GE Power Management

DIAC / DIFC / DSFC

DIGITAL OVERCURRENT PROTECTION

Instruction Manual

Manual P/N: GEK-105570C

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Note: All relays must be powered up at least once per year to avoid deterioration of electrolytic capacitors and subsequent relay failure.

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ISO9000 REGISTERED

Manufactured under an ISO9002 Registered system.

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Cover Photo: 8919670

LIST OF FIGURES

These Instructions do not purport to cover all details or variations in equipment nor provide for every possible contingency to be met in connection with the installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, the matter should be referred to the GENERAL ELECTRIC COMPANY. To the extent required the product described herein meets applicable ANSI, IEEE, NEMA, and IEC standards; but no assurances are given with respect to local codes and ordinances because they vary greatly

INTRODUCTION

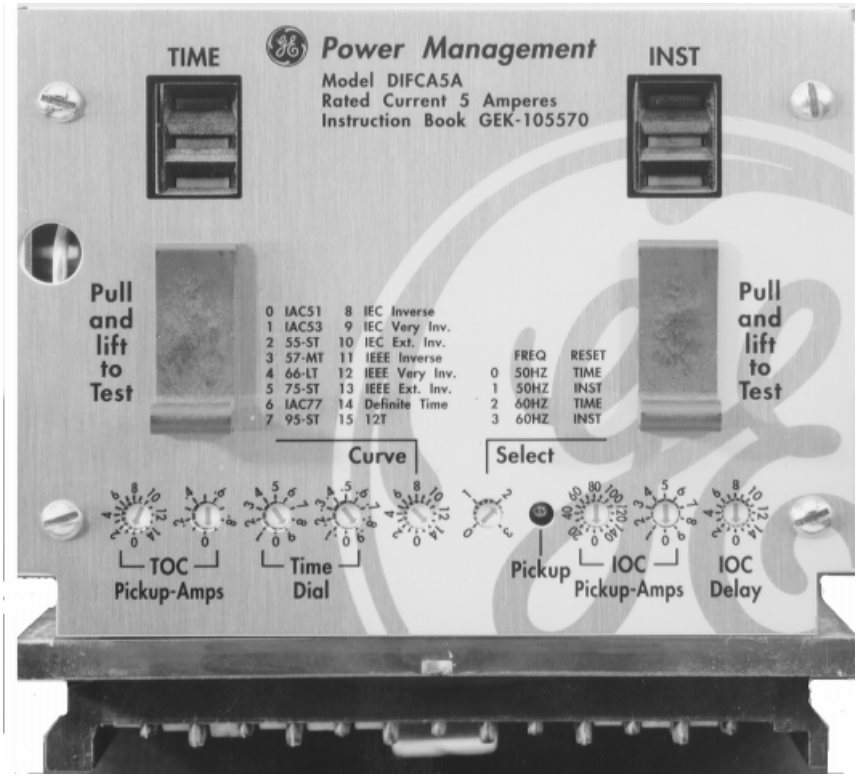
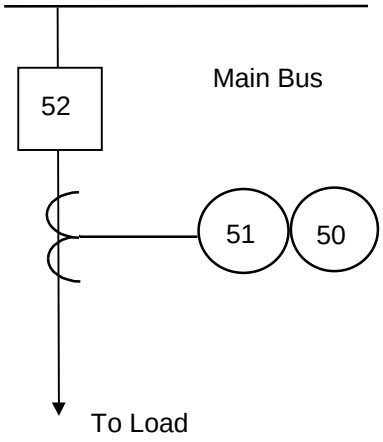


Figure 0: Front View DIFC (8919654)

FEATURES

- **Digital single Phase overcurrent protection**
- **General-purpose feeder protection**
- **50 / 51 applications**
- **Self-powered**
- **16 Selectable curves**
- **Reset curve enable/disable**
- **Low Burden**
- **Fully Retrofitable ***
- **Functional separate TOC and IOC operations.**
- **Wide settings range.**
- **Drawout case construction**



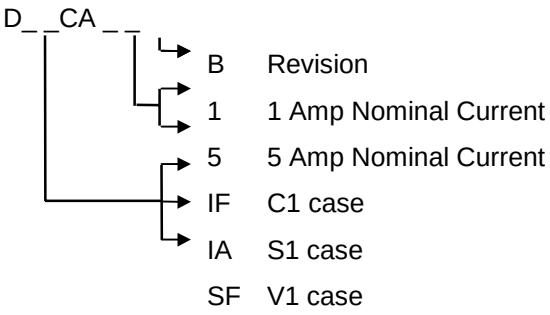
***** When replacing unit and case (see instruction manual INSTALLATION section for details).

PRODUCT DESCRIPTION

General

The DIAC, DIFC and DSFC are a family of self-powered, single-phase, digital overcurrent relays. The DIAC is packaged in a GE S1 style case, the DIFC is packaged in a GE C1 style case and the DSFC is packaged in a GE V1 style case. See the HARDWARE DESCRIPTION section for mounting dimensions.

The table below gives the model number breakdown.



These relays use waveform sampling of the current input together with appropriate algorithms to provide a time overcurrent (TOC) and an instantaneous overcurrent (IOC) function.

Application

Time and instantaneous overcurrent functions are widely used in many applications throughout the power system. Typical examples are protection of utility and industrial feeders and short circuit and overload protection for transformers, and motors.

For feeder protection, the usual application requires one relay per phase and a fourth relay connected in the residual circuit of three 'wye' connected current transformers (CTs). A typical external connection diagram for this application is shown in Figure 18 OR 19. Use of a separate ground relay provides more sensitive protection for ground faults.

The TOC reset characteristics can be set to emulate those of an induction disk or set for fast reset with no intentional delay.

Functions

The TOC function operates on an 'RMS' current calculated from the sampled values. The IOC function operates on the sampled values, and the algorithm virtually eliminates the decaying DC offset component to achieve low transient overreach of less than 7%.

The relays contain two independent settings, one for TOC and one for IOC.

TOC

The TOC function provides 16 selectable time current curves.

- IAC51
- IAC53
- 55-SHORT TIME
- 57-MEDIUM TIME
- 66-LONG TIME
- 75-SHORT TIME
- IAC77
- 95-SHORT TIME
- IEC Inverse
- IEC Very Inverse
- IEC Extremely Inverse
- IEEE Inverse
- IEEE Very Inverse
- IEEE Extremely Inverse
- Definite Time
- I^2T

The IAC51, IAC53 and IAC77 curves match the time current curve of the respective IAC model. This includes the 0.5 through 9.9 time dial setting and for both the 1 and 5 amp units. Numbered curves 55, 57, 66, 75, and 95 match the shape of the respective IAC model however the time dial positions are not one to one equivalents. The IEC, IEEE and I^2t curves are based on the following equations:

NOTE:

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IEC equations are defined by IEC 255-4 and IEEE equations are defined by IEEE PC37.112

••••••••••••••••••••••••••••••••••

In the following equations,

M = multiple of pickup
TD = time dial (0.5, 1, …, 9.9)
t = time (seconds)

IEC Inverse

See Figure 9 for graph of equation

Reset – time

$$t = \left\{ \frac{.97}{M^2 - 1} \right\} TD$$

Pickup – time

$$t = \left\{ \frac{0.014}{M^{0.02} - 1} \right\} TD$$

IEC Very Inverse

See Figure 10 for graph of equation

Reset – time

$$t = \left\{ \frac{4.32}{M^2 - 1} \right\} TD$$

Pickup – time

$$t = \left\{ \frac{1.35}{M^1 - 1} \right\} TD$$

IEC Extremely Inverse

See Figure 11 for graph of equation

Reset – time

$$t = \left\{ \frac{5.82}{M^2 - 1} \right\} TD$$

Pickup – time

$$t = \left\{ \frac{8.0}{M^2 - 1} \right\} TD$$

IEEE Inverse

See Figure 12 for graph of equation

Reset – time

$$t = \left\{ \frac{.97}{M^2 - 1} \right\} TD$$

Pickup – time

$$t = \left\{ \frac{.0103}{M^{0.02} - 1} + 0.0228 \right\} TD$$

IEEE Very Inverse

See Figure 13 for graph of equation

Reset – time

$$t = \left\{ \frac{4.32}{M^2 - 1} \right\} TD$$

Pickup – time

$$t = \left\{ \frac{3.922}{M^2 - 1} + 0.0982 \right\} TD$$

IEEE Extremely Inverse

See Figure 14 for graph of equation

Reset – time

$$t = \left\{ \frac{5.82}{M^2 - 1} \right\} TD$$

Pickup – time

$$t = \left\{ \frac{5.64}{M^2 - 1} + 0.02434 \right\} TD$$

I^2T

See Figure 16 for graph of equation

Reset – time

$$t = \left\{ \frac{2}{M^2} \right\} TD$$

Pickup – time

$$t = \left\{ \frac{250}{M^2} \right\} TD$$

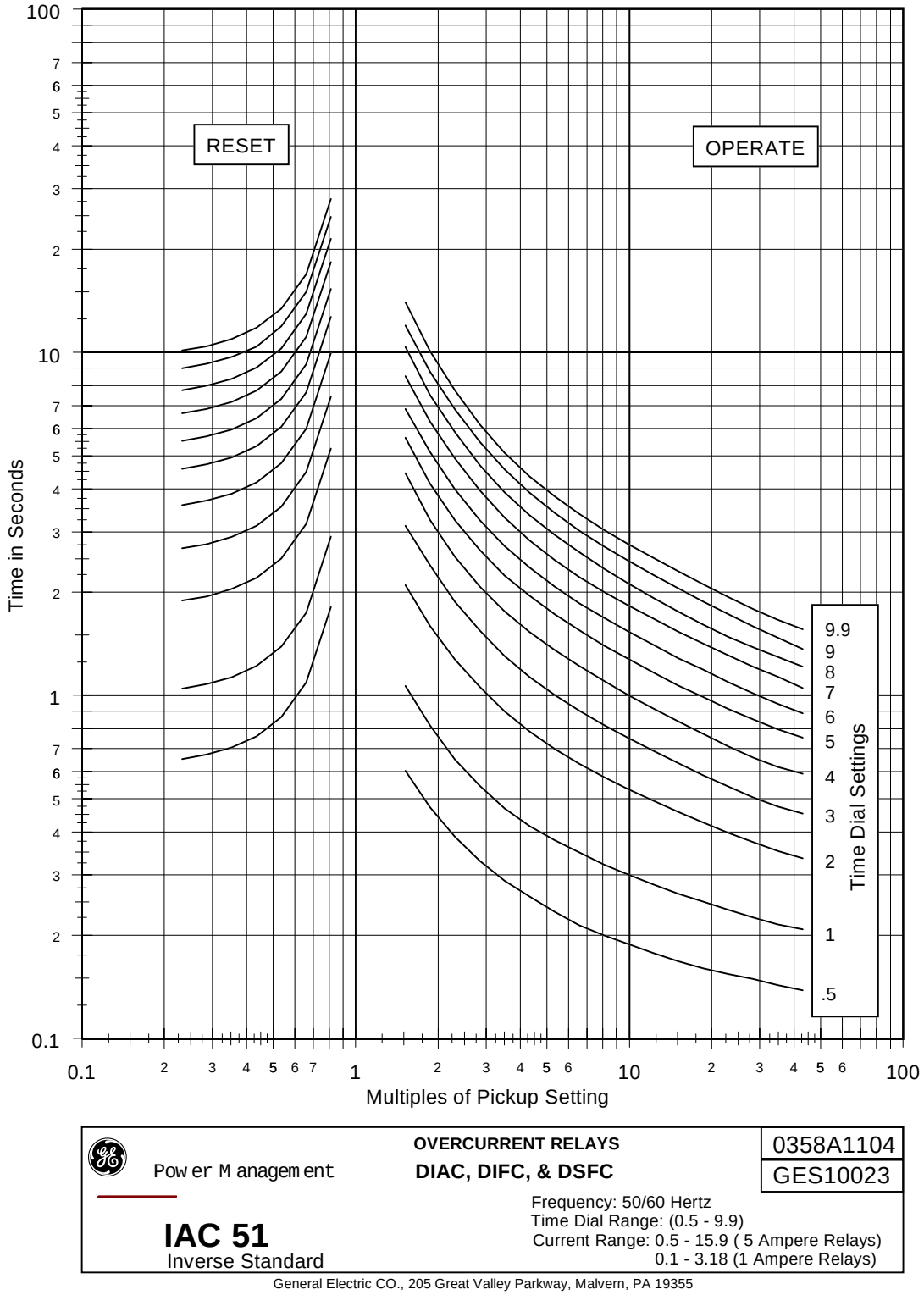


Figure 1: IAC51 TOC Curve

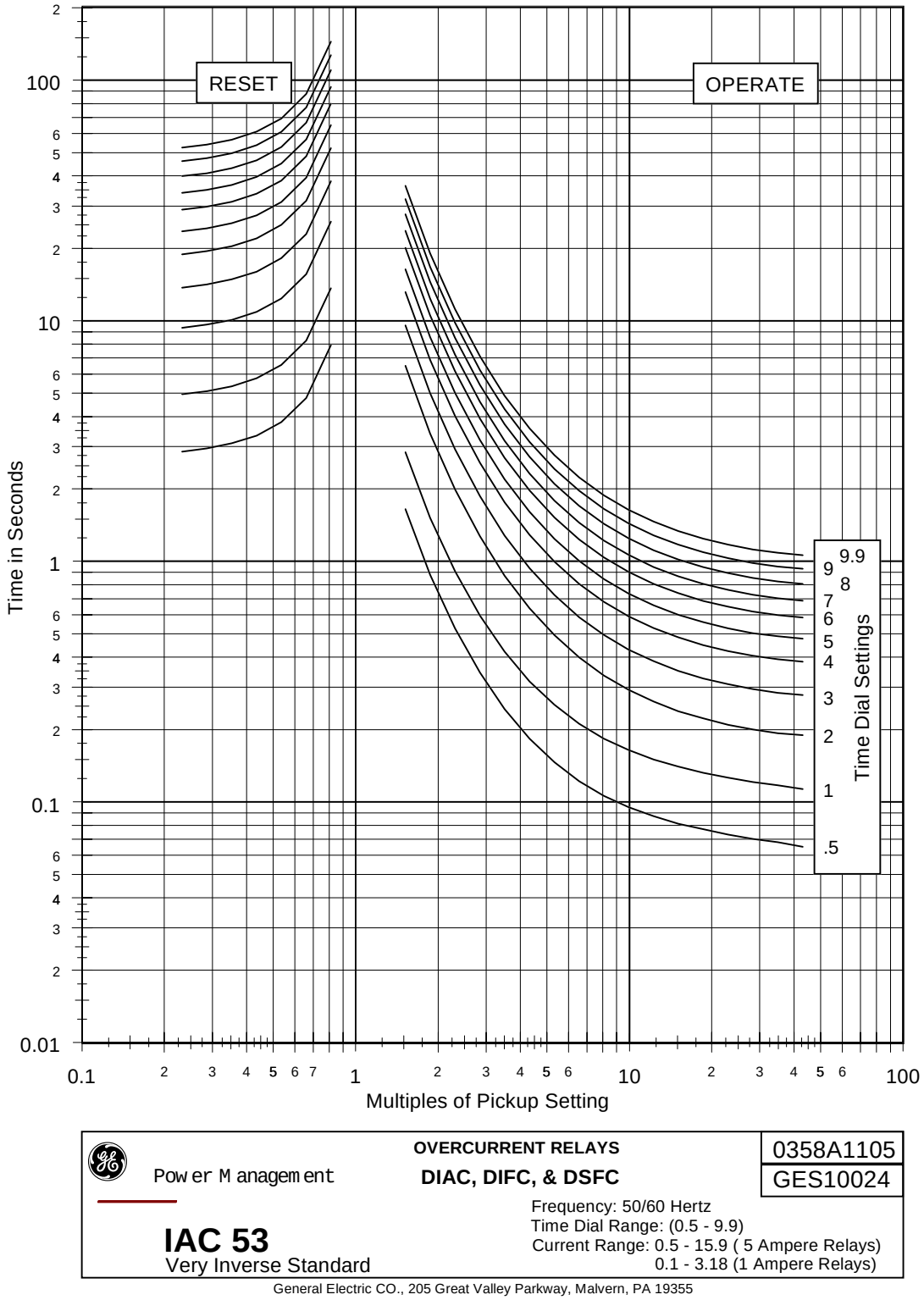


Figure 2: IAC53 TOC Curves

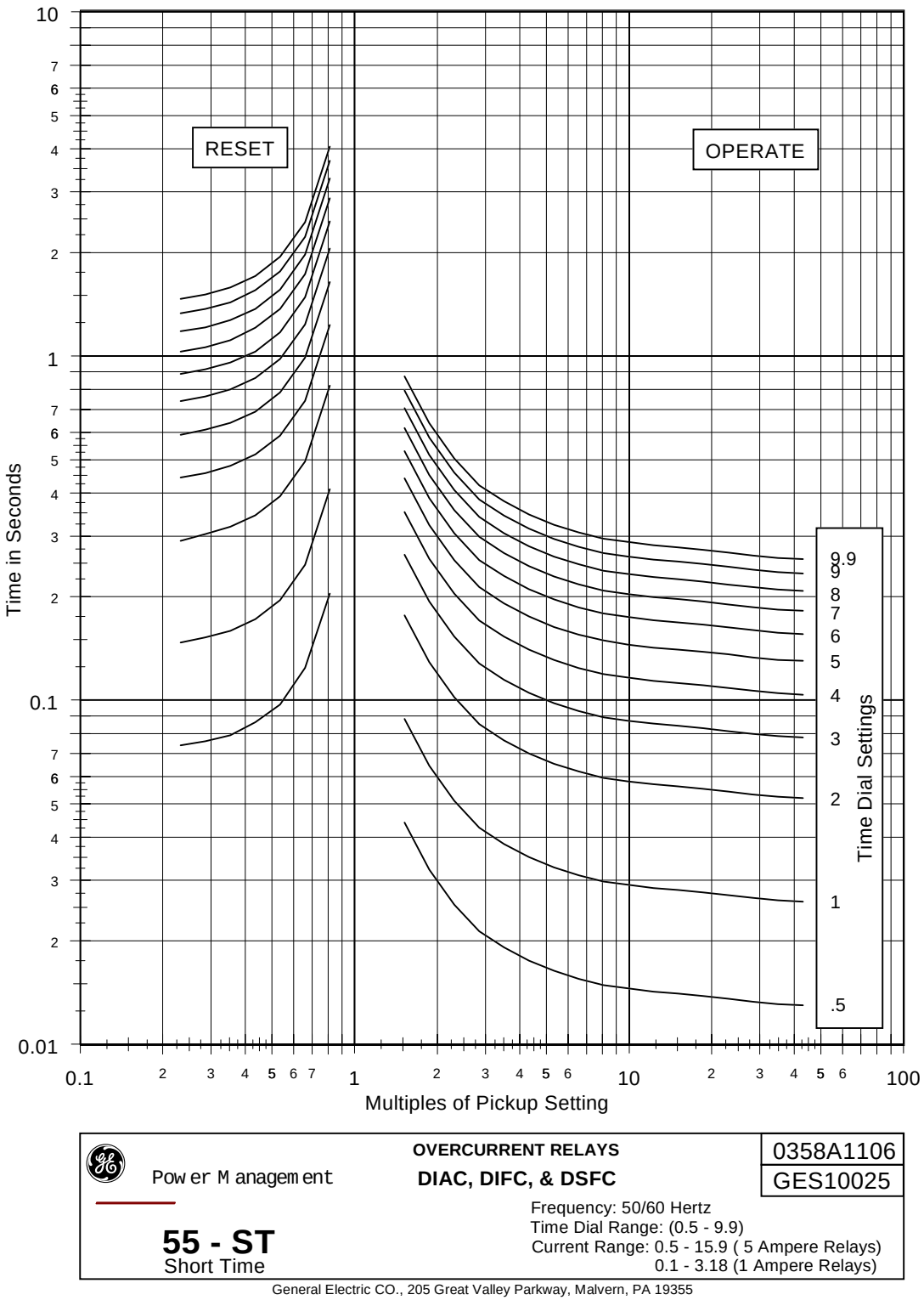


Figure 3: 55 Short Time TOC Curves

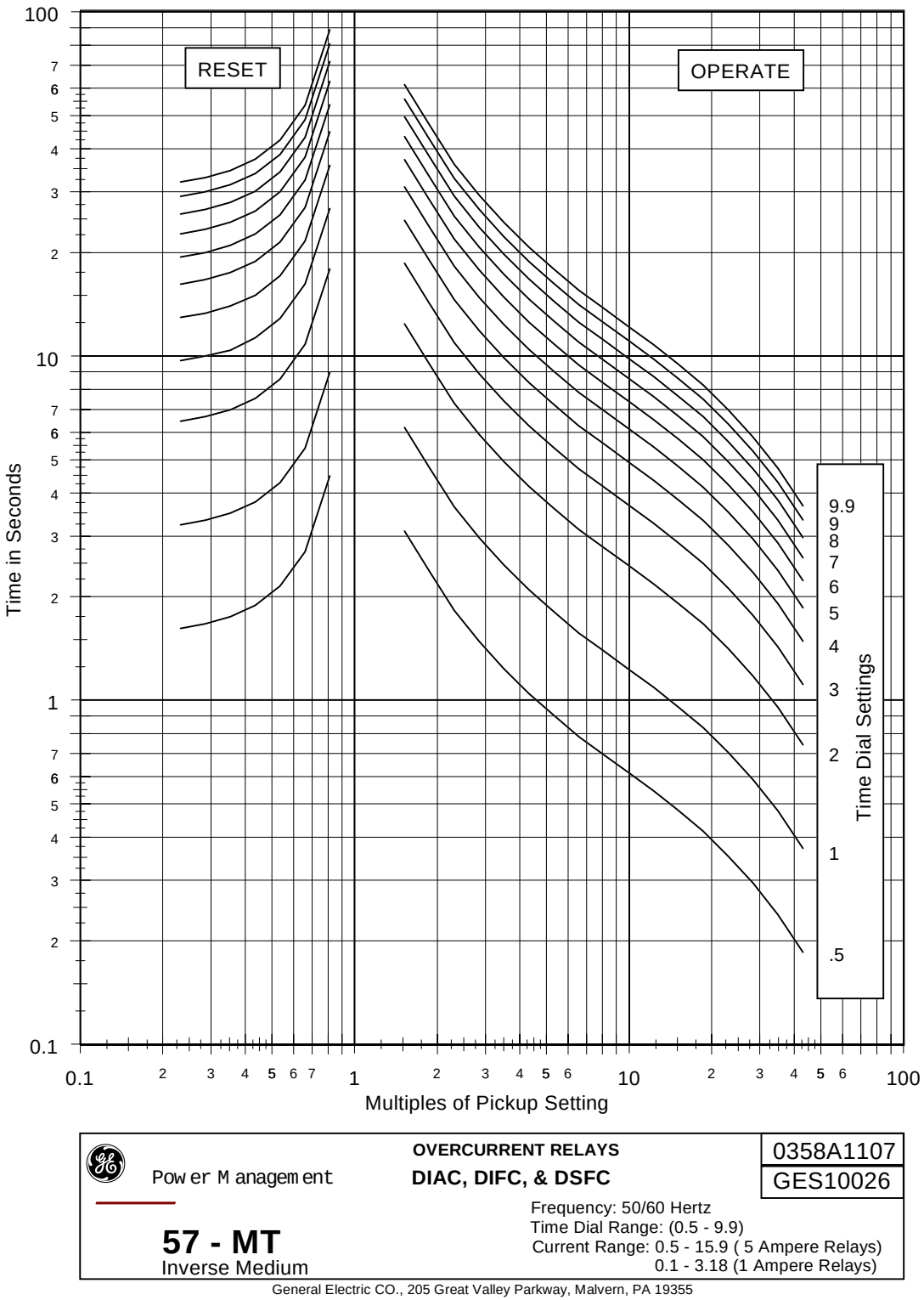


Figure 4: 57 Medium Time TOC Curves

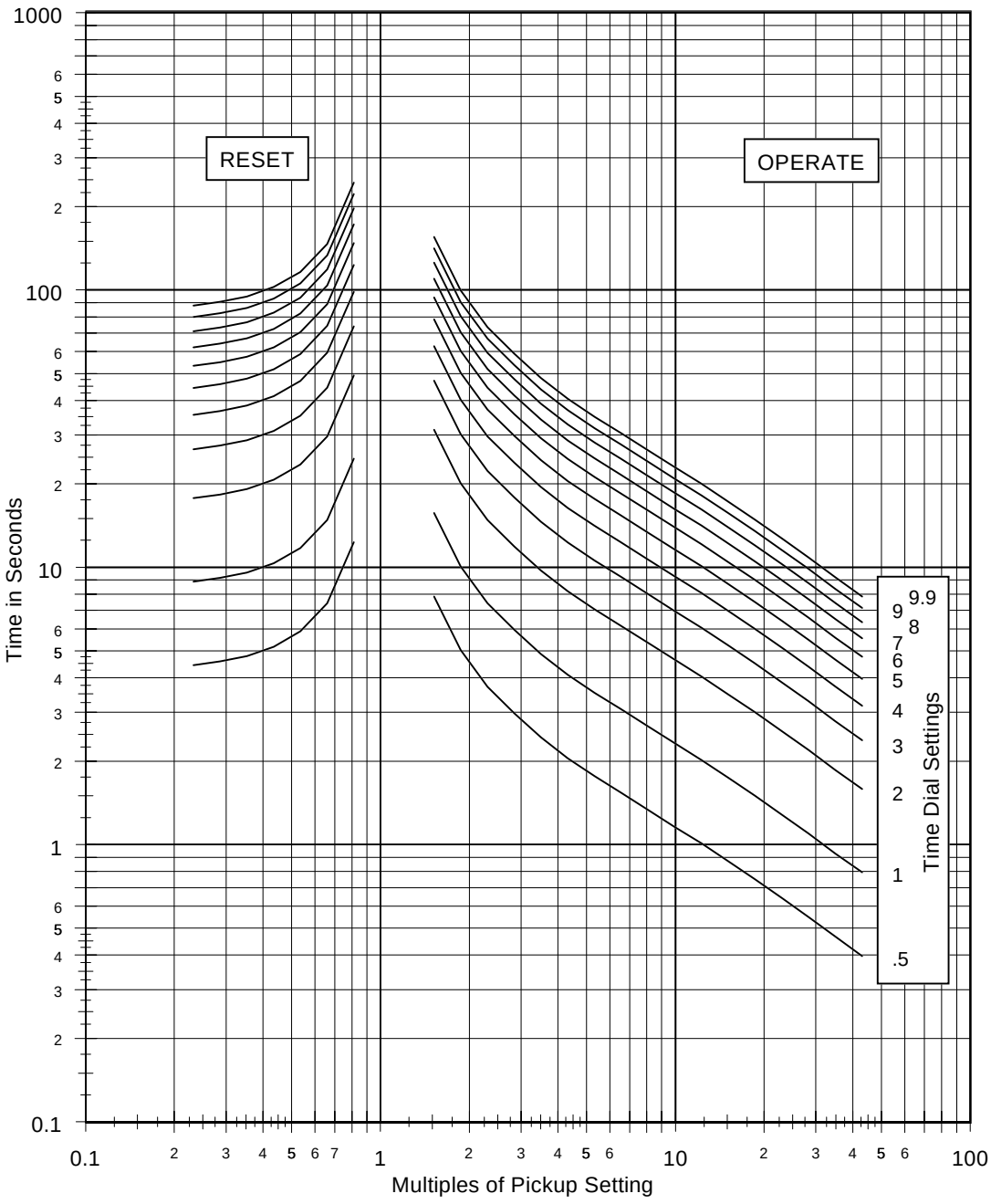


Figure 5: 66 Long Time TOC Curves

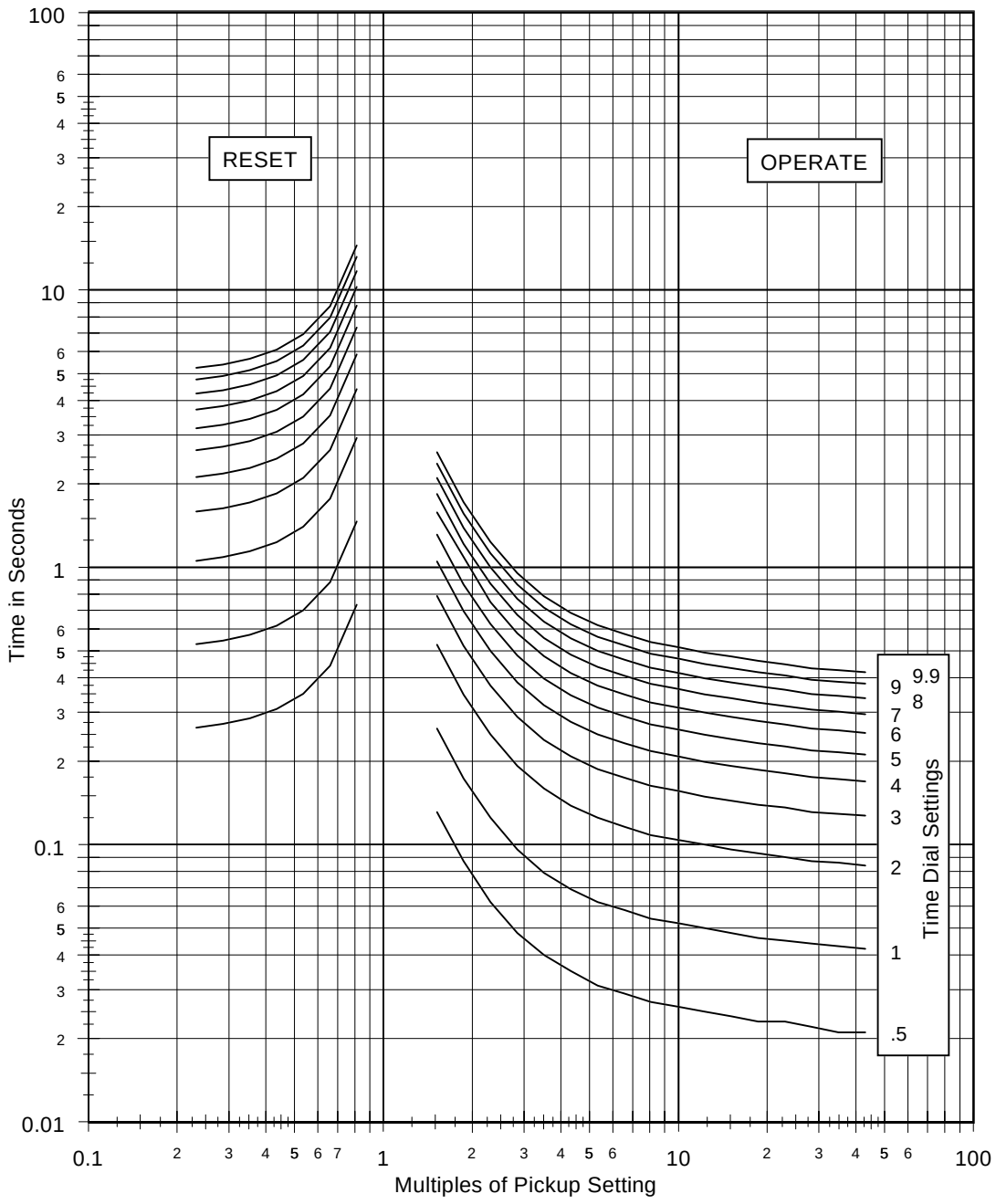


Figure 6: 75 Short Time TOC Curves

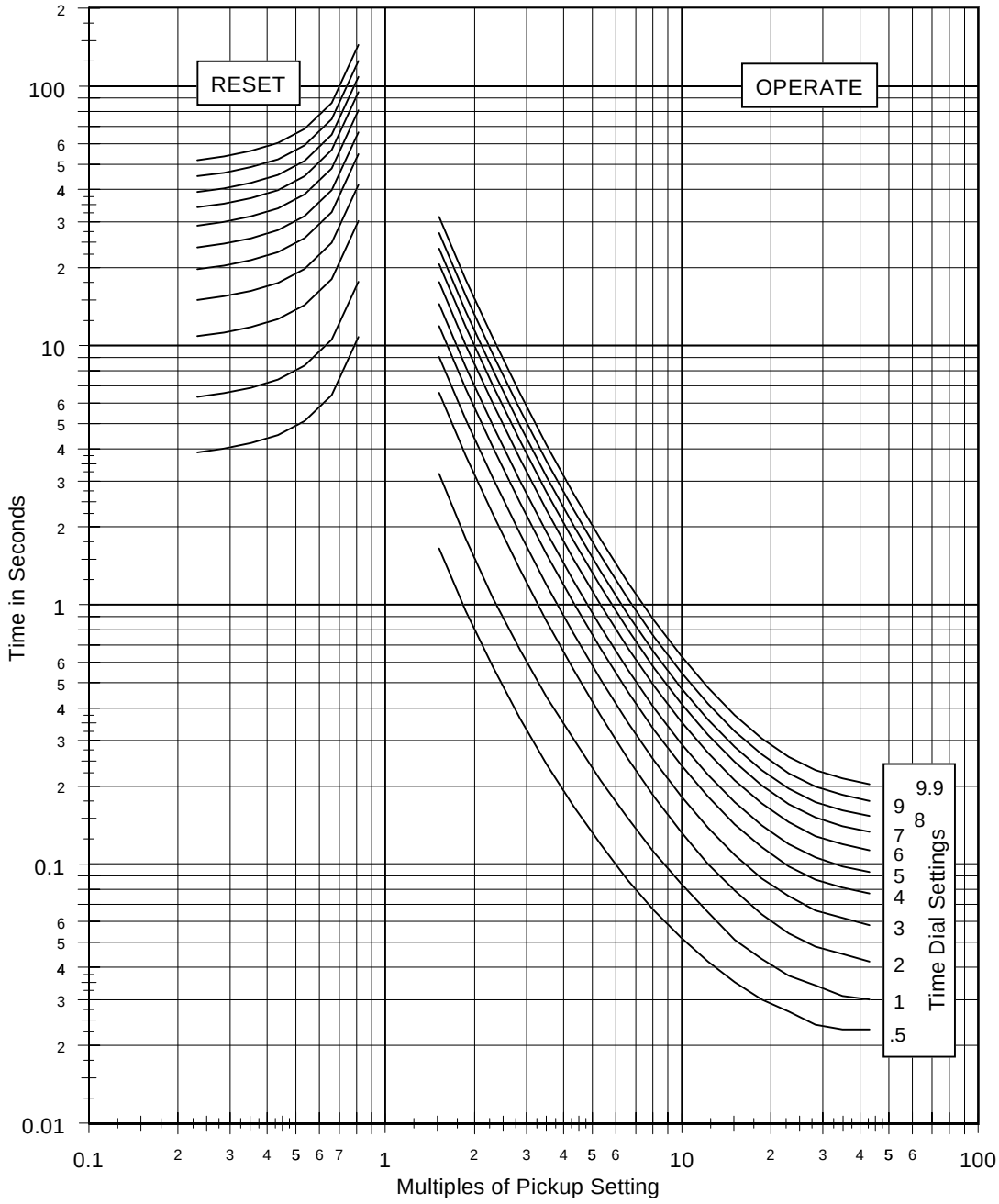


Figure 7: IAC77 TOC Curves

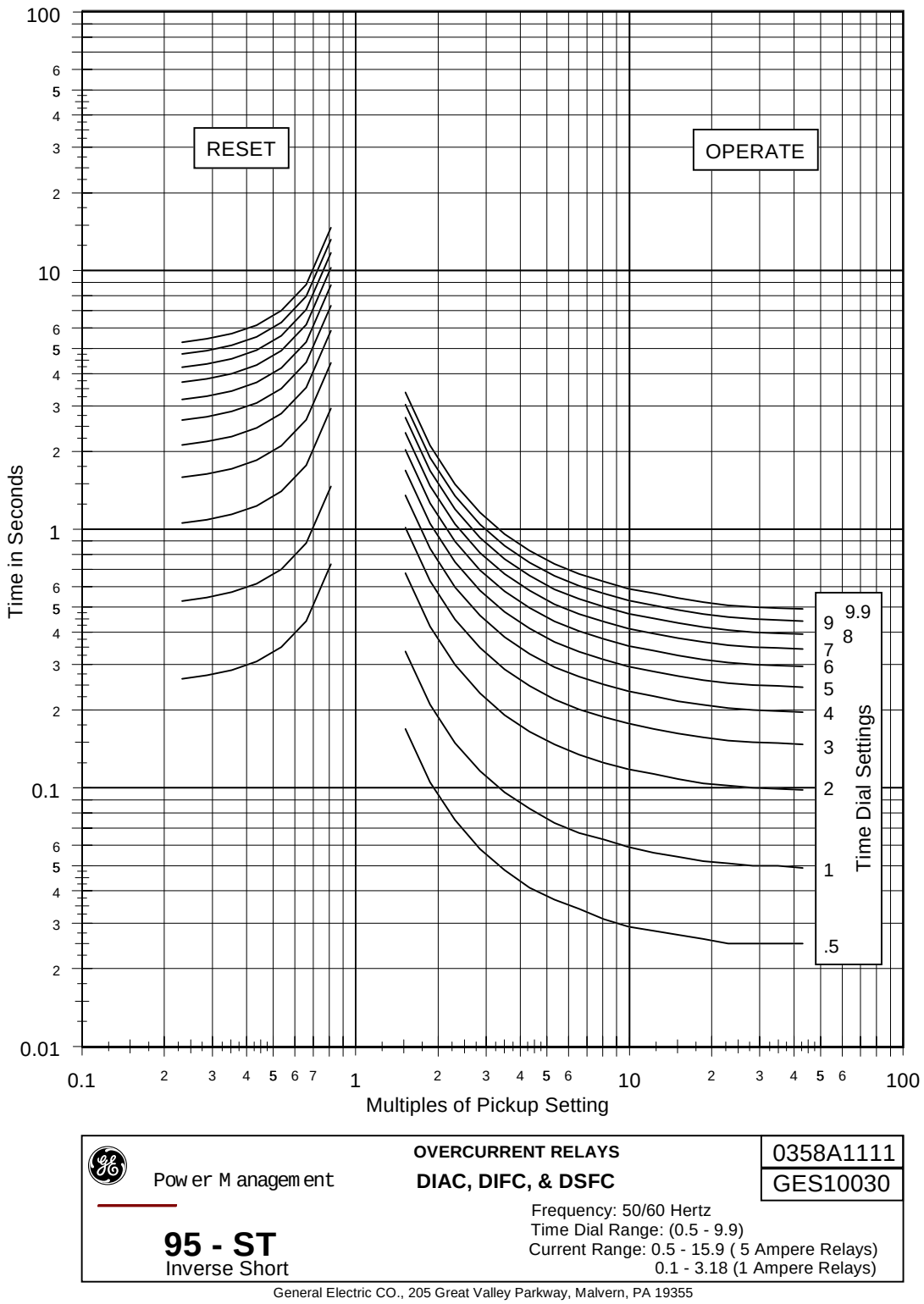
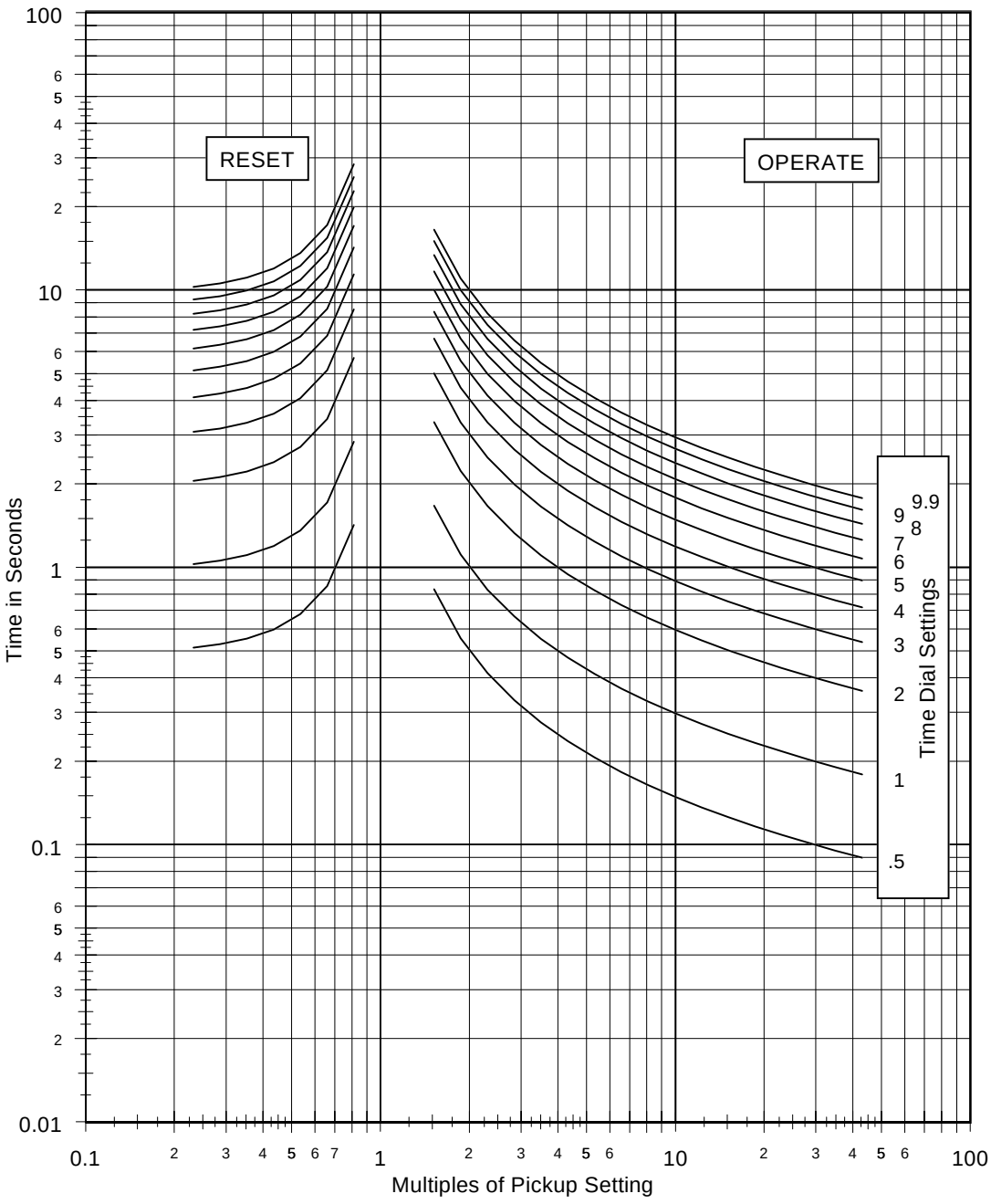


Figure 8: 95 Short Time TOC Curves



Power Management

OVERCURRENT RELAYS

DIAC, DIFC, & DSFC

0358A1112

GES10031

IEC Inverse

Frequency: 50/60 Hertz
Time Dial Range: (0.5 - 9.9)
Current Range: 0.5 - 15.9 (5 Ampere Relays)
0.1 - 3.18 (1 Ampere Relays)

General Electric CO., 205 Great Valley Parkway, Malvern, PA 19355

Figure 9: IEC Inverse TOC Curves

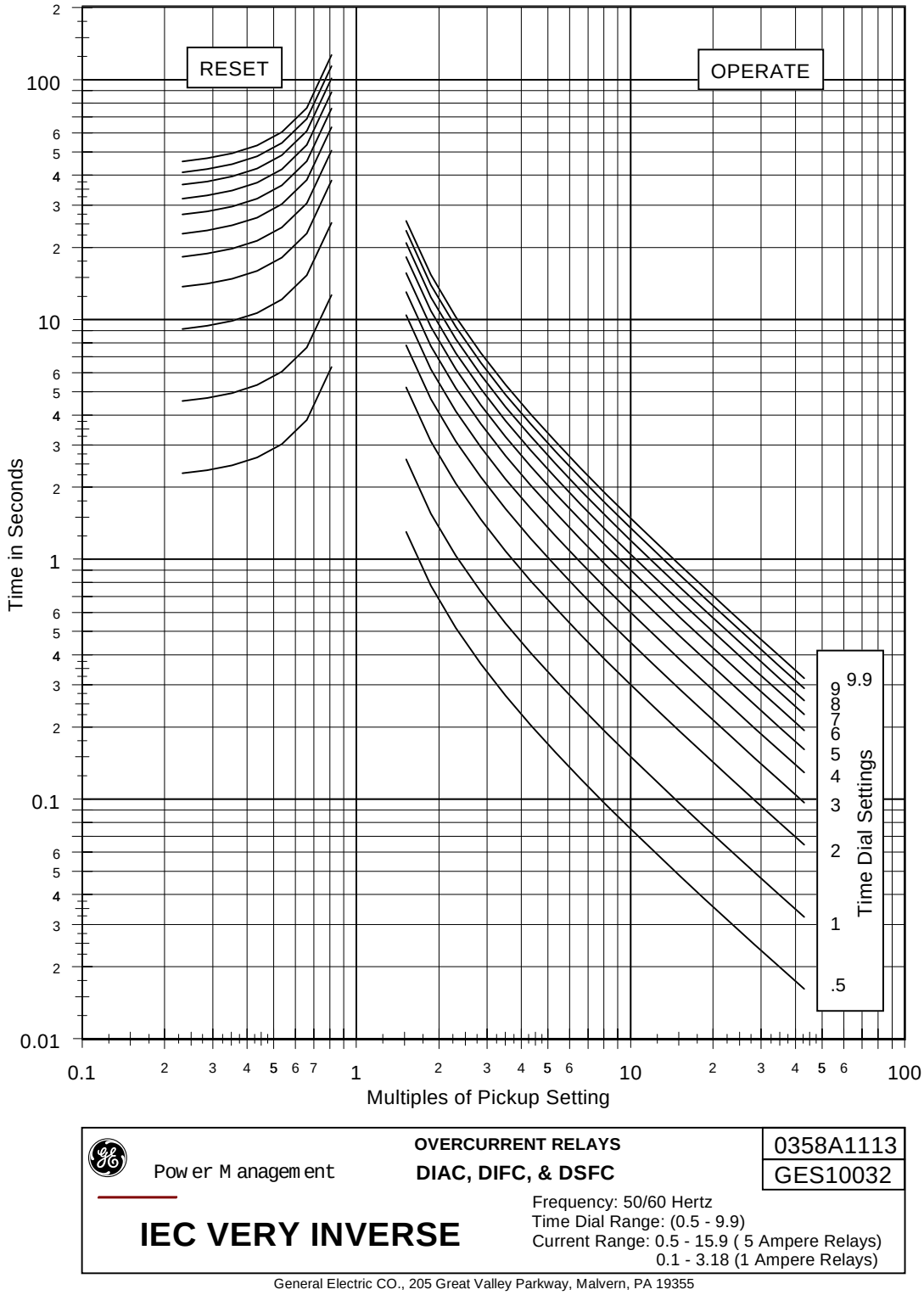


Figure 10: IEC Very Inverse TOC Curves

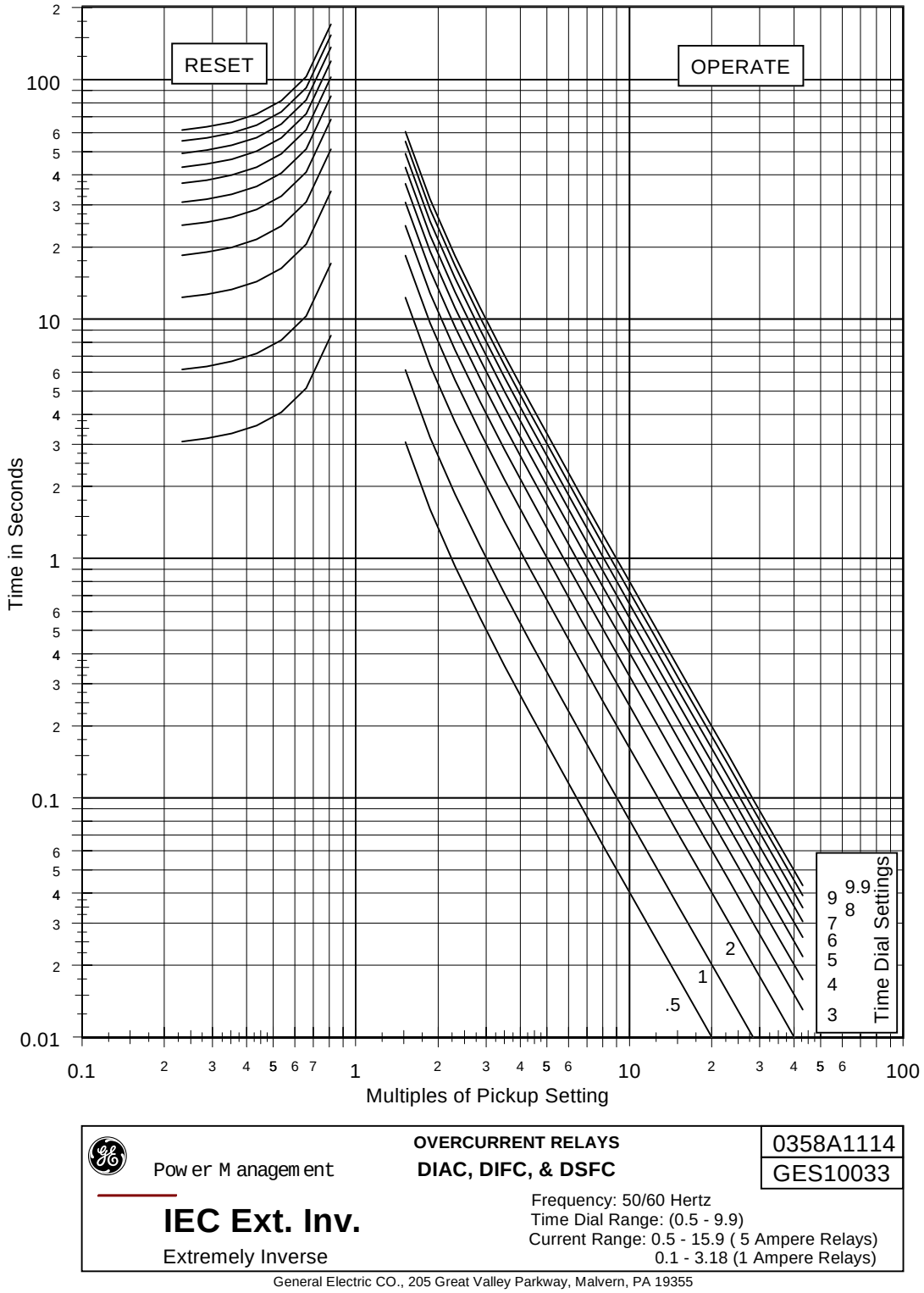


Figure 11: IEC Extremely Inverse TOC Curves

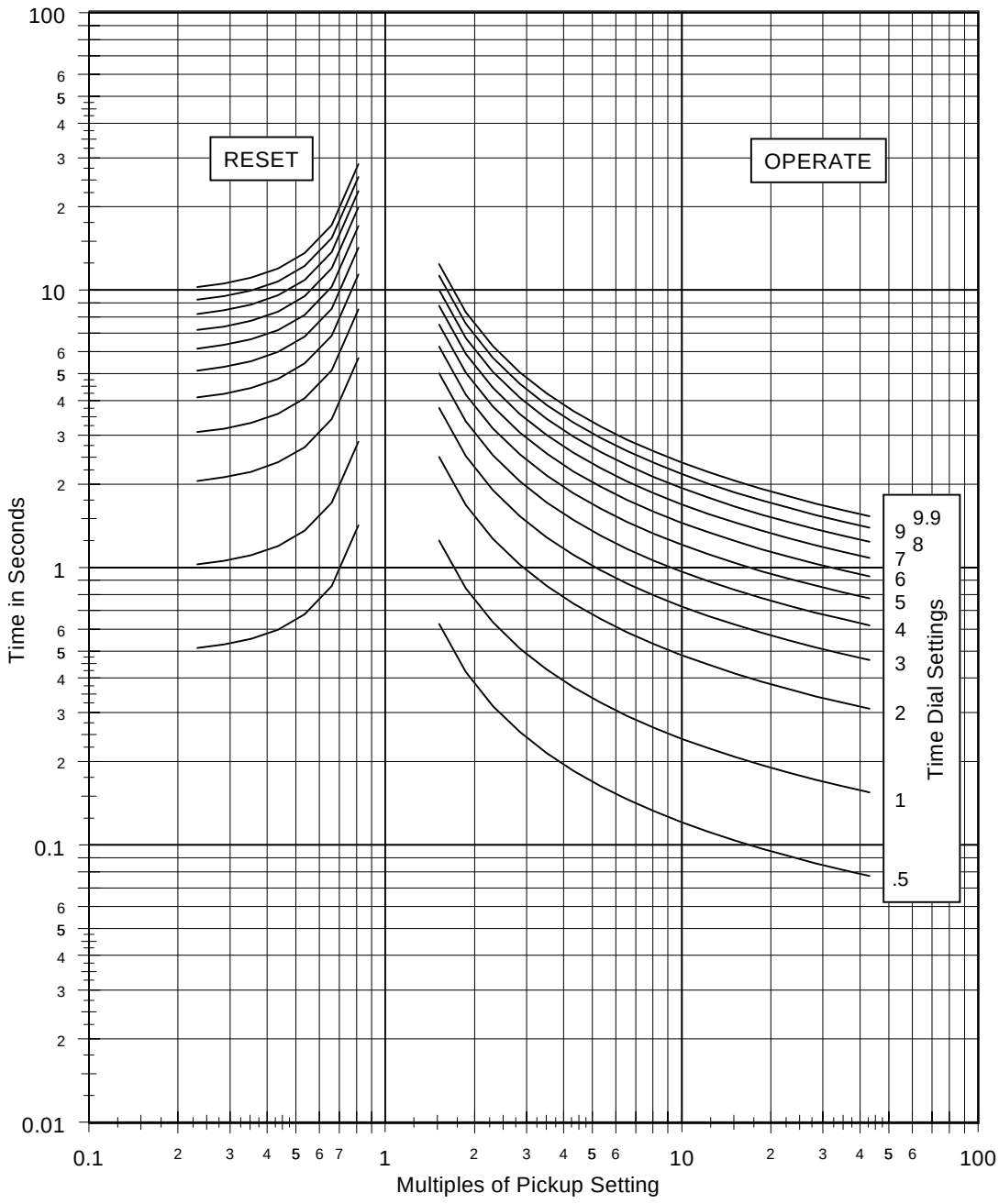


Figure 12: IEEE Inverse TOC Curves

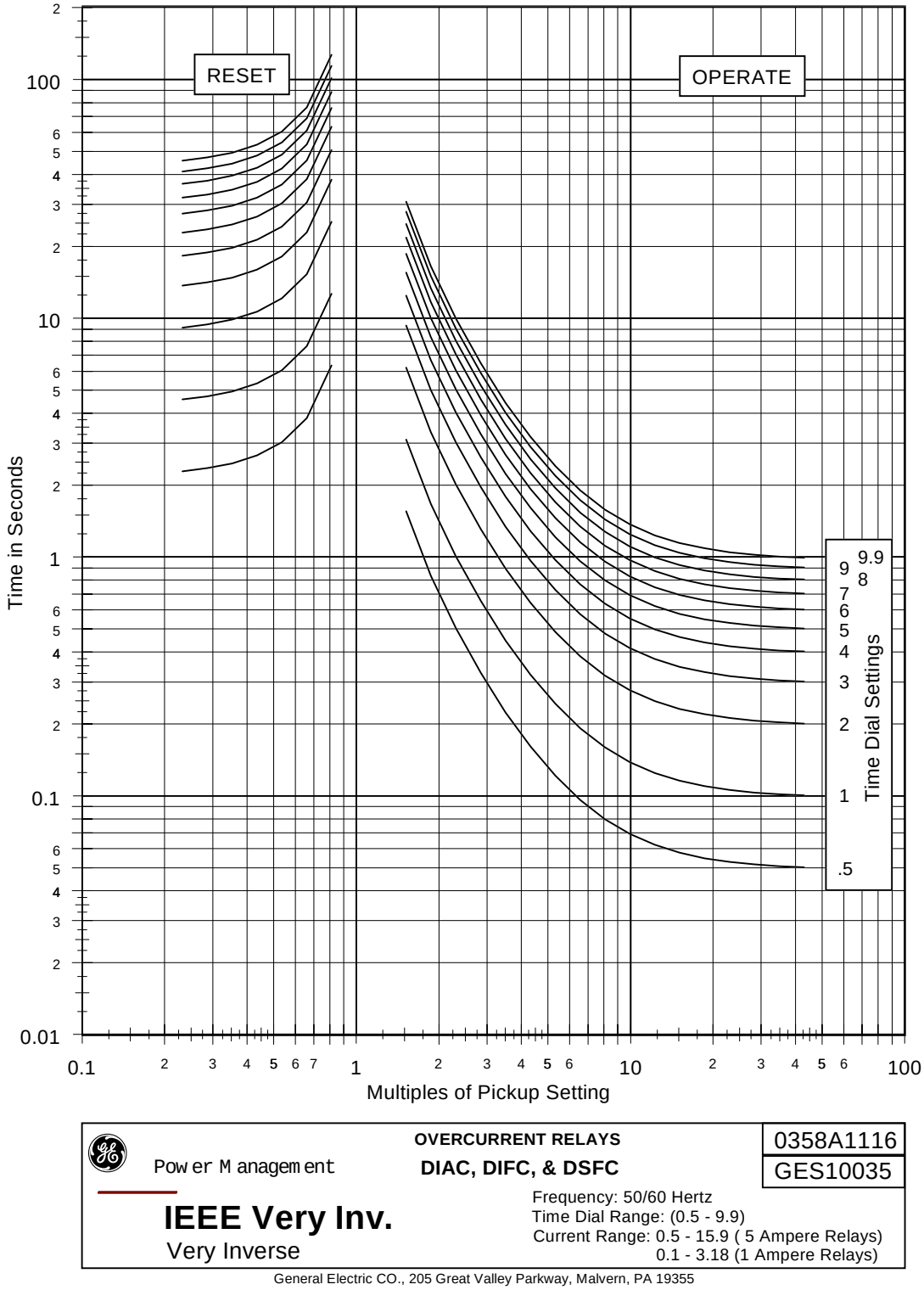


Figure 13: IEEE Very Inverse TOC Curves

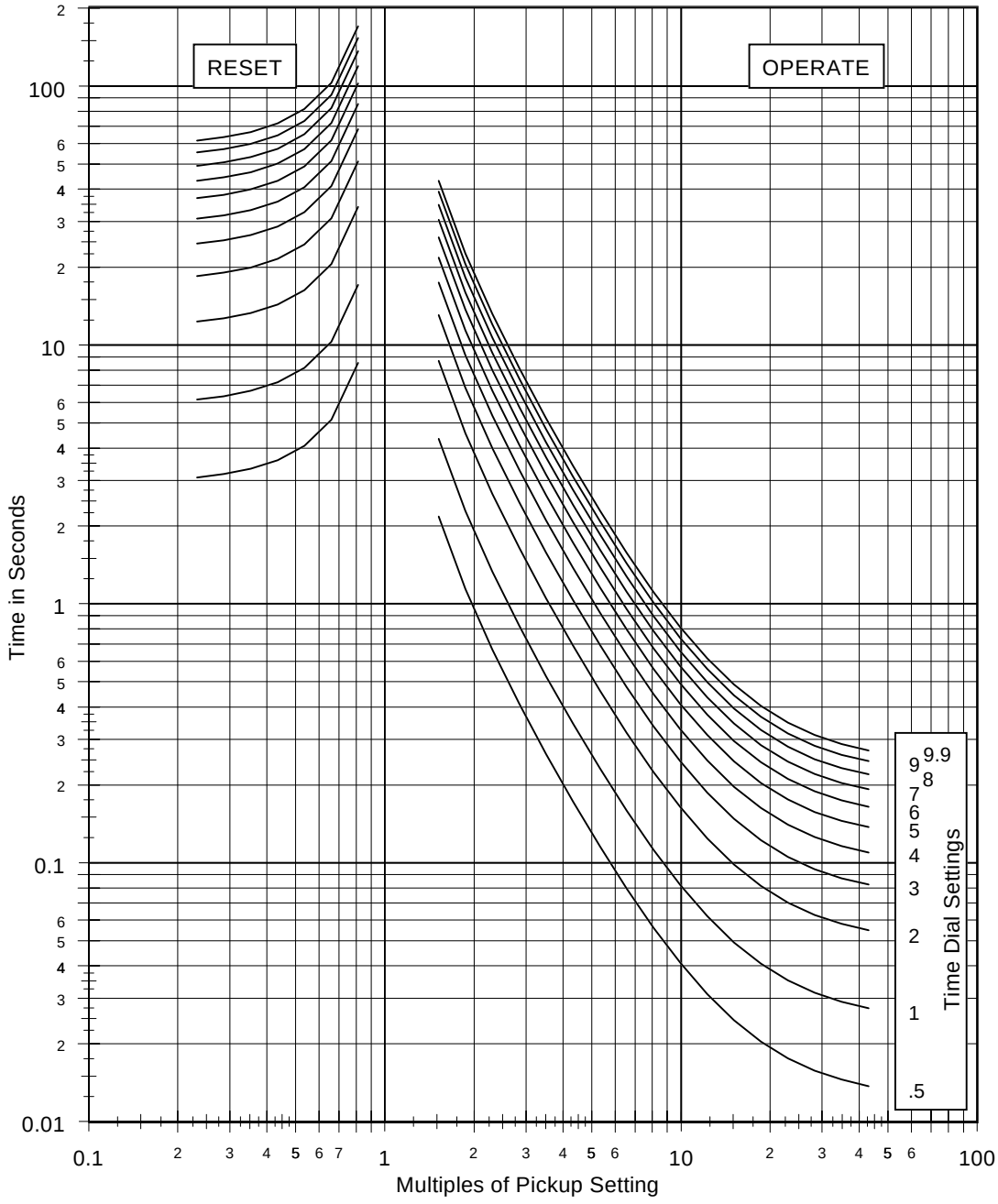


Figure 14: IEEE Extremely Inverse TOC Curves

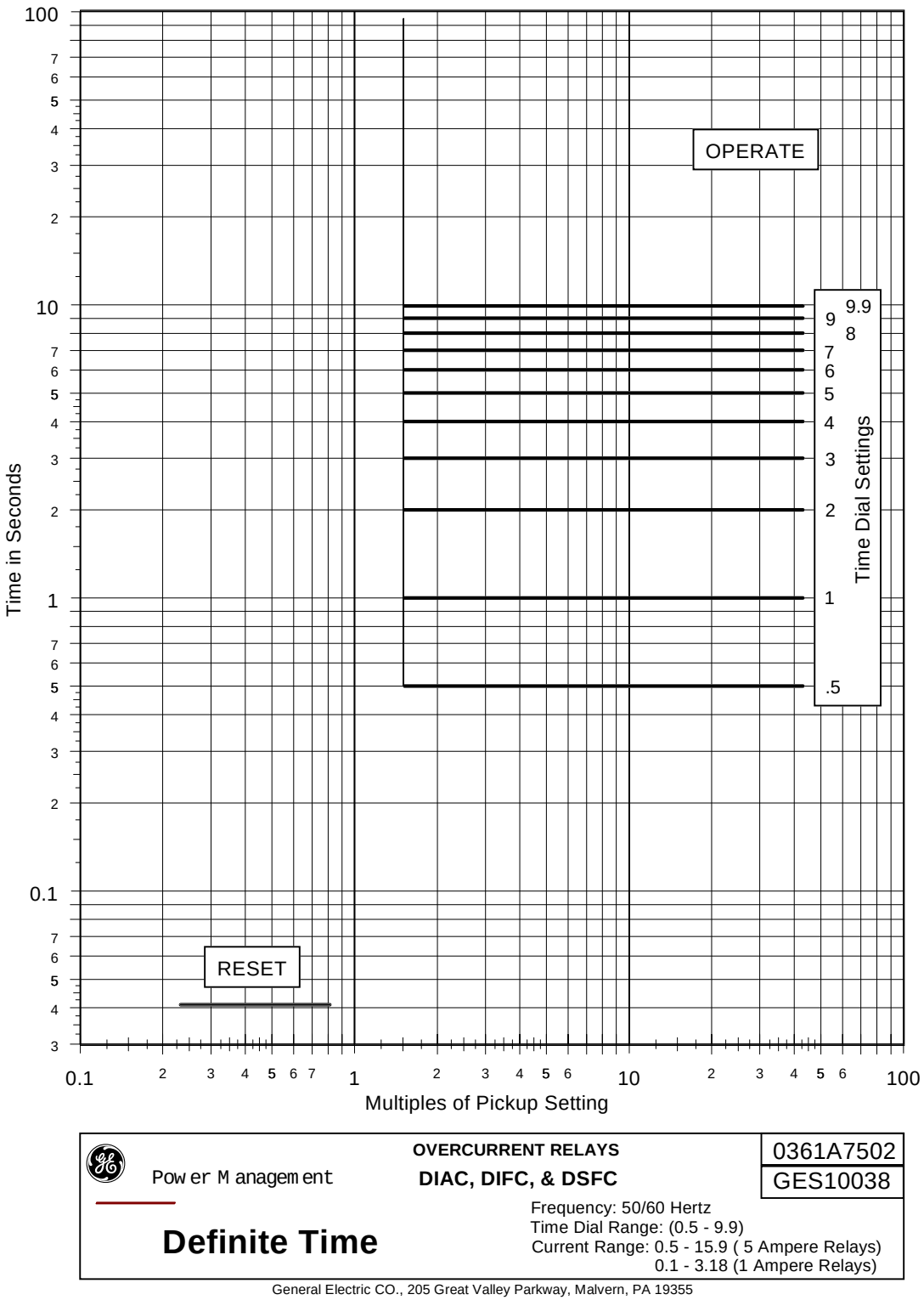


Figure 15: Definite Time

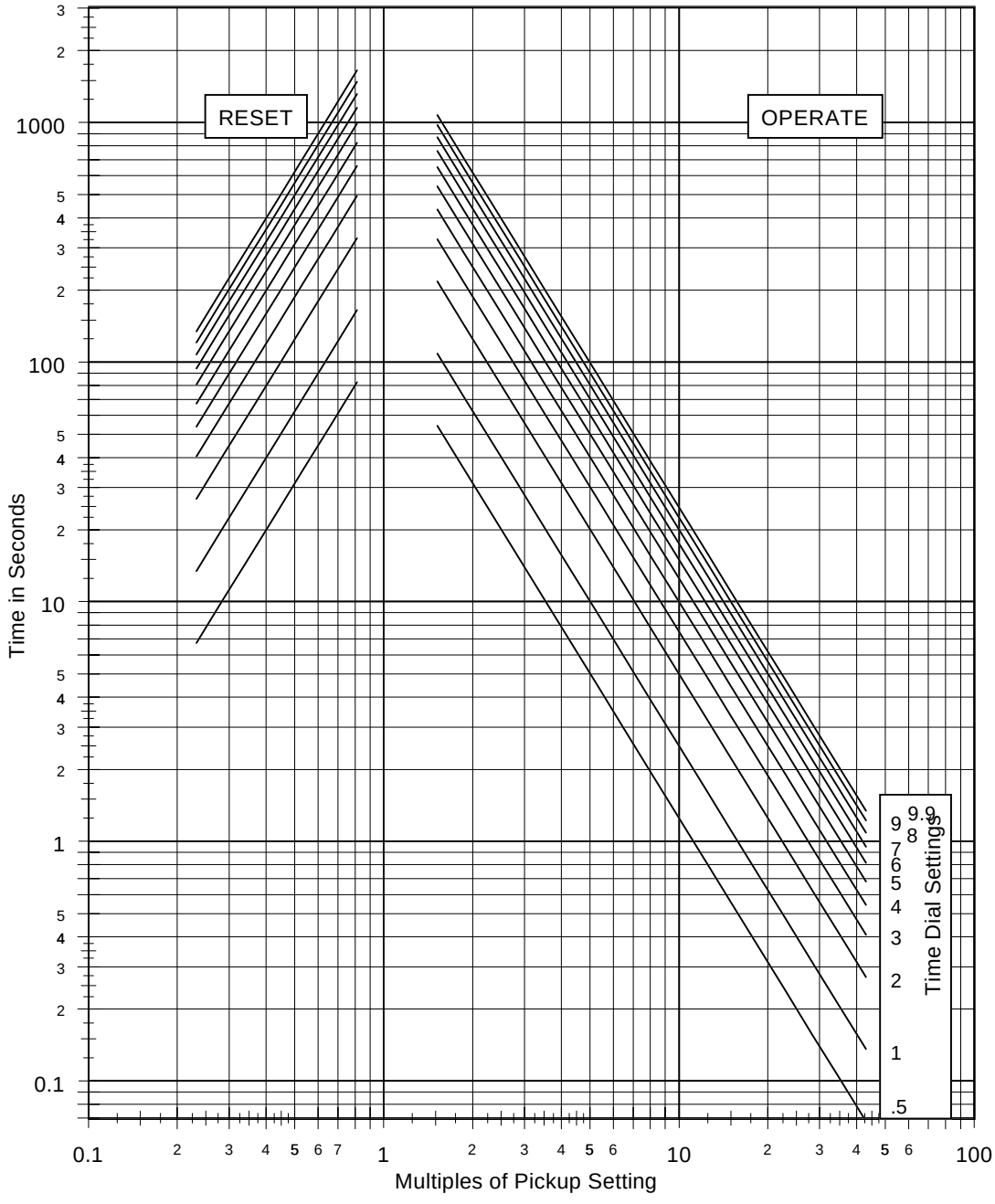


Figure 16: I^2t Time Curve

The I^2T curve has a K value equal to the time dial times 250. The minimum value of K is 25 (0.1 times 250) and the maximum value is 2475 (9.9 times 250).

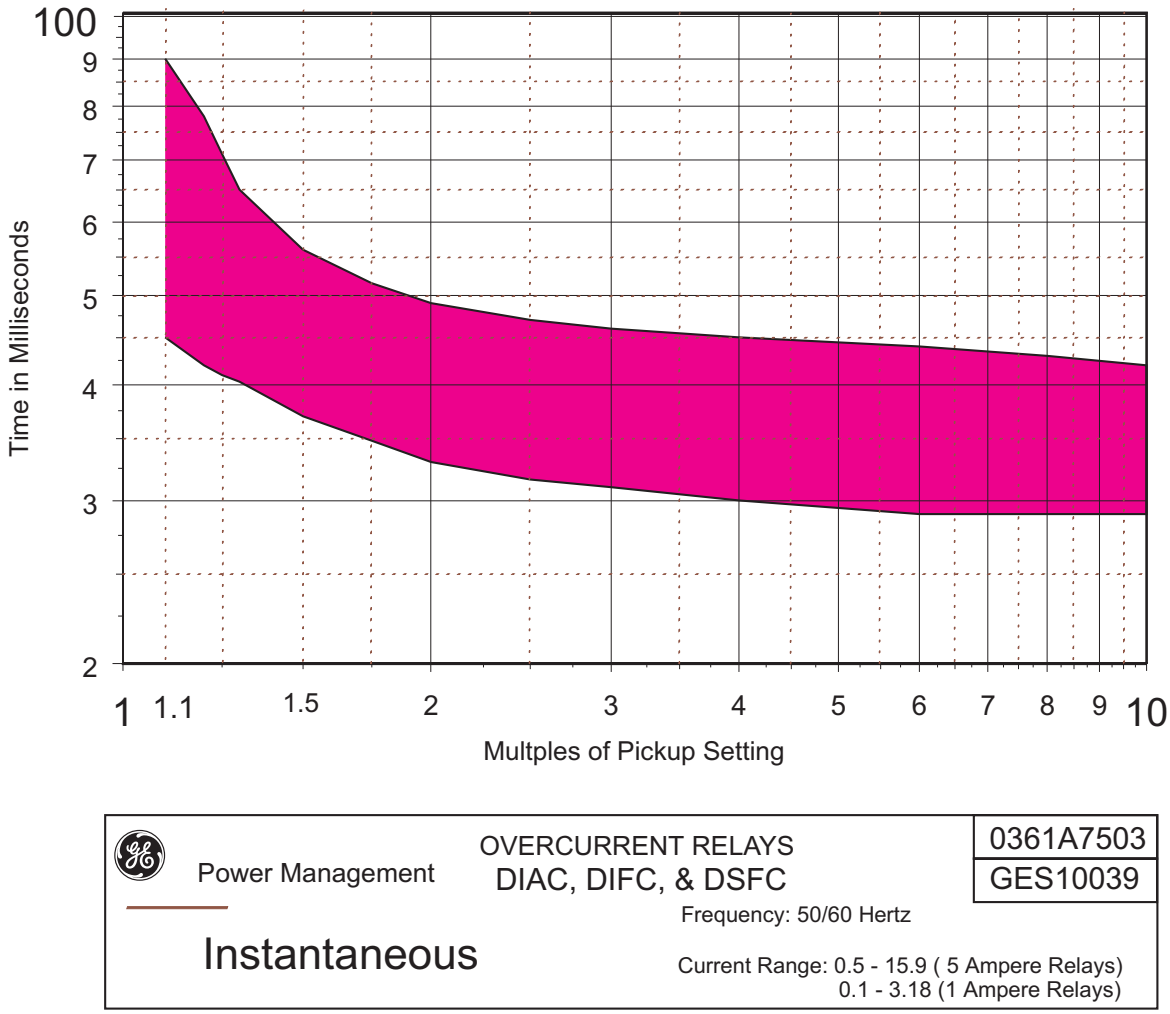


Figure 17: IOC Curve

CALCULATION OF SETTINGS

When replacing IAC, IFC or SFC relays, review the time current curves of the digital relays to verify that they conform to the relays being replaced. In some cases it may be necessary to redo the coordination study to assure coordination with other devices.

The base time of the Definite Time Curve is 1 second. The base time is multiplied by the time dial to provide the actual operating time. The default or lowest time dial setting for the Definite Time Curve is 0.1.

The I^2T curve has a K value of 250 @ time dial of 1. The range is from 25 to 2475 in steps of 25 set by the time dial. The default or lowest time dial setting for the I^2T curve is 0.1.

TOC pickup is settable from 0.5 to 15.9 amps in 0.1 amp increments for the 5 amp model, and 0.1 to 3.18 amps in 0.02 amp increments for the 1 amp model, a setting of 0 disables the TOC element. The time dial can be set from 0.5 to 9.9 in 0.1 increments on both the 5 amp model and the 1 amp model. The only exception is for the Definite Time and I2T curves where 0.1 is the minimum value.

The IOC function is settable from 1 to 159 amps in 1 amp increments for the 5 amp model, and 0.2 to 31.8 amps in increments of 0.2 amps for the 1 amp model. Setting the pickup to 0 disables the IOC element. Both models have an IOC delay adjustment from 50 to 400 milliseconds in 25 millisecond steps.

The formula: IOC delay in milliseconds = DS x 25 + 25, where DS is setting on IOC delay dial.

The TOC reset characteristic can be controlled from the front panel. The TOC reset can be set to “timed reset” which emulates the characteristic of an induction disk relay, or “instantaneous reset” where the reset is fixed at 40 to 50 milliseconds.

The system frequency can be set for 50 or 60 Hz controlled from the front panel.

HARDWARE DESCRIPTION

Case

DIAC and DSFC

The DIAC and DSFC relays consist of a case, cover, support structure, and a connection plug to make up the electrical connection. The case is shown in Figures 20 and 22. The external connections are shown in Figure 18. It has 10 connection points and a CT shorting bar. As the connection plug is withdrawn the trip circuit is broken prior to the current shorting bar engagement. The window provides visual indication of the CT shorting.

DIFC

The DIFC relays consist of a molded case, cover, support structure, and a connection plug to make up the electrical connection. The case is shown in Figures 20 and 21. The external connections are shown in Figure 19. It has 14 connection points and a visible CT shorting bar. As the connection plug is withdrawn the trip circuit is broken prior to the current shorting bar engagement. The window provides visual indication of the CT shorting.

Adjustments

All customer settings are accessible from the front of the relay. The cover must be removed to gain access to the settings. The cover has provisions for a sealing “wire.” The settings are left to right, pickup current level for the time element, time dial, curve selection, frequency / reset time, pickup current level for the instantaneous element, and the instantaneous element time delay. The settings are all calibrated and are set by turning the rotary switch to the desired value. The switches are recessed; a small screwdriver is required to make the adjustment.

The relay may be supplied with one of three pointer styles as shown. The color is the color of the indicator, note the arrow location, all switches are shown in the 9:00 position.

The TOC pickup current is set directly in Amps with two rotary switches. An arrow is used to indicate setting position. Setting the TOC or the IOC pickup current between, but not including 0 and a value less than minimum 0.5 (5 amp) or 0.1 (1 amp) will result in the relay defaulting to its minimum setting. Setting the TOC or IOC pickup current to 0 will disable their respective elements. Although the time dial can be set to a value less than minimum the relay will use the minimum setting.

The relay also provides a front panel trip circuit test. An actuating lever that must be pulled and then lifted is provided to trip the device connected to the relay. The level directly operates the trip contacts.

Targets And Indicators

The yellow pick-up LED will come on solid for the TOC function when the input current to the relay is higher than the set point. The location of the LED is between the frequency/reset switch and the IOC pickup level switch.

It may be desirable to know when the relay is powered up and operating. The relay must be energized at or above 95% of the minimum possible setting and below pick-up set point. To activate, turn the SELECT switch one step clockwise or one step counterclockwise. This will cause the pickup LED to blink at 4 second intervals while current is below the pick-up set point. Minimum current is 95% of minimum TOC pickup setting for both the 1amp and 5 amp models. A blinking LED indicates the microprocessor is executing code and outputting signals.

The relay uses a target and seal-in unit as its tripping element. The relays have one TOC target and one IOC target. The targets are mechanically latched when the function trips. The trip contacts will remain closed until the trip circuit current drops below 0.19 A.

NOTE: Do not attempt to reset the trip target while DC is still applied – this may damage the output contact.

Reset And Manual Trip

Targets can be reset by depressing the front cover target reset button for the DIFC or lifting the target reset level at the lower left edge of the cover on the DIAC and DSFC.

Trip Circuit Test

The front panel contains two manual trip levers to test the trip circuit. The relay cover must be removed to access the lever. The lever must be pulled and then lifted which prevents unintentional uplifted to prevent unintentional operation.

Trip Circuit

CAUTION: The trip circuit is polarity sensitive. The trip circuit will not be damaged if connected in reverse. However, it will not trip the associated breaker. The trip circuit is configured to have the positive battery terminal connected to Stud 1 for the TOC and IOC trip circuit and the negative to Stud 2 (TOC) and Stud 3 (IOC).

NOTE: Both trip circuits are suitable for use with Cap-Trip devices.

Cover Installation DIAC and DSFC

NOTE: When replacing the cover on the DIAC and DSFC relays the reset wire should be "locked" behind the nameplate by a slight left to right motion to place the reset wire in the correct position.

Receiving, Handling And Storage

Immediately upon receipt, the relay should be unpacked and examined for any damage sustained during shipment. If damage occurred during shipment a damage claim should be filed at once with the transportation company, and the nearest GE sales office should be notified. If the relay is not installed immediately, it should be stored in its original carton in a location that is dry and protected from dust, metallic chips and severe atmospheric conditions.

INSTALLATION

Environment

Installation of the relay should be in a clean dry location that is free from dust.

Mounting

The relay should be securely mounted on a vertical surface that provides accessibility to both the front and rear of the unit. The outline and panel drilling dimensions are provided in figures 20, 21, 21A, and 22 for each stile case. An additional surface mounting option is available for the DIFC relay.

Surge Ground (DIAC and DSFC)

The relay should be grounded to the station ground mat with a 12 AWG braided ground lead connected to terminal 4. If the relay is to be retrofitted in a panel, terminal 4 should be removed from the new case and installed into the old case. For the surge protection to function properly the relay must be grounded.

Surge Ground and RFI Immunity (DIFC only)

The relay should be grounded to the station ground mat with a 12 AWG braided ground lead connected to Terminal 4 when replacing IFC relays. The IFC relay and case must be removed and replaced with the DIFC relay and case.

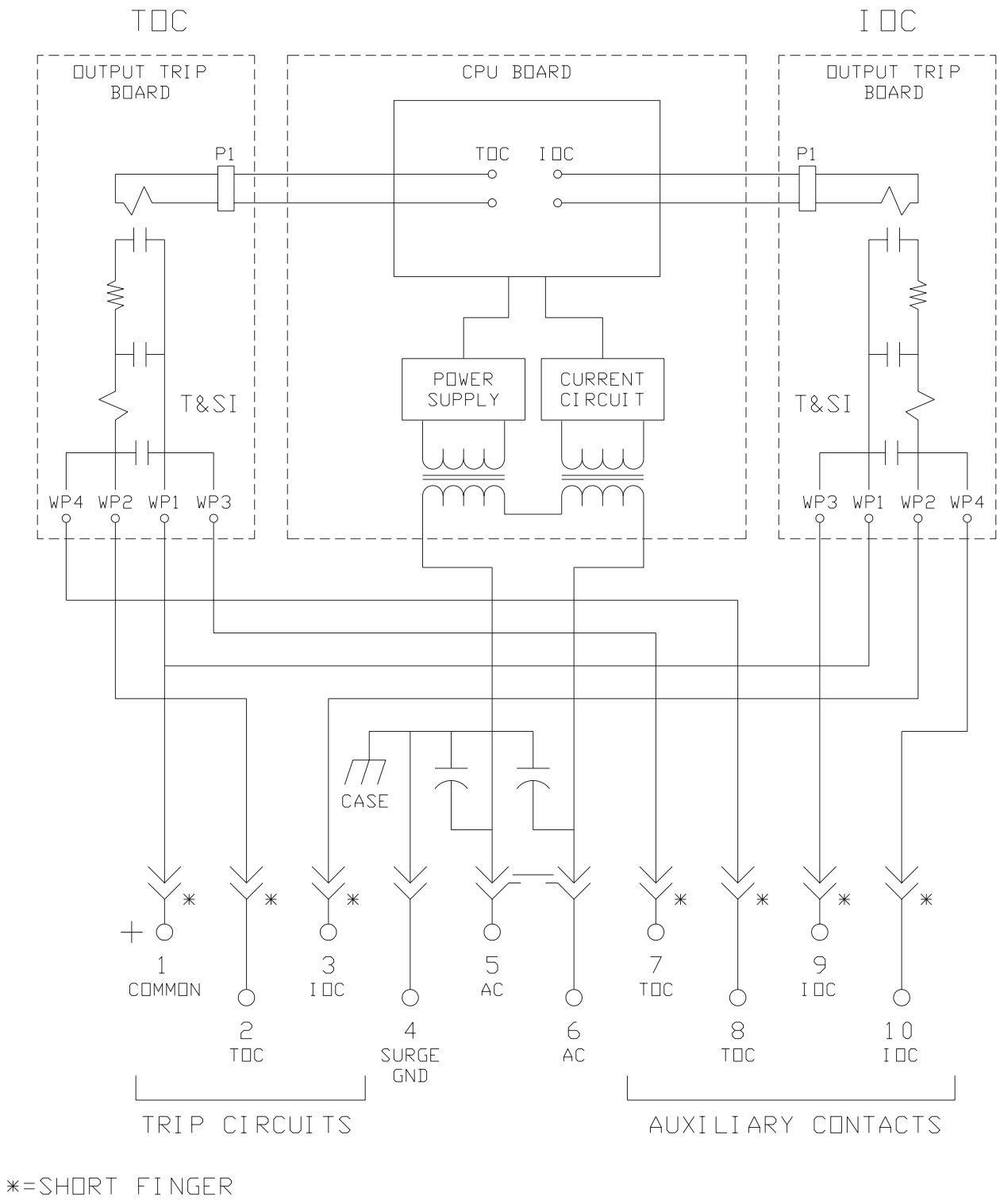


Figure 18: DIAC and DSFC External / Internal Connections

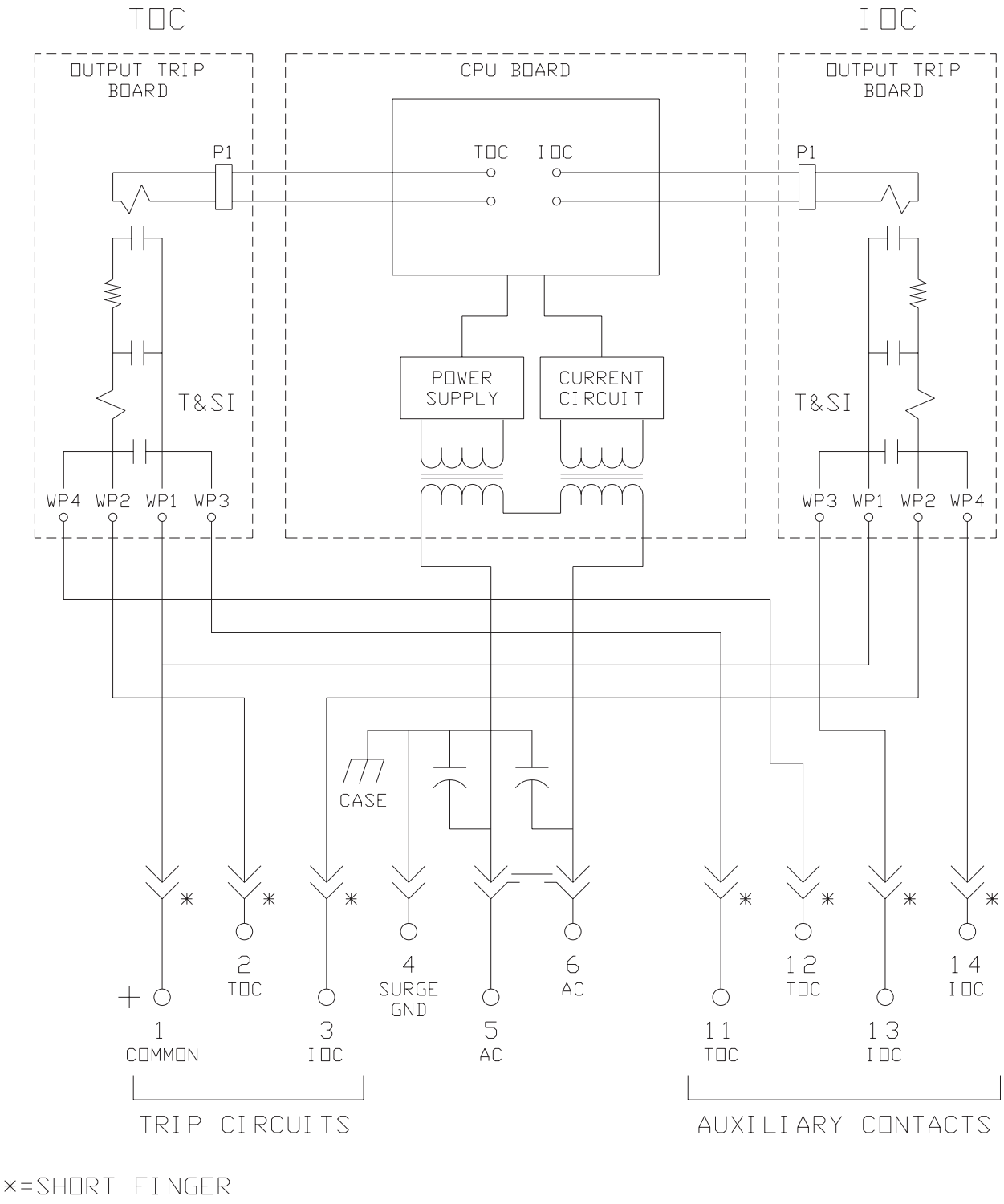


Figure 19: DIFC External / Internal Connections

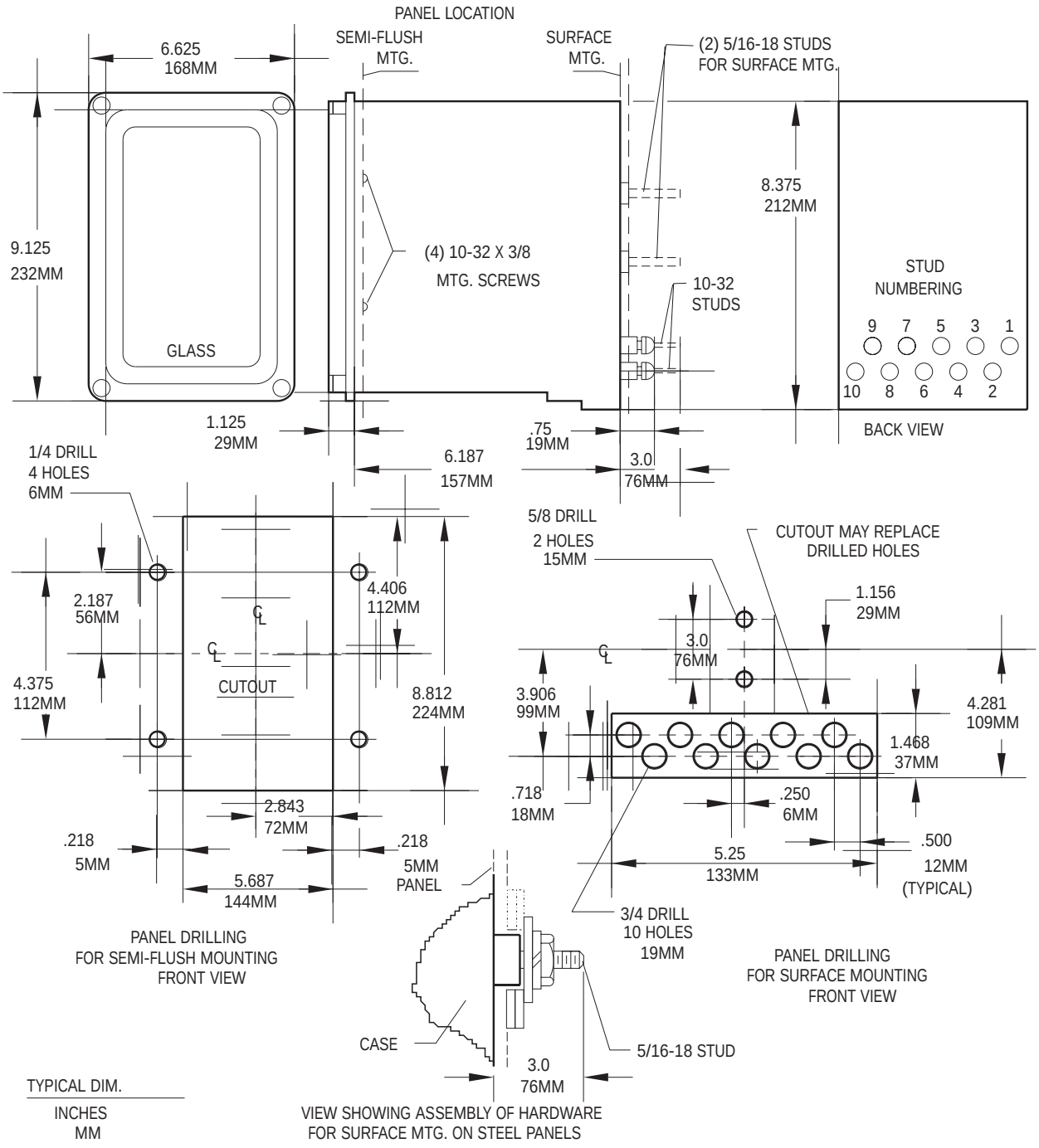


Figure 20: DIAC Panel Mounting and Drilling

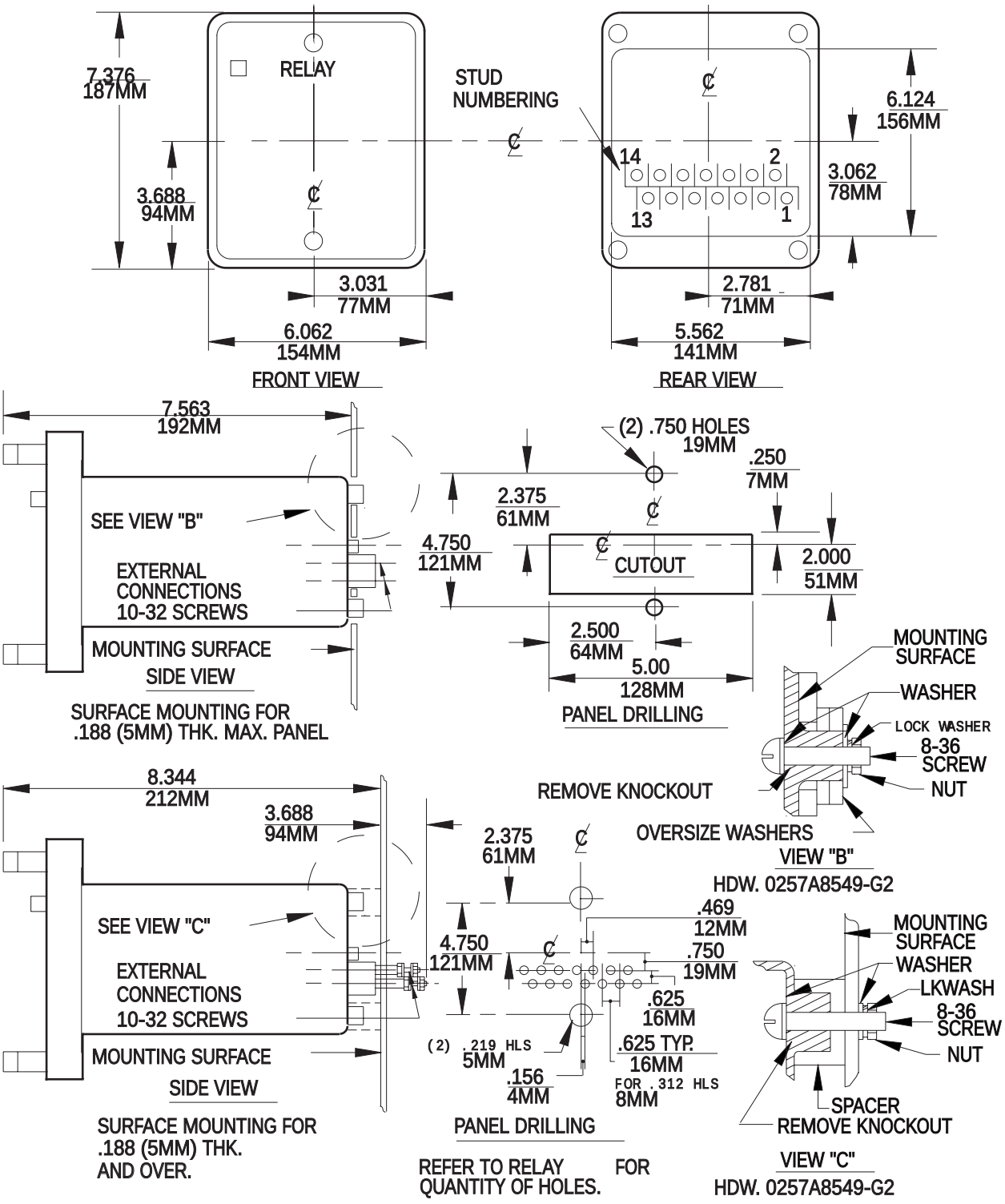


Figure 21: DIFC Panel Mounting and Drilling

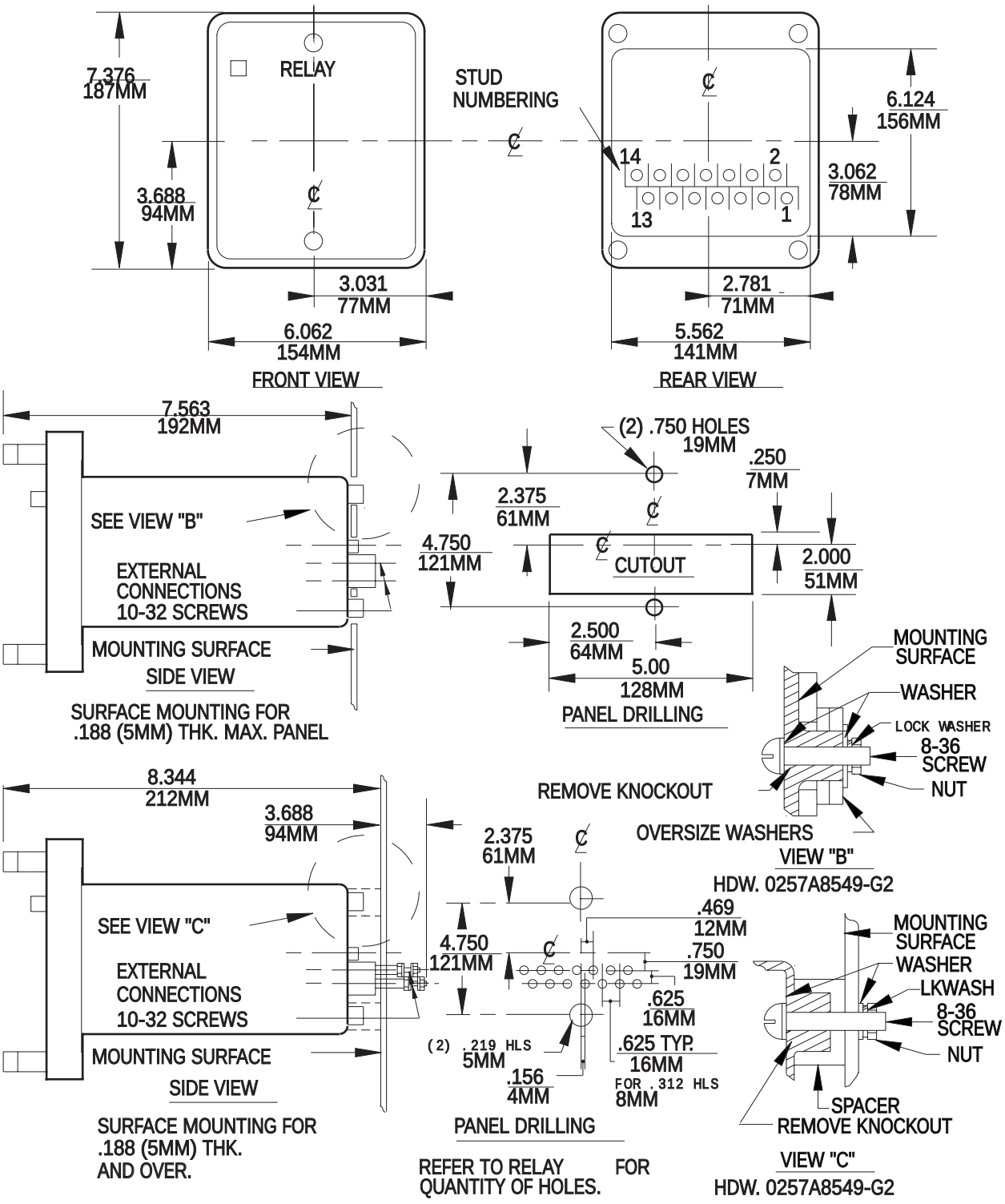


Figure 22: SURFACE MOUNTING DIFC

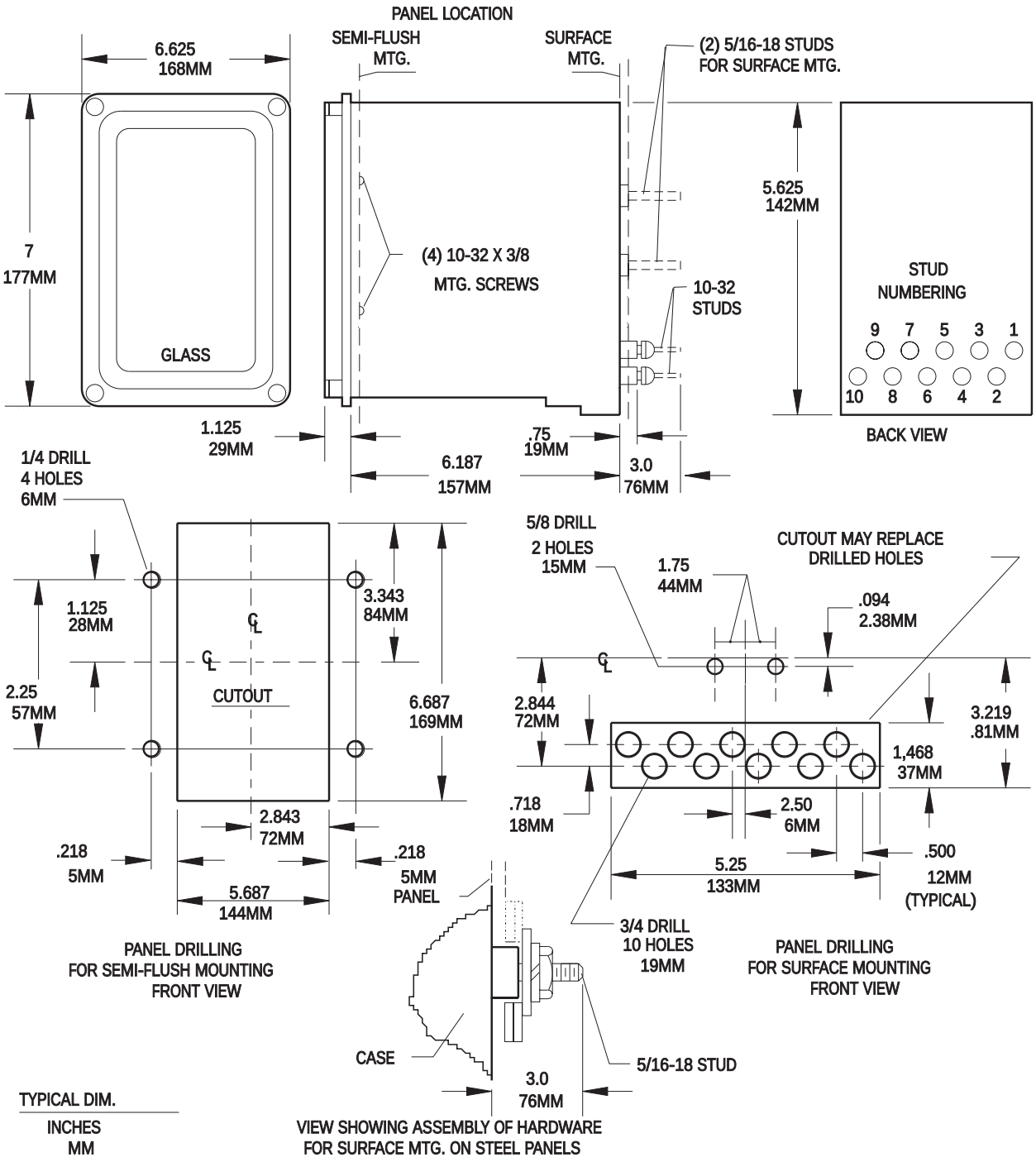


Figure 23: DSFC Panel Mounting and Drilling

ACCEPTANCE TESTS

Immediately upon receipt of the relay, an inspection and acceptance test should be made to make sure that no damage has been sustained in shipment, and that the relay calibrations have not been disturbed.

Visual Inspection

Check the nameplate stamping to make sure that the model number and rating of the relay agree with the requisition. Remove the relay from its case and check that there are no broken or cracked molded parts or other signs of physical damage, and that all screws are tight.

Mechanical Inspection

1. The target and seal-in unit, pull and lift the TOC lever to test the target, repeat the test for the IOC target. The Target flag should remain when the lever is released. Reset the target by pushing the reset bar.
2. Make sure that the fingers and shorting bars agree with the internal connections diagram.

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 auxiliary brush be bent high enough to engage the connection plug or test plug before the main brushes do. This will prevent CT (current Transformer) secondary circuits from being opened.

Electrical Tests

DRAWOUT RELAYS, GENERAL

Since all drawout relays in service operate in their cases, it is recommended that they be tested in their cases or an equivalent case. A relay may be tested without removing it from the panel by using the appropriate test plug. For a C case, use the XCA test plug; for a V or S case, use the XLA series test plug (refer to the GE Power Management Product Catalog). Although the test plugs provide greater flexibility, it requires C.T. shorting jumpers and exercise of greater care since connections are made to both the relay and the external circuitry.

INVERSE TIME UNIT

Pickup Verification

- Connect the relay as indicated in Figure 24 or 25. In order to apply current to the relay, use a 50/60 Hz voltage source, with a variable resistor in series, or an electronic current source.
- Set the relay at the desired pickup TOC and disable the instantaneous unit by setting the instantaneous current setting to zero (0).

Apply current to the relay and verify that the Pickup LED on the front of the relay lights between 98% and 102% of the pickup TOC setting. If the relay is set to blink between power up and pickup, look for the LED to be on most or all of the time to indicate pickup.

Reduce the current applied, verifying that at a value between 95% and 100% of the pickup TOC, the relay Pickup LED turns off or blinks if set to blink.

Verification of Operating Time

Because the Digital self powered series of relays has many different curve characteristics, the basic test instruction will be given and the data for each of the curves can be found in Table 1. With the relay still connected as indicated in Figure 24 or 25, set the time overcurrent unit to minimum pickup and set the corresponding time dial to 5. Successively apply currents of 2, 5, and 10 times pickup TOC, verifying that the operating times are within the margins indicated in Table 1.

NOTE: Before attempting to reset the trip target, ensure the DC supply is removed or turned off from the trip circuit setup

Note: Time measured in seconds

Table 1: Pickup Times for Varying Multiples of Pickup (MPU)

CURVE*	MPU		
	2	**5**	**10**
IAC 51	3.62 - 4.005	1.69 - 1.86	1.19 - 1.32
IAC 53	6.66 - 7.36	1.25 - 1.37	0.687 - 0.759
55-ST	0.298 - 0.330	0.155 - 0.17	0.133 - 0.14
57-MT	20.4 - 22.62	8.82 - 9.75	5.7 - 6.3
66-LT	42.7 - 47.2	17.28 - 19.1	10.78 - 11.9
75-ST	0.748 - 0.827	0.3113 - 0.344	0.244 - 0.2707
IAC 77	6.49 - 7.17	0.859 - 0.954	0.266 - 0.296
95-ST	0.895 - 0.994	0.356 - 0.396	0.276 - 0.303
IEEE Inverse	3.59 - 3.99	1.59 - 1.76	1.12 - 1.25
IEEE Very Inverse	6.51 - 7.24	1.21 - 1.34	0.64 - 0.71
IEEE Ext. Inverse	8.76 - 9.73	1.18 - 1.32	0.374 - 0.412
IEC Inverse	4.73 - 5.26	2.0 - 2.22	1.39 - 1.54
IEC Very Inverse	6.31 - 7.014	1.56 - 1.73	0.69 - 0.768
IEC Ext. Inverse	12.3 - 13.7	1.51 - 1.67	0.369 - 0.41
Definite Time	4.71 - 5.24	4.71 - 5.24	4.71 - 5.21
12T	1.175 - 1.31	0.191 - 0.212	0.051 - 0.056

* TD = 5

For the Definite Time Characteristics, based on any current input, the time should be half of the maximum value.

Verification of Time Dial

Set the relay at the minimum pickup TOC and verify that with an input current of five times (5x) pickup TOC, the operating time is between the margins shown in Table 2.

Table 2: Pickup Times for Varying Time Dials

CURVE*	Time Dial			
	10	**7**	**3**	**1**
IAC51	3.64 - 4.05	2.42 - 2.69	0.996 - 1.106	0.372 - 0.413
IAC53	2.73 - 3.03	1.78 - 1.98	0.742 - 0.824	0.025 - 0.028
55-ST	0.29 - 0.32	0.21 - 0.23	0.10 - 0.12	0.058 - 0.064
57-MT	17.3 - 19.3	12.2 - 13.65	5.27 - 5.86	1.783 - 1.98
66-LT	33.9 - 37.7	24.1 - 26.7	10.3 - 11.4	3.46 - 3.848
75-ST	0.577 - 0.641	0.424 - 0.471	0.2 - 0.221	0.09 - 0.1
IAC77	1.81 - 2.013	1.2 - 1.33	0.545 - 0.605	0.228 - 0.253
95-ST	0.69 - 0.767	0.49 - 0.544	0.23 - 0.252	0.102 - 0.11
IEC Inverse	3.94 - 4.37	2.79 - 3.1	1.21 - 1.34	0.431 - 0.478
IEC Very Inverse	3.06 - 3.402	2.17 - 2.415	0.95 - 1.05	0.332 - 0.369
IEC Ext. Inverse	2.95 - 3.284	2.109 - 2.33	0.913 - 1.015	0.329 - 0.364
IEEE Inverse	3.108 - 3.45	2.206 - 2.45	0.95 - 1.06	0.345 - 0.384
IEEE Very Inverse	2.39 - 2.635	1.69 - 1.88	0.745 - 0.828	0.273 - 0.304
IEEE Ext. Inverse	2.32 - 2.58	1.65 - 1.84	0.734 - 0.815	0.266 - 0.296
Definite Time	9.5 - 10.5	6.65 - 7.31	2.83 - 3.15	0.95 - 1.05
12T	0.351 - 0.3865	0.256 - 0.282	0.124 - 0.137	0.0664 - 0.073

* MPU = 5X

INSTANTANEOUS UNIT

The Instantaneous unit is designed similarly to a hinged armature instantaneous unit. The instantaneous unit will react differently depending on how the signal is applied. If the signal is applied suddenly with no prefault current, the operating time will be longer. If a prefault current is applied prior to the fault the operating time will be shorter. The following test determines that the instantaneous unit is working correctly and confirms the operating time for faults applied with no prefault current.

Connect the relay as shown in Figure 26 or 27, Set the instantaneous unit pickup to 2 amps (5 amp rated relay) or 0.4 amps (1 amp rated relay) with a zero IOC delay setting. Apply 6 amps (5 amp rated relay) or 1.2 amps (1 amp rated relay) and measure the operating time. The operating time should be between 32 ms and 46 ms. This time is subject to dependent on the multiple of pickup current and the fault incidence angle. A graph of how the instantaneous unit varies as a function of input current is provided in this book for reference, Figure 17.

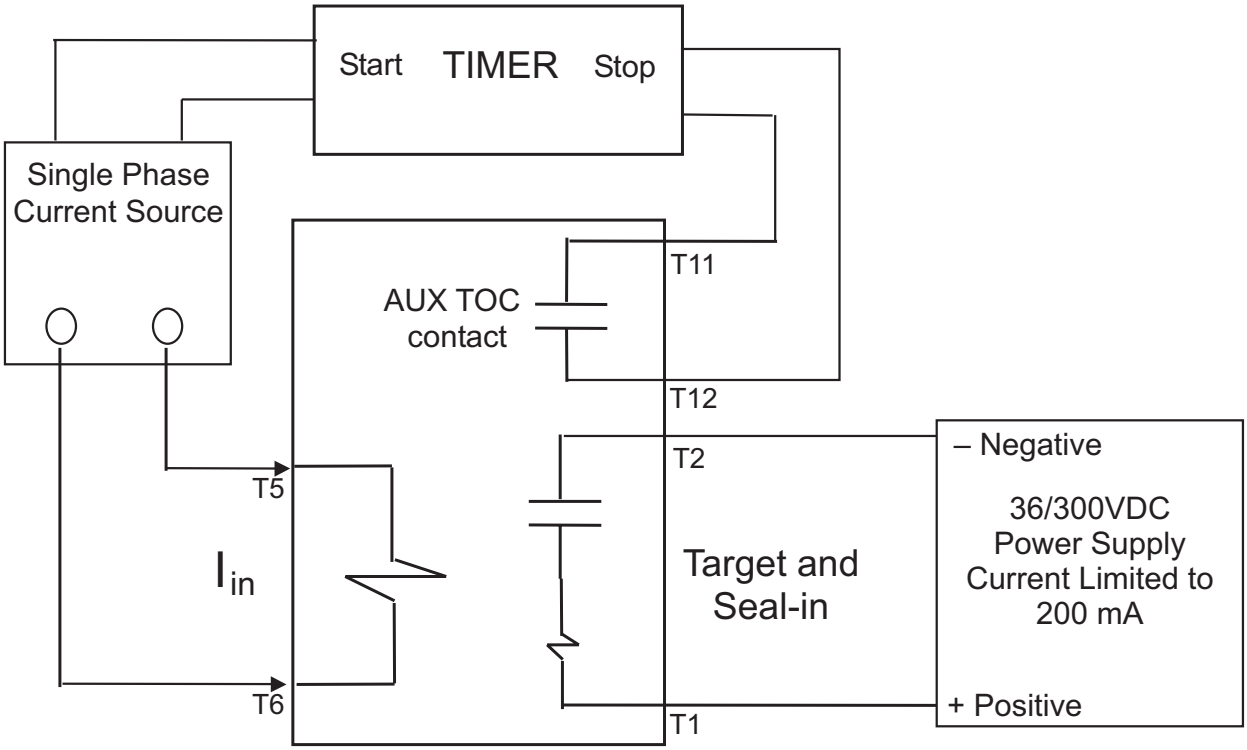


Figure 24: DIFC Test Setup for Pickup and Operating Time Verification

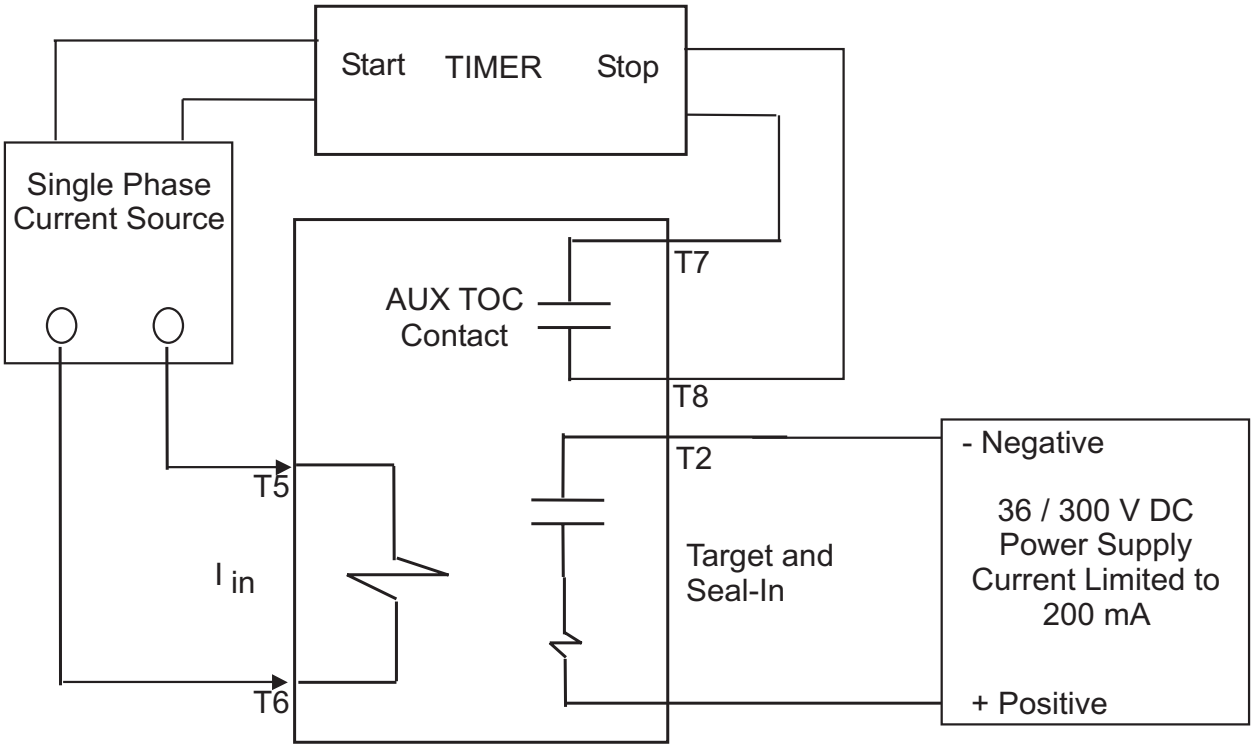


Figure 25: DIAC or DSFC Test Setup for Pickup and Operating Time Verification

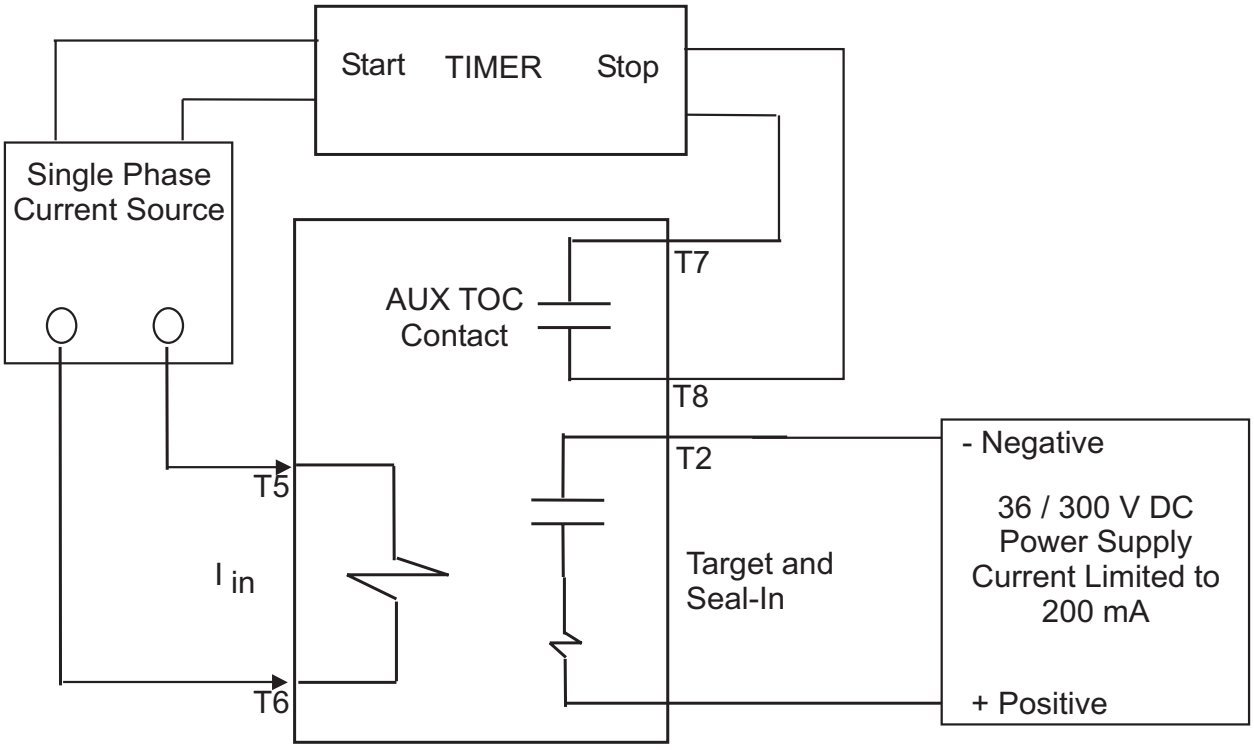


Figure 26: DIFC Test Setup for Instantaneous Unit

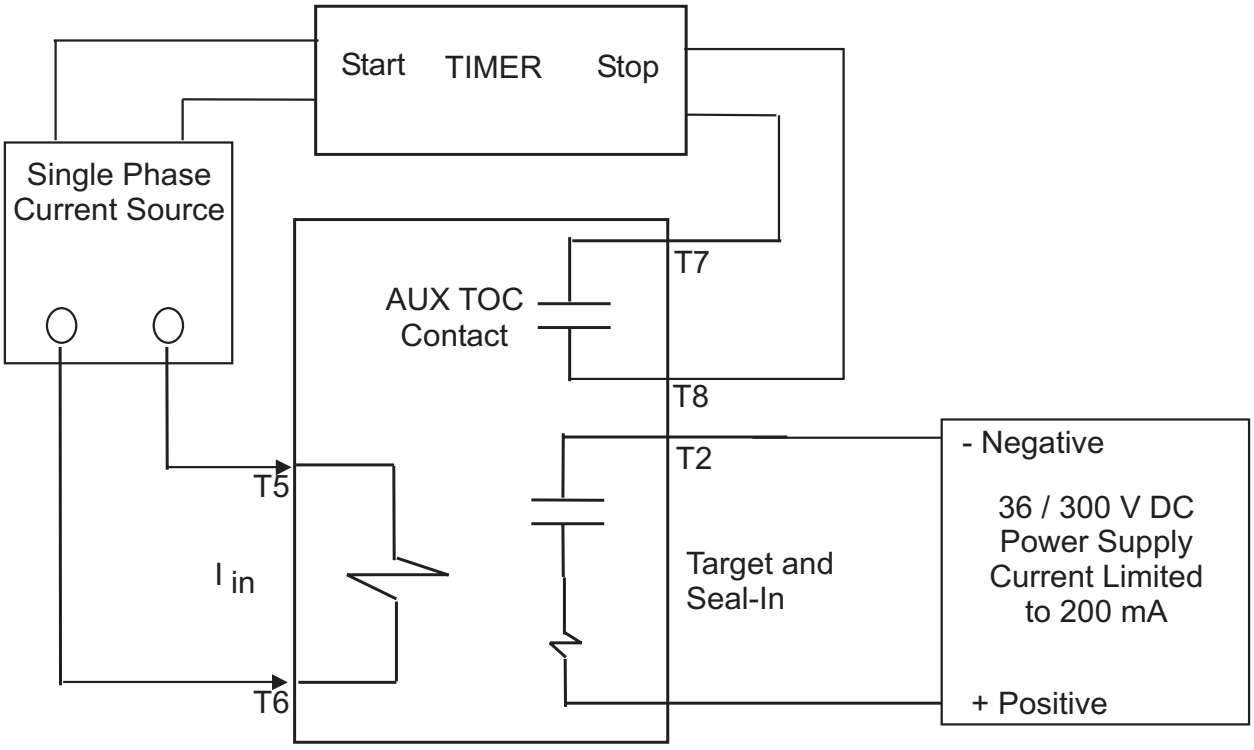


Figure 27: DIAC or DSFC Test Setup for Instantaneous

PERIODIC TESTS AND SERVICING

Periodic Tests

It is recommended that the user perform a periodic test to verify that the relay is operating properly. It is recommended that a portion of the acceptance tests be performed to verify the relay. An inspection of the seal-in contacts can be performed by removing the relay from its case and visually inspecting the contacts for corrosion.

Servicing

If the relay fails to perform as specified in this instruction manual consult the factory or call your local GE sales office. Before returning the relay consult with the factory's technical support.

It is not recommended that the relay be serviced to the component level. This requires substantial investment in repair/test equipment and in technical expertise, and usually results in a longer down time than if a spare relay were used in its place, while the unit is shipped back to the factory.

Figure 28 (9819647/8919648): DIAC Front and Rear Views

Figure 29 (8919652/8919653): DIFC Front and Rear Views

Figure 30 (8919632/8919661): DSFC Front and Rear Views

SPECIFICATIONS

Burdens

Burdens for the over-current units are listed in Table 3. Burdens decrease with increasing current above minimum setting, due to the power supply shunting in the power supply circuit. Since the power supply is the major portion of the burden, the burden for a given input current will be constant, irrespective of pick-up settings on both TOC and IOC units.

Table 3: Burden Settings

			Burden @ Minimum Setting				Burden in ohms (Z) at multiples of minimum pickup			
Unit	Range	Hz	R	jX	Z	∠	3 ×	10 ×	20 ×	100 ×
1 A	0.1 / 31.8	60	28.8	29.2	41.3	45°	9.36	2.32	1.24	0.768
5 A	0.5 / 15.9	60	1.28	1.15	1.74	42°	0.394	0.094	0.052	0.034

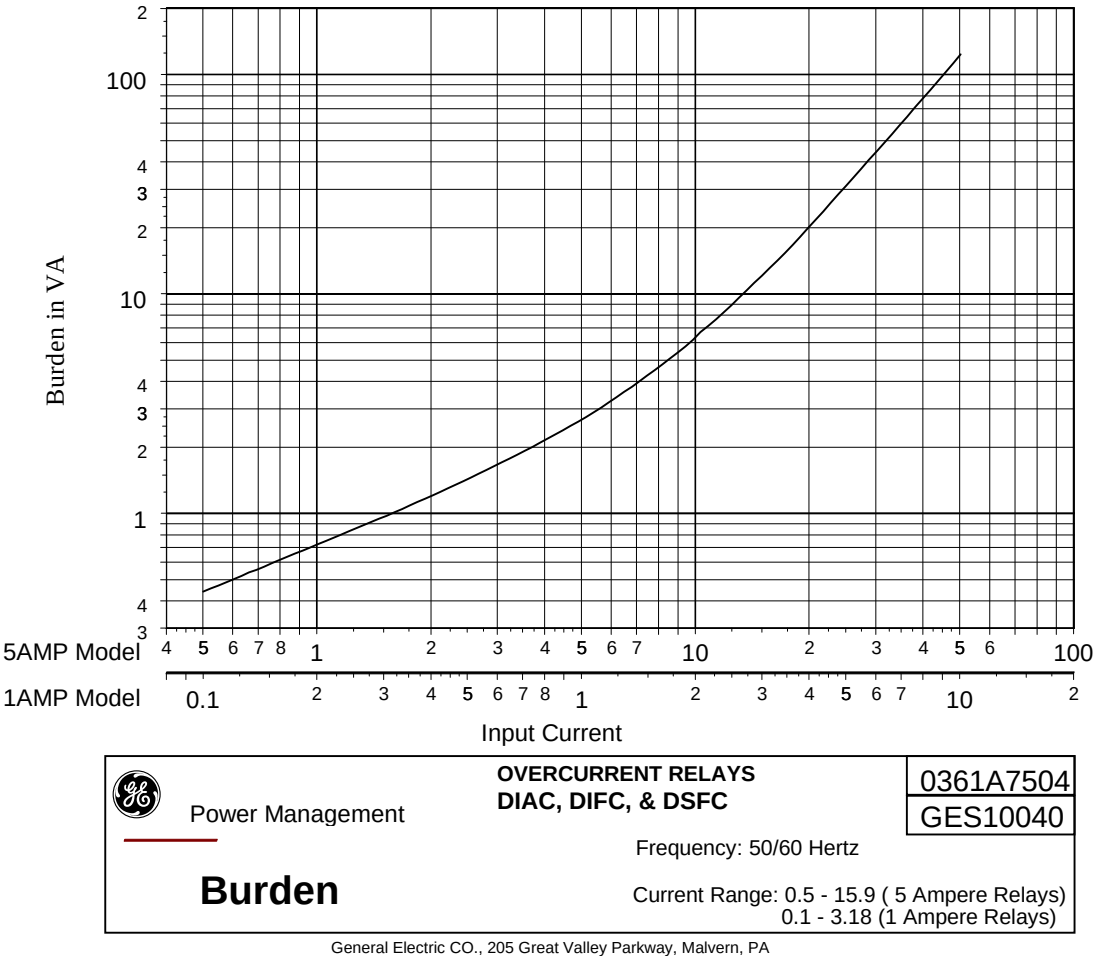


Figure 31: Burden curve

Ratings

Frequency: 50 / 60 Hz

Current: 1A or 5A Models

Maximum Permissible Current, 1 A Model:
- Continuous: 3 A
- 3 seconds: 50 A
- 1 second: 100 A

Maximum Permissible Current, 5 A Model:
- Continuous: 15 A
- 3 seconds: 250 A
- 1 second: 500 A

Operating Current Range, 1 A Model
- minimum: 0.095 A
- I2T (constant): 1520

Operating Current Range, 5 A Model
- minimum: 0.475 A
- I2T (constant): 38000

Maximum Transient Overreach: 7%

Burdens

0.1/0.5 A (1/5A unit): 0.475 VA

1.0/5 A (1/5A unit): 2.6 VA

See Figure 31 for curve and Table 3 for settings.

Contact Ratings

Output Contacts:

	Voltage	Cont.	Make and carry 1 sec.	Break	Max load
DC Resistive	125V 250V	10A	30A	0.5A 0.3A	60W
DC Inductive L/R=40ms	125V 250V 370V	10A	30A	0.25A 0.15A 0.05A	50VA

NOTE: Suitable for Cap-Trip devices.

Environmental

Ambient Temperature:
- Storage: 40 to 85°C
- Operation: –40 to 70°C
- Humidity: Up to 95% without condensing.

Insulation Withstand Tests

Impulse Voltage: 5 kV peak, 1.2 / 50 µs, 0.5 Joules.
Per: IEC255-5, Class III

Surge Withstand Capability

Fast Transient: per ANSI C37.90.1 and IEC 255-22-4 Class IV

Oscillatory: per ANSI C37.90.1 and IEC 255-22-1 Class IV

Radio Frequency Withstand

25 MHz to 1 GHz keyed every 1 MHz for 2 sec.; per ANSI C37.90.2 and IEC 255-22-3

Electrostatic Discharge

Per: IEC 225-22-2

APPLICATION NOTES

IOC/TOC Unit

The relay has one TOC target and one IOC target and uses a seal-in unit as its tripping element. The trip contact remains closed until the trip circuit drops below 0.19 A. A breaker contact (52a) can be provided in series with the trip circuit to reset the target once the breaker tripped on fault.

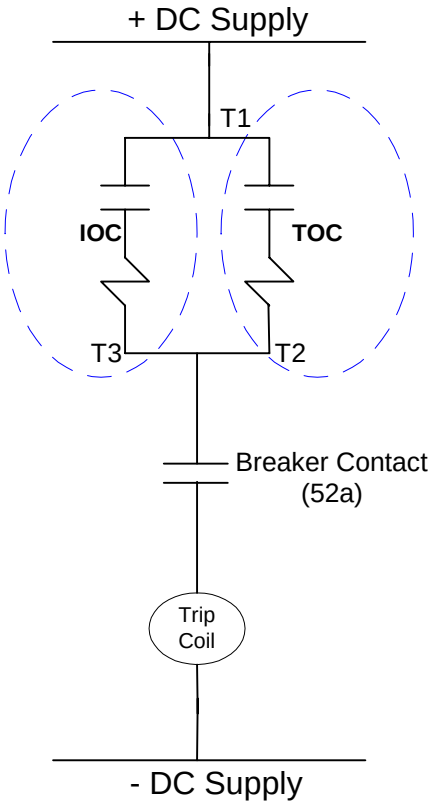


Figure 32: IOC/TOC UNIT

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