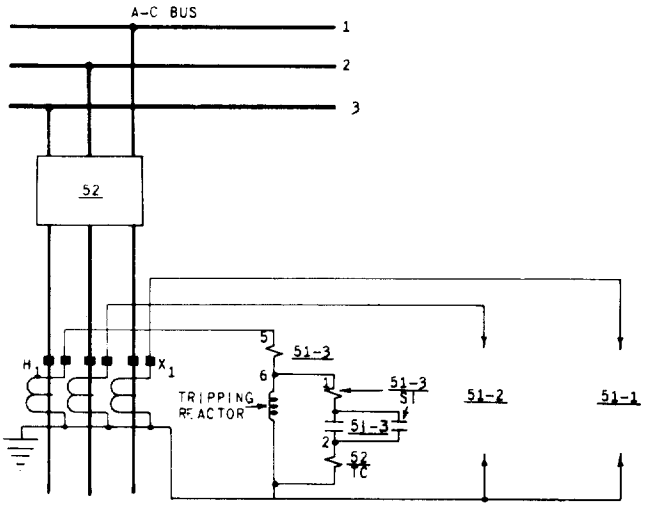


Figure 9. (K6375668-1) External Connections of Three Type IAC53A Relays used in Conjunction with Tripping Reactors for Protection of a 3-Phase Circuit

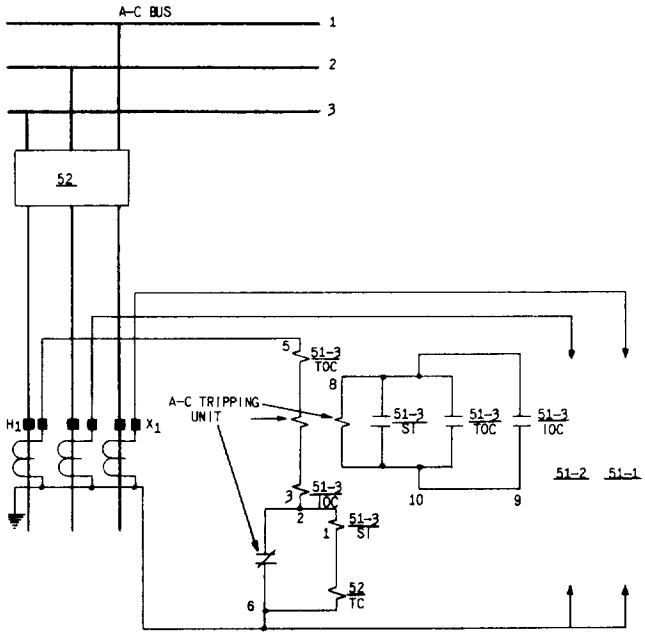


Figure 10. (K-6375669-6) External Connections of Three Type IAC53R Relays Used For 3-Phase Circuit Protection

APPLICATION

The a-c tripping unit is used in Type IAC relays where a reliable direct-current tripping source is not available and it is necessary to trip the breaker from the current-transformer secondary.

RATINGS

The a-c tripping unit has a continuous rating of five amperes but will operate on a minimum current of 3.5 amperes. It should be used with three-ampere trip coils. The contacts of these units will transfer current-transformer secondary current up to 100 amperes. For applications where the secondary current exceeds 100 amperes, the Type REA11B relay, which has contacts rated 200 amperes, can be used in conjunction with Type IAC overcurrent relays. The Type REA11B is not mounted inside the Type IAC case.

BURDENS

Burdens of the Type REA unit are given in the following table:

Frequency	Amps	Impedance in Ohms	PF	Volt-Amperes
60	5	0.49	0.80	12.2
50	5	0.33	0.80	8.3
25	5	0.23	0.62	5.8

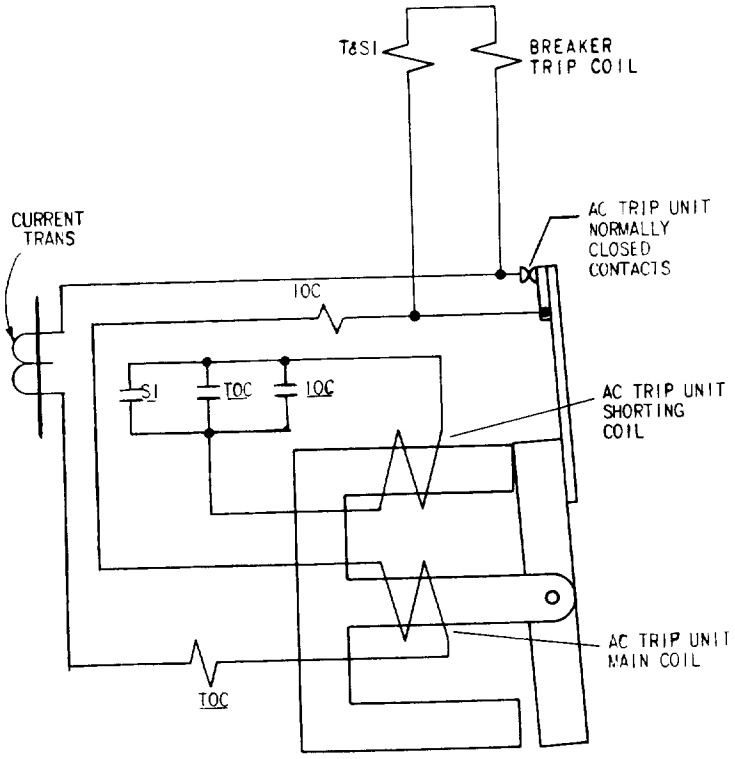


Fig. 11 (K-6154766 [2])

* Fig. 11 Diagram Illustrating Operation of Type IAC Relays having an A-C Tripping Unit

RECEIVING, HANDLING AND STORAGE

These relays, when not included as a part of a control panel will be shipped in cartons designed to protect them against damage. Immediately upon receipt of a relay, examine it for any damage sustained in transit. If injury or damage resulting from rough handling is evident, file a damage claim at once with the transportation company and promptly notify the nearest General Electric Apparatus Sales Office.

Reasonable care should be exercised in unpacking the relay in order that none of the parts are injured or the adjustments disturbed.

If the relays are not to be installed immediately, they should be stored in their original cartons in a place that is free from moisture, dust and metallic chips. Foreign matter collected on the outside of the case may find its way inside when the cover is removed and cause trouble in the operation of the relay.

INSTALLATION

LOCATION

The location should be clean and dry, free from dust and excessive vibration, and well lighted to facilitate inspection and testing.

MOUNTING

* The relay should be mounted on a vertical surface. The outline and panel diagram is shown in Fig. 20.

CONNECTIONS

The internal connection diagrams for the various relay types are shown in Figs. 12 to 17 inclusive. Typical wiring diagrams are given in Figs. 8 to 10 inclusive.

One of the mounting studs or screws should be permanently grounded by a conductor not less than No. 12 B & S gage copper wire or its equivalent.

INSPECTION

At the time of installation, the relay should be inspected for tarnished contacts, loose screws, or other imperfections. If any trouble is found, it should be corrected in the manner described under MAINTENANCE.

Fig. 12 (K-6209658 [10])

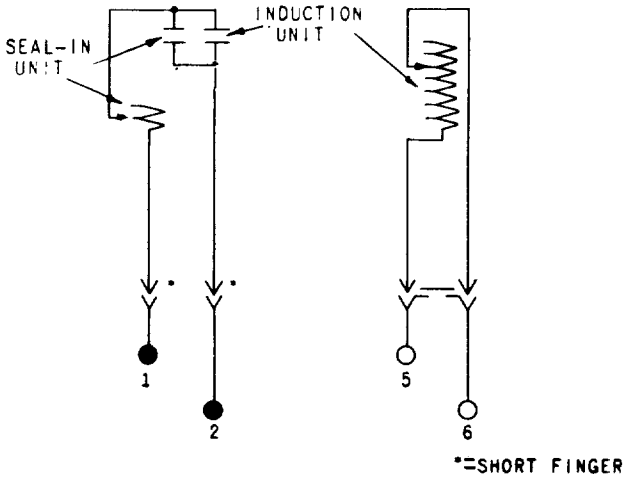


Fig. 12 Internal Connections for Type IAC53A Relay (Front View)

Fig. 13 (K-6209661 [10])

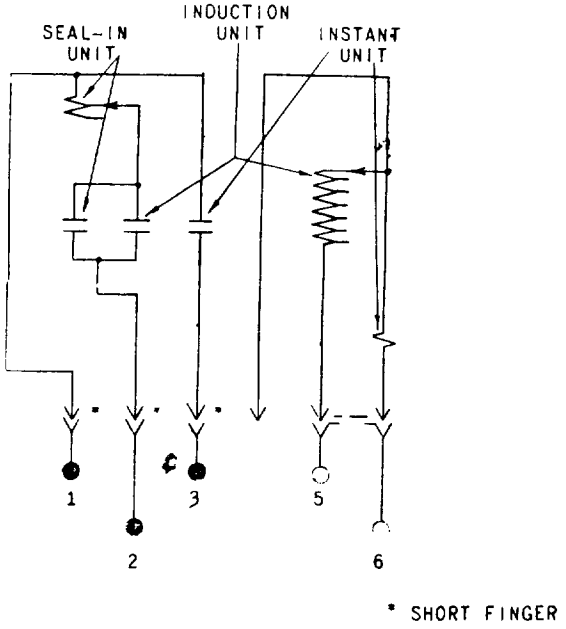


Fig. 13 Internal Connections for Type IAC53B Relay (Front View)

Fig. 15 (K-6209294 [3])

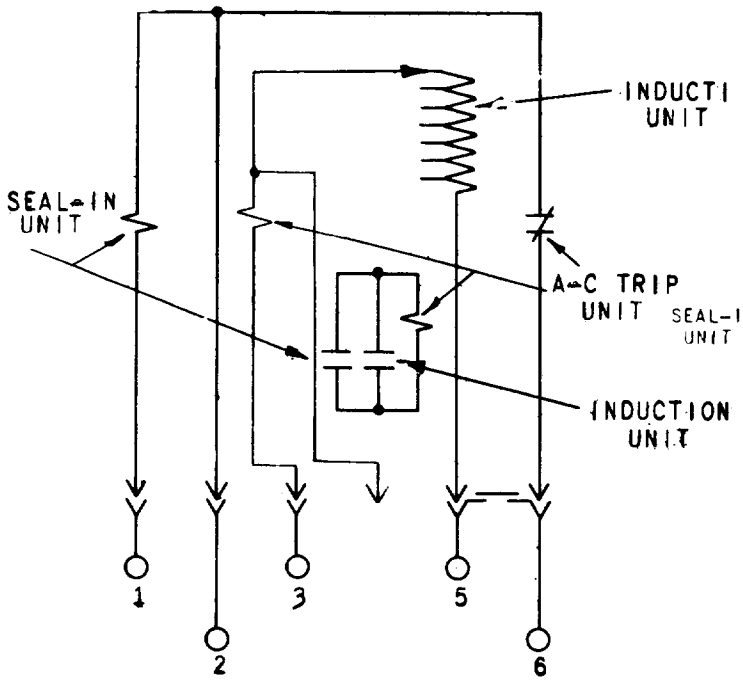
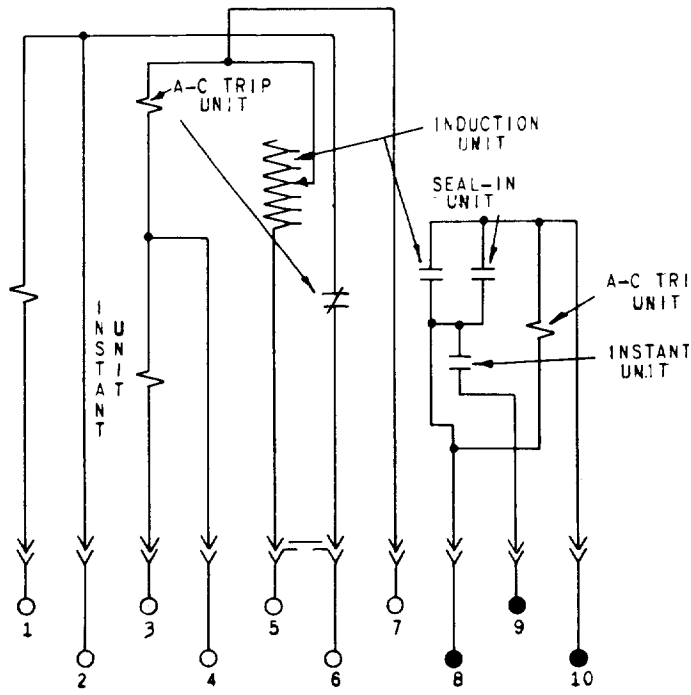


Fig. 14 (K-6209660-7) Internal Connections For Type IAC53C Relay (Front View)



* Fig. 15 Internal Connections for Type IAC53R Relay (Front View)

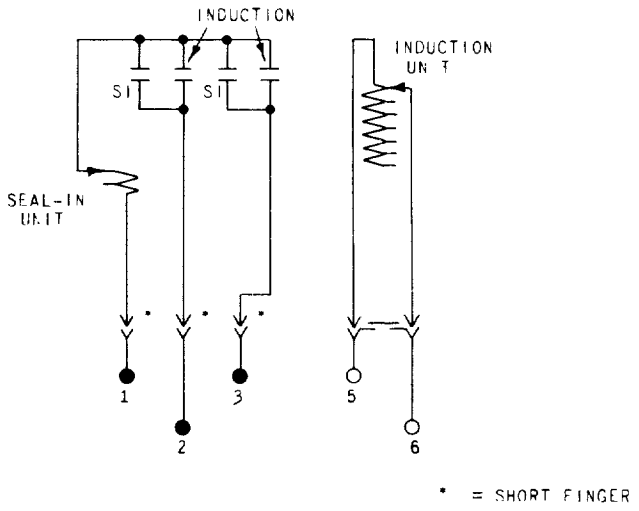


Fig. 16 Internal Connections for Type IAC54A

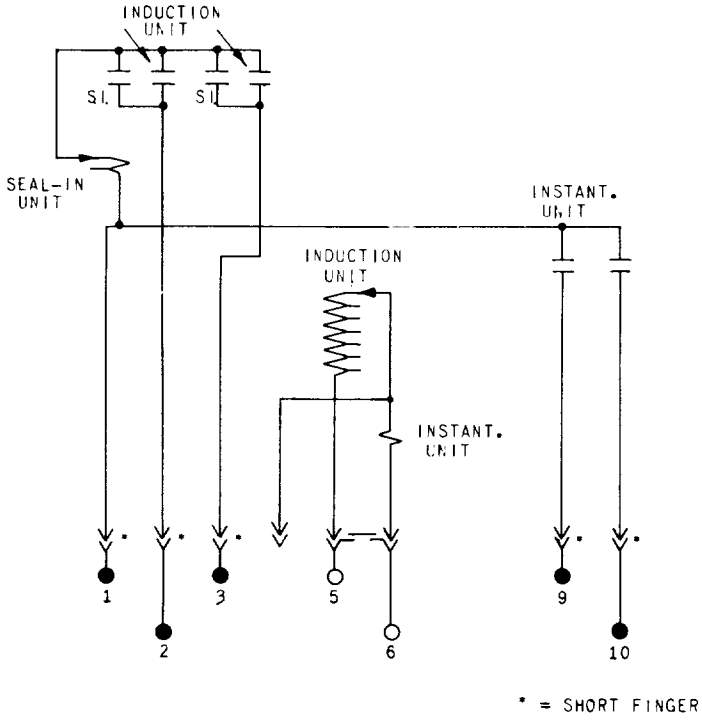


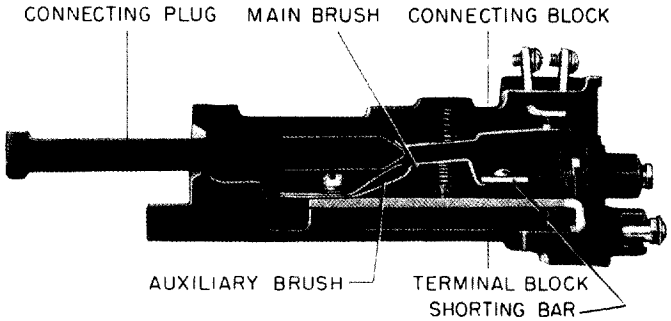
Fig. 17 Internal Connections for Type IAC54B

Fig. 16 (K-6209662 [4])

Fig. 17 (K-6209663 [8])

CAUTION:

Every circuit in the drawout case has an auxiliary brush. It is especially important on current circuits and other circuits with shorting bars that the auxiliary brush be bent high enough to engage the connecting plug or test plug before the main brushes do. This will prevent CT secondary circuits from being opened.



NOTE: AFTER ENGAGING AUXILIARY BRUSH, CONNECTING PLUG TRAVELS 1/4 INCH BEFORE ENGAGING THE MAIN BRUSH ON THE TERMINAL BLOCK

Fig. 18 (8025039)

Fig. 18 Cutaway of Drawout Case Showing Position of Auxiliary Brush

ADJUSTMENTS

TARGET AND SEAL-IN UNIT

For trip coils operating on currents ranging from 0.2 to 2.0 amperes at the minimum control voltage, set the target and seal-in tap screw in the 0.2-ampere tap.

For trip coils operating on currents ranging from 2 to 30 amperes at the minimum control voltage place the tap screw in the 2-ampere tap.

The tap screw is the screw holding the right-hand stationary contact of the seal-in unit. To change the tap setting, first remove the connecting plug. Then, take a screw from the left-hand stationary contact and place it in the desired tap. Next, remove the screw from the other tap and place it in the left-hand contact. This procedure is necessary to prevent the right-hand stationary contact from getting out of adjustment. Screws should not be in both taps at the same time.

INDUCTION UNIT

CURRENT SETTING

The current at which the contacts operate may be changed by changing the position of the tap plug in the tap block at the top of the relay. Screw the tap plug firmly into the tap marked for the desired current (below which the unit is not to operate).

When changing the current setting of the unit, remove the connecting plug to short-circuit the current-transformer secondary circuit. Next, screw the tap plug into tap marked for the desired current and then replace the connecting plug.

The pickup of the unit for any current tap is adjusted by means of a spring-adjusting ring. The ring may be turned by inserting a tool in the notches around the edge. By turning the ring, the operating current of the unit may be brought into agreement with the tap setting employed, if for some reason, this adjustment has been disturbed. This adjustment also permits any desired setting intermediate between the various tap settings to be obtained. The unit is adjusted at the factory to close its contacts from any time-dial position at a minimum current within five per cent of the tap plug setting. The unit resets at 90 per cent of the minimum closing value.

TIME SETTING

The setting of the time dial determines the length of time the unit requires to close its contacts when the current reaches the predetermined value. The contacts are just closed when the dial is set on 0. When the dial is set on 10, the disk must travel the maximum amount to close the contacts and therefore this setting gives the maximum time setting.

The primary adjustment for the time of operation of the unit is made by means of the time dial. However, further adjustment is obtained by moving the permanent magnet along its supporting shelf; moving the magnet toward the main shaft of the unit decreases the time, while moving it away increases the time.

If selective action of two or more relays is required, determine the maximum possible short-circuit current of the line and then choose a time value for each relay that differs sufficiently to insure the proper sequence in the operation of the several circuit breakers. Allowance must be made for the time involved in opening each breaker after the relay contacts close. For this reason, unless the circuit time of operation is known with accuracy, there should be a dfifference of about 0.5 second (at the maximum current) between relays whose operation is to be selective.

EXAMPLE OF SETTING

The time and current settings of the overcurrent unit can be made easily and quickly. Each time value shown in Fig. 3 indicates the time required for the contacts to close with a particular time-dial setting when the current is a prescribed number of times the current-tap setting. In order to secure any of the particular time-current settings shown in Fig. 3, insert the removable plug in the proper tap receptacle and adjust the time-dial to the proper position. The following example illustrates the procedure in making a relay setting:

Assume a Type IAC relay is used in a circuit where the circuit breaker should trip on a sustained current of approximately 450 amperes; also, the breaker should trip in 1.0 second on a short-circuit current of 3750 amperes. Assume further that current transformers of 60/1 ratio are used.

The current tap setting is found by dividing the minimum primary tripping current by the current transformer ratio. In this case, 450 divided by 60 equals 7.5 amperes. Since there is no 7.5 ampere tap, the 8-ampere tap is used. To find the proper time-dial setting to give 1.0-second time delay at 3750 amperes, divide 3750 by the transformer ratio. This gives 62.5 amperes secondary current which is 7.8 times the 8-ampere setting. By referring to the time current curves (Fig. 3), it will be seen that 7.8 times the minimum operating current gives 1.0-second time delay when the relay is set on the No. 6 time-dial setting.

The above results should be checked by means of an accurate timing device. Slight readjustment of the dial can be made until the desired time is obtained.

Aid in making the proper selection of relay settings may be obtained on application to the nearest Sales Office of the General Electric Company.

INSTANTANEOUS UNIT

Select the current above which is desired to have the instantaneous unit operate and set the adjustable pole piece so that the top of its hexagon head is even with the desired calibration on the scale. To raise or lower the pole piece, loosen the locknut and turn it up or down and then tighten in position.

The contacts should be adjusted to make at about the same time and to have approximately 1/8 inch wipe. This adjustment can be made by loosening the screws holding the stationary contacts and moving the contacts up or down as required.

A-C TRIPPING UNIT

The a-c tripping unit should not require any attention other than occasional cleaning of the contacts. However, if the adjustment should be lost, it may be restored as follows:

CONTACT ADJUSTMENT

With the unit de-energized, the movable contact should lie against the stationary contact with enough tension to always insure a good closed circuit. The movable contact brush should be free of any kinks. Also this contact brush should not touch the compound bushing supported from the top of the armature. The brass backing strip should be adjusted to allow a 1/16-inch contact gap with the contacts open. The compound bushing support should be adjusted to allow the back of the movable contact to just touch the brass backing strip when the armature operates to open the contacts. The outer edge of the compound bushing should be approximately 1/32 inch from the inner edge of the stationary-contact supporting post.

ARMATURE ADJUSTMENT

Loosen the two screws which hold the armature-assembly bracket to the bottom of the frame. Slide the bracket in or out, whichever is necessary, until the armature just touches the pole face of the upper core. In this position, the armature should be about 1/32 inch from the pole face of the lower core. Next, slide the bracket in until the armature leaf spring assumes a vertical position and is spaced clear of both armature and the vertical tip of the bracket. With this setting, the armature should be flush against the pole face of both cores, and should put enough pressure on the armature to always return it flush against the pole face of the lower core after each operation of the unit. This alignment is important as a slight gap between armature and pole face of the lower core after the unit operates may cause contacts to open momentarily, dropping the relay target when the circuit breaker is reclosed. Under these conditions, the momentary opening of the contacts is due to the shock of the armature being pulled in against the pole face when the lower coil is energized. Excessive pressure on the armature, caused by the bracket being pushed in too far, will result in too high a pickup or chattering of the movable contact during operation of the unit. Tighten the bracket screws securely after the proper adjustment has been obtained.

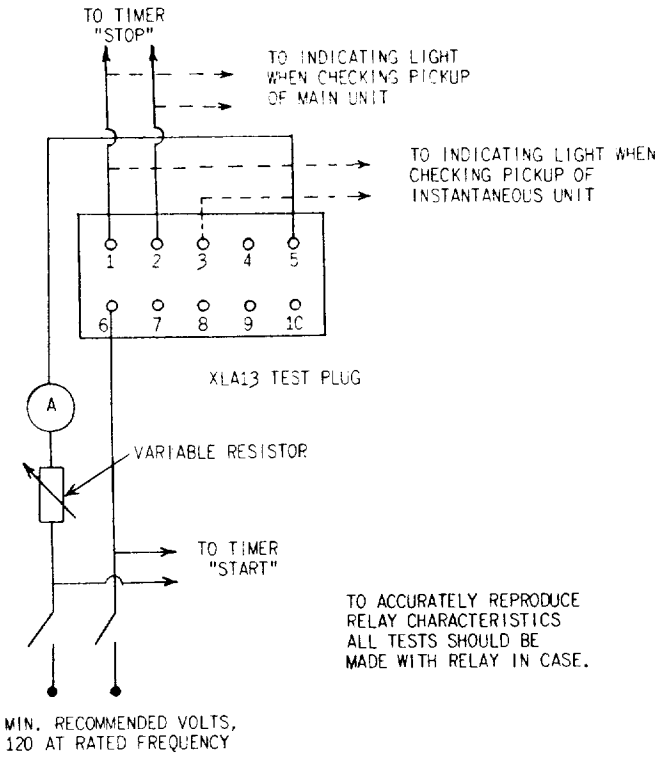


Fig. 19 (K-6154399 [7])

Fig.19 Test Connections for Testing Pickup & Time Curve of IAC Relays

OPERATION

The pick-up current should be checked on one or more of the taps and the time should be checked for one or more dial settings.

Recommended test connections for the above test are shown in Fig. 19.

Before the relay is put into service it should be given a check to determine that factory adjustments have not been disturbed. The time dial will be set at zero before the relay leaves the factory. It is necessary to change this setting in order to open the relay contacts.

MAINTENANCE

DISK AND BEARINGS

The lower jewel may be tested for cracks by exploring its surface with the point of a fine needle. The jewel should be turned up until the disk is centered in the air gaps, after which it should be locked in this position by the set screw provided for this purpose.

CONTACT CLEANING

For cleaning fine silver contacts, a flexible burnishing tool should be used. This consists of a flexible strip of metal with an etched roughened surface, resembling in effect a superfine file. The polishing action is so delicate that no scratches are left, yet corroded material will be removed rapidly and thoroughly. The flexibility of the tool insures the cleaning of the actual points of contact.

Fine silver contacts should not be cleaned with knives, files, or abrasive paper or cloth. Knives or files may leave scratches which increase arcing and deterioration of the contacts. Abrasive paper or cloth may leave minute particles of insulating abrasive material in the contacts and thus prevent closing.

The burnishing tool described is included in the standard relay tool kit obtainable from the factory.

PERIODIC TESTING

It is recommended that pickup of all units be checked at least once every six months.

ACCEPTANCE TESTS

ELECTRICAL

A. MAIN UNIT

Pickup

Set the relay at the 0.5 time dial position and minimum tap. Using the test connections of Figure 19 the main unit should close its contacts within ±5% of tap value current.

Time Test

Set the relay at the 5.0 time dial position and minimum tap. Using the test connections of Figure 19, and applying 5 times pickup current, the relay should operate at 1.31 seconds ±7%. With 2 times pickup current applied the operating time should be 7.21 seconds ±7%. With 10 times pickup current applied the operating time should be 0.72 seconds ±7%.

B. INSTANTANEOUS UNIT

Pickup

With gradually applied current the unit should pickup at ±10% of the minimum calibration. There should be no more than ±5% variation on repeated pickup checks. Be sure the target has been reset after each test.

C. TARGET SEAL IN UNIT

Pickup

The unit should pickup between 75 and 100% of tap value with the main unit contacts closed.

Dropout

Open the main unit contacts, the seal in unit should remain picked up. Reduce the current to 25% of tap value; the unit should drop out.

RENEWAL PARTS

It is recommended that sufficient quantities of renewal parts be carried in stock to enable the prompt replacement of any that are worn, broken, or damaged.

When ordering renewal parts, address the nearest Sales Office of the General Electric Company, specify the quantity required and describing the parts by catalogue numbers as shown in Renewal Parts Bulletin No. GEF-3883.

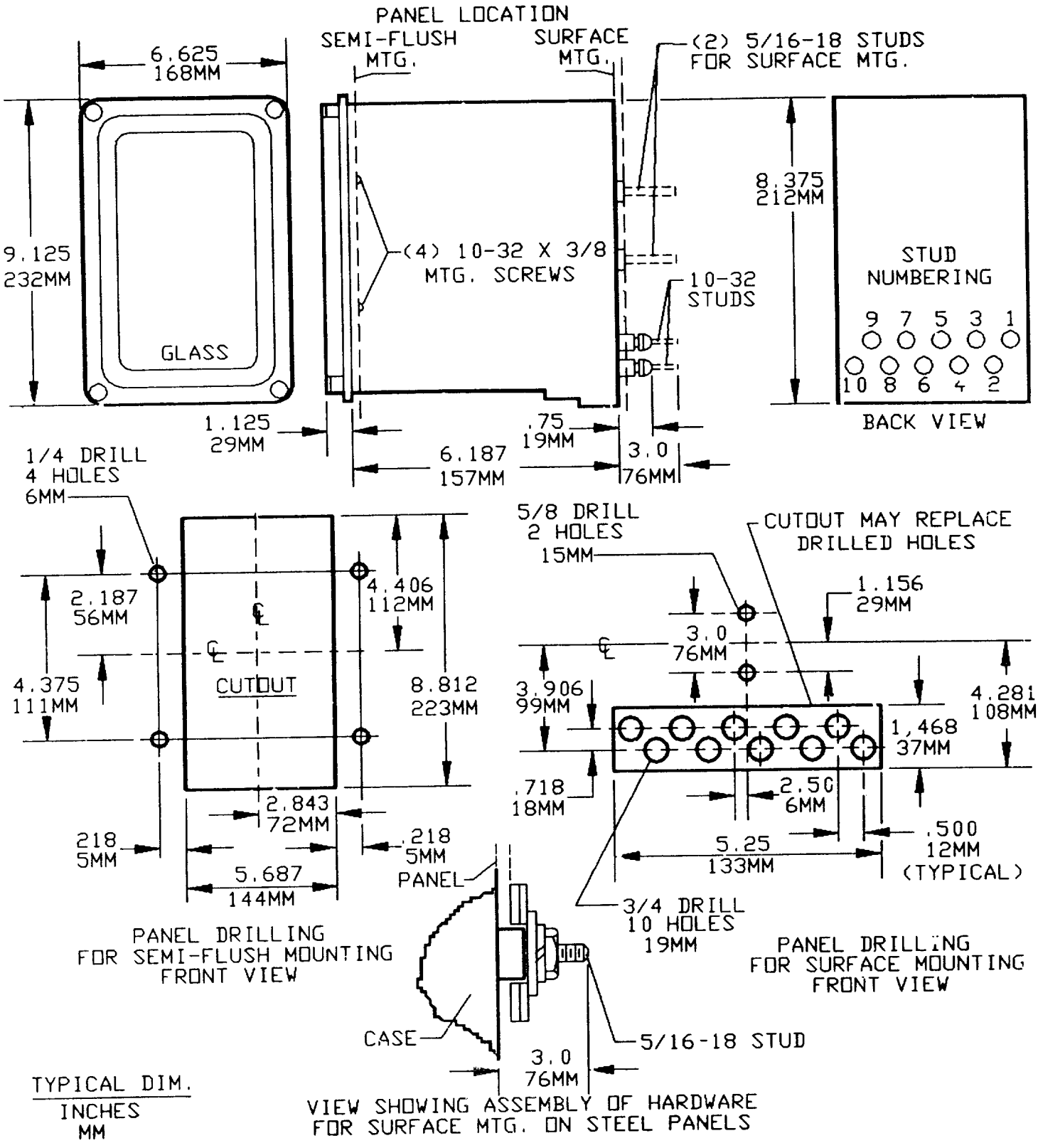


Fig. 20 (K-6209271 [8]) Outline and Panel Drilling Dimensions for Relay Types IAC Relays