



## Power+™ Trip Units

for WavePro™ Low-Voltage Power Circuit Breakers

### User's Guide



## Power+™ Trip Units

### Getting Started

Since this Trip Unit is available in a variety of configurations, please take a moment to compare the catalog number of your purchased Trip Unit with the catalog number key below.

**Example**

**J 3 32 LSI T1 R**

Code	Description	Function
J	WavePro	Breaker Family
8 1 2 3 4	800 A 1600 A 2000 A 3200 A 4000 A	Breaker Frames
01 04 08 16 20 32 40	150 A 400 A 800 A 1600 A 2000 A 3200 A 4000 A	Installed CT
L S I	Long-time (Standard) Short-time (Optional) Instantaneous (Standard)	Overcurrent Protection
(none) T1 T2	TARGET00 (blank insert) TARGET01 (w/o ground fault) TARGET02 (with ground fault)	Target Module Installed
R	Replacement unit	Ordered as Replacement

Example – a Trip Unit with catalog number J332LSIT1R has the following features:

- WavePro circuit breaker
- 3200 A maximum CT
- 3200 A CT installed
- Long-time, short-time, and instantaneous overcurrent protection
- Target module without ground fault indication
- Trip Unit was ordered as a replacement

## DEH-179

### ***WARNINGS, CAUTIONS, AND NOTES AS USED IN THIS PUBLICATION***

#### ***WARNINGS***

Warning notices are used in this publication to emphasize that hazardous voltages, currents, or other conditions that could cause personal injury or death are present in this equipment or may be associated with its use.

Warning notices are also used for situations in which inattention or lack of equipment knowledge could cause either personal injury or damage to equipment.

#### ***CAUTIONS***

Caution notices are used for situations in which equipment might be damaged if care is not taken.

#### ***NOTES***

Notes call attention to information that is especially significant to understanding and operating the equipment.

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## 1-1 Applications

The Power+™ Trip Units described in this publication are used on WavePro™ low-voltage power circuit breakers.

Figure 1 shows the Power+ Trip Unit.

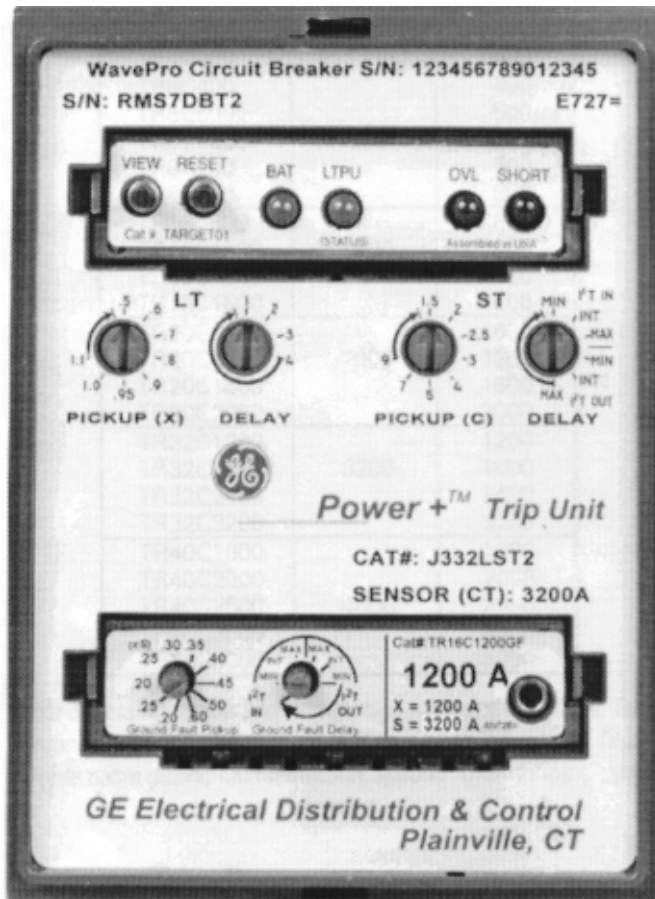


Figure 1. Front view of the Power+ Trip Unit.

## 1-2 General

Power+ Trip Units are the same size and have the same 50-pin male D-sub connector as the RMS9D series of MicroVersaTrip Plus™ and MicroVersaTrip PM™ Trip Units.

Power+ Trip Units may be tested with the Trip Unit installed in the circuit breaker, the rating plug installed in the Trip Unit, and the breaker carrying current. The Test Kit plugs into the test socket of the rating plug. The Test Kit catalog number is TVRMS2 and its operation is described in GEK-97367.

Power+ Trip Units are removable from the circuit breaker. For instructions on installing and removing the Trip Unit, see Chapter 4.

**CAUTION:** Removal of a Trip Unit from its breaker must be performed with the breaker in the OPEN or TRIPPED position. Draw-out breakers should be racked out first.

**ATTENTION:** Pour retirer déclencheur, le disjoncteur doit être en position ouverte ou déclenchée. Les disjoncteurs débrochables doivent être en position débrochée.

**CAUTION:** Do not attempt to operate the breaker without its assigned Trip Unit. Installation of an incorrect Trip Unit may result in unsafe operation of the breaker.

**ATTENTION:** Ne pas utiliser le disjoncteur sans son déclencheur. Une mauvaise installation du déclencheur peut être dangereuse.

**NOTE:** Trip Units as received may have settings that are undesirable for the specific application. Ensure that settings are appropriately adjusted before energizing.

**NOTE:** Les disjoncteurs sont livrés avec des réglages standards qui peuvent être inadéquates pour certaines applications. Vérifier ces réglages avant de mettre le disjoncteur sous tension.

## 1-3 Trip Unit Functions

Power+ Trip Units have specific standard and optional functions, with the current rating determined by installation of the appropriate interchangeable rating plug. The standard functions of the Trip Unit are as follows:

- Overcurrent protection
  - Long-time protection
  - Instantaneous protection

The optional functions available are as follows:

- Protection
  - Short-time protection, with or without I<sup>2</sup>T
  - Ground-fault protection, with or without I<sup>2</sup>T
- Status
  - Trip targets (with or without ground-fault trip indication)
  - Health monitor

### 1–4 Trip Unit Catalog Numbers

A simple catalog-numbering system defines all of the standard and optional Trip Unit functions. A complete catalog numbering key is found inside the front cover. Each of the segments of the catalog number is described below.

The first character indicates the breaker type for which the Trip Unit is configured, as listed in Table 1.

Character	Breaker Type
J	WavePro

Table 1. Breaker type referred to by the first character of the Trip Unit catalog number.

The second character of the catalog number indicates the breaker frame rating, as listed in Table 2.

Character	Breaker Frame
8	800 A
1	1600 A
2	2000 A
3	3200 A
4	4000 A

Table 2. Breaker frame rating, given by the second character of the Trip Unit catalog number.

The third and fourth characters of the catalog number indicate the CT that is actually installed in the circuit breaker, as listed in Table 3.

Characters	Installed CT
01	150 A
04	400 A
08	800 A
16	1600 A
20	2000 A
32	3200 A
40	4000 A

Table 3. Installed CT, as indicated by the third and fourth characters of the Trip Unit catalog number.

Following the code numbers for installed CT, letters are appended to the catalog number to indicate installed protective functions as listed in Table 4. These suffixes are appended from left to right in the order given.

Suffix	Protective Function
L	Long-time overcurrent
S	Short-time overcurrent
I	Instantaneous overcurrent

Table 4. Trip unit catalog number suffixes for installed protective functions.

Following the protective function letters is a two-character code indicating the type of target module installed (if any), as listed in Table 5.

Suffix	Target Module Cat. No.
(none)	TARGET00 (blank)
T1	TARGET01 (w/o GF)
T2	TARGET02 (with GF)

Table 5. Trip Unit catalog number code indicating the Target Module installed.

Finally, if the Trip Unit was ordered as a replacement, the letter “R” is appended to the catalog number.

For example, a Trip Unit with catalog number J332LSIT1R has the following functions:

- J3 – Trip Unit for WavePro breaker with a frame rating of 3200 A
- 32 – Installed current sensor (CT) of 3200 A
- L – Long-time overcurrent protection
- S – Short-time overcurrent protection
- I – Instantaneous overcurrent protection.
- T1 – Target module without ground-fault trip indication
- R – Trip Unit was ordered as a replacement

### 1–5 Rating Plugs

Interchangeable rating plugs are used to establish or change the trip rating of the breaker. A built-in rejection feature prevents the insertion of a rating plug with an incorrect sensor rating into a Trip Unit. Rating plug catalog numbers are listed in Table 6. A rating plug is shown in Figure 2.



Cat. No.	Sensor Rating, A	Plug Rating, A
TR1C80	150	80
TR1C100		100
TR1C125		125
TR1C150		150
TR4C200	400	200
TR4C225		225
TR4C250		250
TR4C300		300
TR4C400		400
TR8C400	800	400
TR8C500		500
TR8C600		600
TR8C700		700
TR8C800		800
TR16C800	1600	800
TR16C1000		1000
TR16C1200		1200
TR16C1600		1600
TR20C1000	2000	1000
TR20C1200		1200
TR20C1600		1600
TR20C2000		2000
TR32C1200	3200	1200
TR32C1600		1600
TR32C2400		2400
TR32C3200		3200
TR40C1600	4000	1600
TR40C2000		2000
TR40C2500		2500
TR40C3000		3000
TR40C4000		4000

Table 6. Catalog numbers for rating plugs without ground fault. To add ground-fault protection, append "GF" to the catalog number. To add defeatable ground-fault protection, append "GFD" to the catalog number.

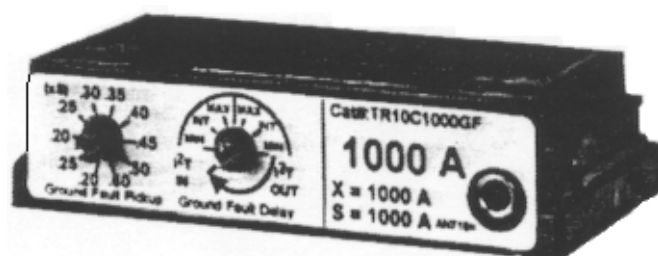


Figure 2. Power+ rating plug shown with optional ground-fault protection function.

**CAUTION:** Removal of the rating plug while the breaker is carrying current reduces the breaker's current-carrying capacity to approximately 25% of the current sensor rating. This may result in undesired tripping.

**ATTENTION:** Si le calibre est retiré alors que le disjoncteur est sous tension, le déclencheur se règle automatiquement à approximativement 25% du calibre du transformateur de courant. Ceci peut entraîner un déclenchement indésirable.

### Ground-Fault Protection

Ground-fault protection with Power+ Trip Units is provided as an option in the rating plug. Rating plugs are available in three configurations:

- No ground-fault protection
- Ground-fault protection
- Defeatable ground-fault protection

Ground-fault protection is activated by installing a rating plug with the ground-fault option into the Trip Unit. The pickup and delay settings available with the switches on the rating plug are described in Chapter 2, *Trip Unit Setup*.

To order a rating plug with the ground-fault protection function, find the rating plug in Table 1 with the desired sensor and plug ratings and append "GF" to the catalog number. To order a rating plug with the defeatable ground-fault protection function, append "GFD" to the catalog number.

**WARNING:** Rating plugs equipped with ground fault must be replaced only with other ground-fault-equipped rating plugs. Failure to do so could result in personal injury or death, as well as damage to equipment.

**AVERTISSEMENT:** Les calibreurs munis d'un détecteur de défaut de mise à la terre ne doivent être remplacés que par des calibreurs munis d'un détecteur de défaut de mise à la terre. La non application de cette directive peut entraîner des blessures ou même provoquer la mort ainsi qu'endommager l'équipement.

### 1-6 Equipment Interfaces

Power+ Trip Units do not usually require connections within the equipment, since all wiring is contained within the circuit breaker. The only connection is for the neutral sensor, which uses a special dedicated disconnect.

**CAUTION:** Neutral current sensors are required for single-phase, three-wire and three-phase, four-wire systems. When the Trip Unit is connected to a three-phase, three-wire system, the neutral sensor terminals of the breaker are left open. Do not short any neutral current sensor terminals in a three-phase, three-wire system, as this could result in damage to, or malfunction of, the electrical system.

**ATTENTION:** Un transformateur de courant de neutre est nécessaire pour les réseaux 3 phases + neutre. Si le neutre n'est pas distribué, les bornes de neutre du déclencheur doivent être laissées ouvertes. Ne pas les court-circuiter (ceci peut endommager le déclencheur et entraîner un mauvais fonctionnement du système électrique).

### Selector Switches

The following selector switches are present on the front of the Trip Unit. See Chapter 2, *Setup Mode*, for a complete description of each function.

- Long-time pickup
- Long-time delay
- Short-time pickup (optional)
- Short-time delay (optional)
- Instantaneous pickup
- Ground-fault pickup (optional, on rating plug)
- Ground-fault delay (optional, on rating plug)

### 1-7 Trip Unit Information

#### Trip Unit Label Information

Following are descriptions of the various numbers on the front of the Trip Unit, as shown in Figure 1.

- *Top center* – Serial number of the breaker in which the Trip Unit is installed, such as 01234567891.
- *Top-left corner* – Serial number of the Trip Unit, such as RMS71234567.
- *Top-right corner* – Date of manufacture code, such as P1121=.
- *Right center above rating plug* – Catalog number of the Trip Unit, such as J220LSIT1.
- *Right center, below catalog number* – Current sensor rating in amperes.

There are two more labels on the Trip Unit that are not generally visible when it is plugged into a breaker.

- *Side of unit* – Bar code giving the catalog number of the Trip Unit.
- *Rear of unit* – Yellow caution label.

## 2-1 Overview

All of the Trip Unit protective functions are set with the rotary selector switches on the front of the unit. Table 7 contains a summary of the functions and the available settings.

Most of the selector switch scales (all but instantaneous pickup) have a heavy curved line, with an arrowhead on one end, connecting the low and high ends of the scale. When the switch points anywhere within this region, the highest value at the end of the line opposite the arrowhead is the active setting.

WavePro circuit breakers are available with Power+™ as well as MicroVersaTrip Plus and MicroVersaTrip PM Trip Units. There are two different sets of abbreviations used to describe the same Trip Unit settings in the documentation and on the Trip Unit labels. These abbreviations are listed in Table 8.

Trip Unit Setting	Abbreviations	
Rating Plug rating, A	xIn	X
Current Sensor rating, A	xCT	S
Current setting, A	xLT	C

Table 8. Comparison of Trip Unit settings abbreviations.

## 2-2 Long-Time Pickup

The long-time pickup set point establishes the breaker's nominal ampere rating,  $C$ , as a fraction of the rating plug current,  $X$ . The choices for  $C$  are .5, .6, .7, .8, .9, .95, 1.0, and 1.1 times  $X$ . Figure 3 illustrates the long-time pickup settings.

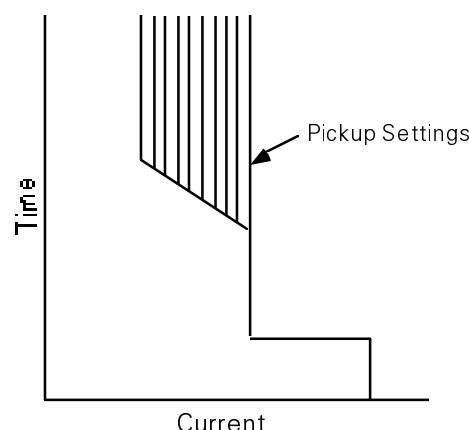


Figure 3. Time-current curve illustrating long-time pickup.

## 2-3 Long-Time Delay

The long-time delay function allows normal momentary overloads without nuisance tripping. The nominal time delays at the lower limits of the bands for 600% of the long-time current set point,  $C$ , for the four selectable bands are listed in Table 9. Figure 4 illustrates the effect of this delay on the trip time.

Band	Delay, sec
1	2.4
2	4.9
3	9.8
4	20

Table 9. Nominal delays for the long-time delay bands.

Parameter	Pickup Settings	Delay Settings	Delay Curve
Long-Time Trip	.5, .6, .7, .8, .9, .95, 1.0, 1.1 multiple of Rating Plug Current (X)	2.4, 4.9, 9.8, 20 seconds (Bands 1, 2, 3, 4)	Fixed
Short-Time Trip	1.5, 2, 2.5, 3, 4, 5, 7, 9 multiple of Long-Time setting (C)	.10, .21, .35 second (Min, Int, Max)	I <sup>2</sup> T In, I <sup>2</sup> T Out
Instantaneous Trip	1.5, 2, 3, 5, 7, 9, 10 <sup>1</sup> , 13 <sup>1</sup> , 15 <sup>1</sup> multiple of Rating Plug Current (X)	No delay	N/A
Ground-Fault Trip	.2, .25, .3, .35, .4, .45, .5, .6 multiple of Sensor rating (S) <sup>2</sup>	.10, .21, .35 seconds (Min, Int, Max)	I <sup>2</sup> T In, I <sup>2</sup> T Out

<sup>1</sup> Maximum setting is limited by the frame size.

<sup>2</sup> Maximum setting is limited to 1200 A. Pickup settings are determined by the breaker frame size

Table 7. Summary of protective functions and setting values for each.

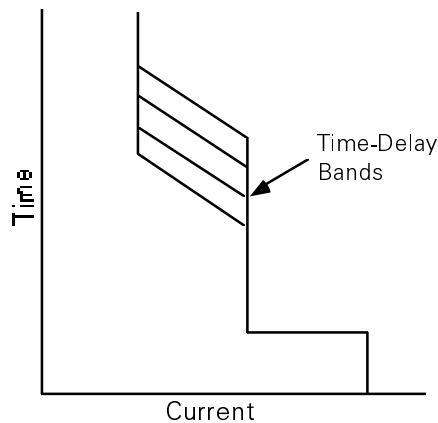


Figure 4. Time-current curve illustrating long-time delay.

## 2-4 Short-Time Pickup

The optional short-time pickup function establishes the current at which short-time trip is activated. Short-time pickup is coupled with long-time pickup and the choices of pickup settings are 1.5, 2, 2.5, 3, 4, 5, 7, and 9 times the long-time setting. The time-current curves for short-time pickup is illustrated in Figure 5.

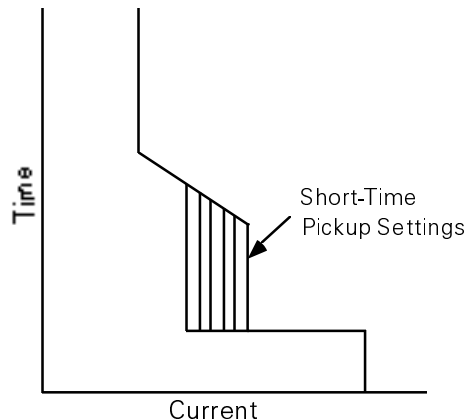
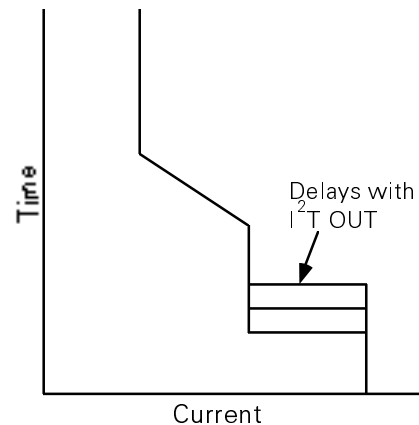
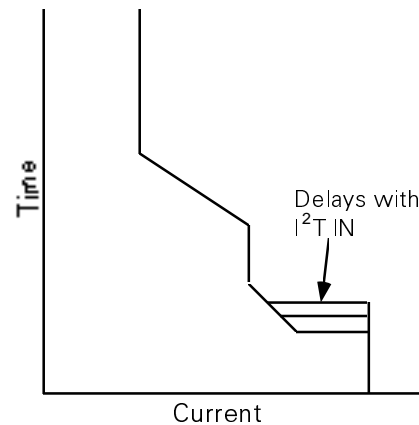


Figure 5. Time-current curves illustrating short-time pickup.

## 2-5 Short-Time Delay

This function delays the breaker trip when the short-time pickup function is activated. The switch settings MIN, INT, and MAX correspond to nominal time delays of .10, .21, and .35 second, respectively. The delay with I<sup>2</sup>T IN is for a current of 600% of *C* at the lower limit of the band. The delay with I<sup>2</sup>T OUT is for the lower limit of each band.

The I<sup>2</sup>T OUT function, illustrated in Figure 6, establishes a constant time delay. I<sup>2</sup>T IN biases the delay with a constant slope, as shown in Figure 7.

Figure 6. Time current curve illustrating short-time delay with I<sup>2</sup>T OUT.Figure 7. Time current curve illustrating short-time delay with I<sup>2</sup>T IN.

## 2-6 Instantaneous Pickup

Instantaneous overcurrent protection causes an immediate breaker trip when the chosen current setting is reached. The pickup current may be set to 1.5, 2, 3, 5, 7, and 9 times the rating plug current, *X*, when the Trip Unit does not have short-time installed, with 10 times *X* also available on 800–2000 A frame breakers. Additional settings of 10, 13, and 15 times *X* are only available when short-time is installed, depending on the breaker frame size.

Note the difference from short-time pickup, which is based on a multiple of the long-time pickup setting, *C*, while instantaneous pickup is based on the rating plug current, *X*. The time-current characteristic is illustrated in Figure 8.

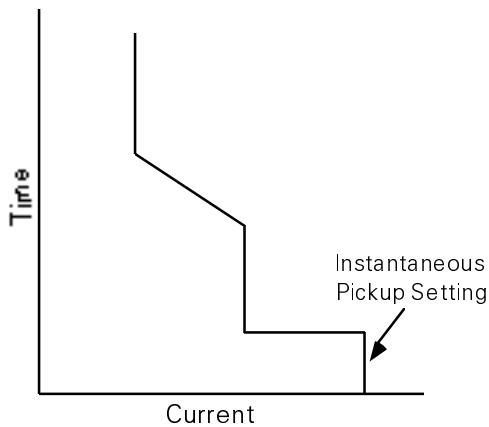


Figure 8. Time-current curve illustrating instantaneous pickup.

## 2-7 Ground-Fault Pickup

Ground-fault pickup is available only with the installation of a rating plug equipped with ground fault. This function sets the pickup current for ground-fault protection. The available settings are listed in Table 10 as multiples of X, the current sensor rating. The maximum setting may be less than .6, depending on the breaker frame size. Figure 9 illustrates the time-current curve for ground-fault pickup.

Breaker Frame	Settings as Multiple of X
800–2000 A	.20, .25, .30, .35, .40, .45, .50, .60
3200 A	.20, .22, .24, .26, .28, .30, .34, .37
4000–5000 A	.20, .22, .24, .26, .28, .30

Table 10. Settings available for ground-fault pickup according to breaker frame size.

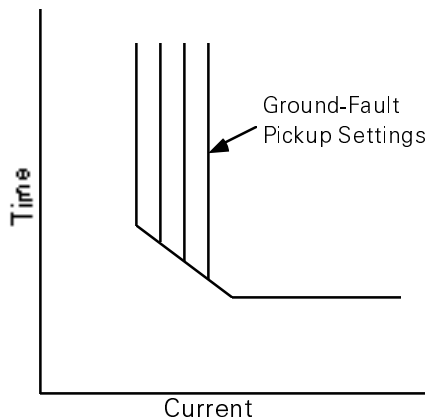


Figure 9. Time-current curve illustrating ground-fault pickup.

## 2-8 Ground-Fault Delay

Ground-fault delay is available only with the installation of a rating plug equipped with ground fault. This function sets the delay before the breaker trips when the ground-fault pickup current is detected. The switch settings MIN, INT, and MAX correspond to nominal time delays of .10, .21, and .35 second, respectively. The delay with I<sup>2</sup>T OUT is for the lower limit of each band. The delay with I<sup>2</sup>T IN is at 200% of the pickup setting at the lower limit of the band.

The I<sup>2</sup>T OUT function, illustrated in Figure 10, establishes a constant time delay. I<sup>2</sup>T IN biases the delay with a constant slope, as shown in Figure 11.

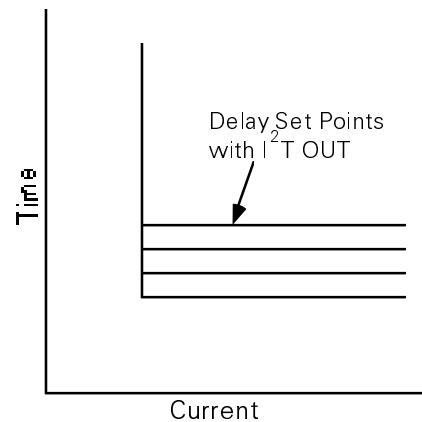


Figure 10. Time-current curve illustrating ground-fault delay with I<sup>2</sup>T OUT.

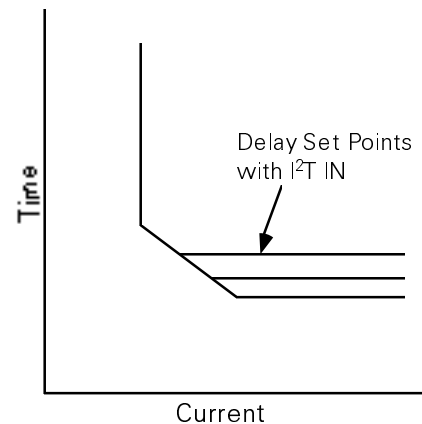


Figure 11. Time-current curve illustrating ground-fault delay with I<sup>2</sup>T IN.

#### ***2-9 Defeatable Ground Fault***

Rating plugs with the suffix “GFD” appended to the catalog number have the additional setting OFF on the Pickup switch, which defeats ground-fault protection. These rating plugs are not UL listed. An interlock mechanism prevents their insertion into Trip Units designed for non-WavePro breakers.

### 3-1 Target Module

Trip Unit status information is provided by the optional target module. This module indicates whether a breaker trip was caused by a short circuit, an overload, or a ground fault, as well as whether the Trip Unit is functioning properly. The target module is shown in Figure 12.

Target modules are available with or without ground-fault trip indication. If a Trip Unit is ordered without a target module, a blank insert is installed in the Trip Unit slot. Catalog numbers are listed in Table 11.

**NOTE:** The target modules that include ground-fault trip indication do not provide the ground-fault protection function. If ground-fault protection is required, a ground-fault-equipped rating plug must be installed in the Trip Unit.

**NOTE:** Les modules à voyants lumineux (target) qui incluent une indication de déclenchement d'un défaut de mise à la terre ne sont pas équipés d'une fonction de protection d'un défaut de mise à la terre. Si une telle fonction est requise, un calibre mini d'une fonction de protection d'un défaut de mise à la terre doit être installé dans le déclencheur.

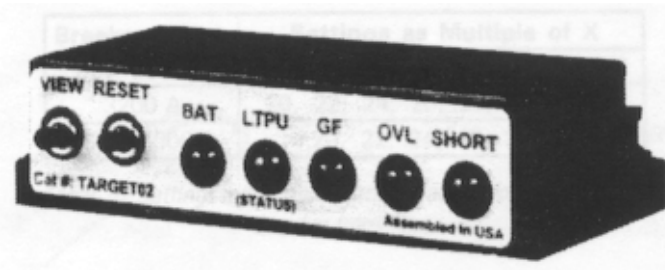


Figure 12. Target module.

Catalog No.	Description
TARGET00	Blank insert
TARGET01	Without ground fault target
TARGET02	With ground fault target

Table 11. Target Module catalog numbers.

### 3-2 Functions

The front of the target module contains two push buttons and either four or five LEDs. The following functions are provided by the target module.

#### Trip Targets

To determine the condition causing a breaker trip, press the VIEW button. One of the three target LEDs will light, as follows:

SC – Short circuit (instantaneous or short-time trip).

OVL – Overload (long-time trip).

GF – Ground fault (this LED is only present on catalog number TARGET02 and is operable only if a rating plug with ground fault is installed in the Trip Unit).

The RESET button clears the trip target indication.

#### Long-Time Pickup Status

Whenever the circuit breaker is carrying at least 95% of the long-time pickup current (C), the LTPU (STATUS) LED begins to blink. Above 100% of the long-time pickup current, the LED is lit continuously, indicating an imminent overload trip.

#### Battery Test

If the breaker has not tripped or if the trip target has been cleared, pressing the VIEW button performs a battery test. The BAT LED will light if the batteries are okay. If the BAT LED is dim or does not light, replace the batteries as described in Chapter 4, *Maintenance and Trouble-Shooting*. Note that the only function of the Target Module batteries is to power the LEDs; they have no effect on Trip Unit operation and are not required to store targets or for any protection functions.

#### Health Monitor

The Trip Unit can be tested for proper functioning if the Trip Unit is powered by one of the following sources:

- A Test Kit (catalog number TVRMS2) is plugged into the jack on the front of the rating plug.
- A Portable Battery Pack (catalog number TVPBP) is plugged into the jack on the front of the rating plug.
- The breaker is carrying a load current of at least 20% of its current sensor rating.
- External +24 Vdc control power is connected.

Press and hold the VIEW button for at least five seconds. If the Trip Unit is operating properly, the LTPU LED will blink slowly. Note that if the Trip Unit is not powered by one of the above sources, this test will not give a true indication of Trip Unit functioning.

#### 4-1 Trip Unit Removal and Replacement

Rejection pins are installed on the rear of all Trip Units to prevent installation of an incorrect Trip Unit into a breaker. Do not use excessive force when installing a Trip Unit.

##### WavePro Low-Voltage Power Circuit Breakers

WavePro circuit breakers are shipped from the factory with their Trip Units installed. Removal is only necessary for replacement.

To remove the Trip Unit, perform the following procedure:

**WARNING:** Before beginning this procedure, turn the breaker OFF, disconnect it from all voltage sources, and discharge the closing springs, if they are charged, by closing and then opening the breaker.

**AVERTISSEMENT:** Avant de commencer cette procédure, mettre le disjoncteur en position OFF, le déconnecter de toute tension d'alimentation, et décharger les ressorts de fermeture.

1. Open the breaker and remove it from the cubicle or substructure. Place it on a suitable work surface. Note that 3200–5000 A frame breakers must be suitably supported so that the spring discharge mechanism is not engaged.
2. Insert the Racking Handle (catalog number 568B731G1) and move the racking mechanism to the TEST position, as shown on the draw-out position indicator.
3. Remove the four screws securing the trim plate on the breaker, then remove the trim plate.
4. Remove the six screws securing the escutcheon to the breaker. Pull the manual charging handle out partway, then slide off the escutcheon.
5. Pull out the locking slide on the right of the Trip Unit mounting plate, then pull the Trip Unit out, carefully disengaging the pins on the rear connector.

To reinstall the Trip Unit, perform the following procedure:

1. Pull out the locking slide on the right of the mounting plate. Push the Trip Unit into place, carefully engaging the 50-pin connector and lining up the rejection posts on the rear of the Trip Unit with the

holes in the mounting plate. Release the locking slide.

2. Check that the breaker racking mechanism is still in the TEST position. Pull the manual charging handle out partway, then slide the handle through the slot in the escutcheon and move the escutcheon into place. Insert the six mounting screws and tighten to 14–20 in-lb.
3. Replace the trim ring around the escutcheon, with the narrow side at the bottom. Insert the four mounting screws and tighten to 14–20 in-lb.
4. Insert the Racking Handle and return the racking mechanism to the DISC position, as shown by the draw-out position indicator.
5. Reinstall the breaker into its cubicle or substructure.

#### 4-2 Rating Plug Removal and Replacement

**CAUTION:** Removal of the rating plug while the breaker is carrying current reduces the breaker's current-carrying capacity to approximately 25% of the current sensor rating.

**ATTENTION:** Si le calibre est retiré le disjoncteur et traversé par un courant, le niveau de protection s'ajuste à approximativement 25% du calibre du transformateur d'intensité.

Interchangeable rating plugs are removed with a rating plug removal tool, Catalog No. TRTOOL. (Suitable equivalents are commercially available as “integrated circuit (DIP) extractors.”) Grasp the rating plug tabs with the extractor and pull the plug out as illustrated in Figure 13. Be sure to grab the tabs and not the front cover of the rating plug, or the plug may be damaged.





Figure 13. Removing the interchangeable rating plug.

To install a rating plug, hold the plug between the thumb and forefinger, then push it into the Trip Unit. Proper engagement is verified by a click. Rejection features are provided on all rating plugs to prevent application mismatches. Never force a rating plug into place. Refer to Chapter 1 to find the appropriate rating plugs for each sensor rating and breaker frame.

Do not attempt to use a rating plug from a different type of Trip Unit in a Power+ Trip Unit.

### **4-3 Target Module Removal and Replacement**

The target module is removed with the rating plug removal tool, catalog number TRTOOL, also known as an integrated circuit (DIP) extractor. Grasp the tabs of the module with the tool, as shown in Figure 14. Be careful to hold the tabs and not the front cover, as the Target Module could be damaged otherwise. Gently pull the Target Module away from the Trip Unit. A gentle left-right motion assists the removal. Insure that the tabs are held securely until the Target Module is completely removed.

To install a target module, hold the module between the thumb and forefinger, then push it into the Trip Unit. Proper engagement is verified by a click.

#### **Target Module Battery Replacement**

To replace the two batteries in the Target Module, remove the module from the Trip Unit as described above. Slide the old batteries out from the battery compartment at the rear of the Target Module. It may help to carefully pry them out with a small screwdriver blade in the cutout on top of the module. Slide the new batteries into the battery



Figure 14. Removing the target module.

compartment. Be careful not to short out the batteries during removal or installation. Recommended replacement batteries are Panasonic CR1616, Eveready E-CR1616BP, and Duracell DC1616B.

**WARNING:** Replace the batteries with Panasonic CR1616, Eveready E-CR1616BP, or Duracell DC1616B only. Use of a different battery may present risk of fire, explosion, or damage to equipment. Observe proper battery polarity when installing in the battery compartment.

**AVERTISSEMENT:** Remplacer la batterie avec uniquement des Panasonic CR1616, Eveready E-CR1616BP, ou Duracell DC1616B. L'utilisation d'autres batteries peut présenter un risque de feu, d'explosion ou d'endommagement du matériel. Respecter la polarité de la batterie en l'installant dans son logement.

**WARNING:** The batteries may explode if mistreated. Do not recharge, disassemble, or dispose of in fire. Keep the battery away from children and dispose of the used battery promptly.

**AVERTISSEMENT:** La batterie peut exploser en cas de mauvaise utilisation. Ne pas la recharger, l'ouvrir ou la jeter dans un feu. Doit être gardé hors de portée des enfants. Une fois usée, la batterie doit être jeté rapidement.

**4-4 Trouble-Shooting Guide**

The following guide is provided for trouble-shooting and isolating common problems. It does not cover every possible condition. Contact the Customer Support Center at 800-843-3742 if the problem is not resolved by these procedures.

Symptom	Possible Cause	Corrective Action
<b>1.</b> The health monitor function of the optional target module does not operate.	Line current is below 20 % of the breaker sensor rating.	At least 20 % of the current sensor rating, <i>X</i> , must be flowing through the breaker to activate this function. If the load current is below this level, power the Trip Unit with the Test Kit or the Portable Battery Pack.
	The target module is not seated properly.	Verify that the target module is fully seated in its slot.
<b>2.</b> The trip indication target will not clear.	The target module batteries are low.	Replace the batteries in the target module.
<b>3.</b> The battery check (BAT) LED on the target module does not light.	The target module batteries are low.	Replace the batteries in the target module
<b>4.</b> The circuit breaker trips at too low a current.	The rating plug is not fully seated.	Verify that the rating plug is fully seated in its slot.
	An incorrect rating plug is installed.	Check the current rating and catalog number of the rating plug.

## NOTES



***GE Electrical Distribution & Control***

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*DEH179 R01 0298*

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