

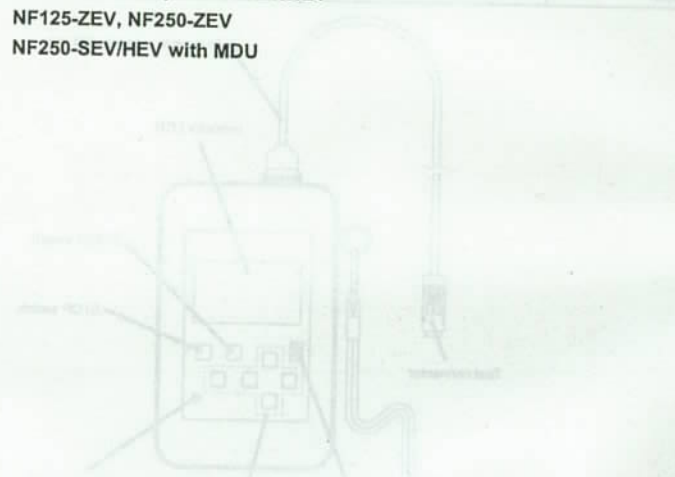
OPERATION CHECK & SETUP UNIT

Model

Y-350

Instruction Manual

Applicable types NF125-SEV/HEV, NF250-SEV/HEV
 (Breaker type Name) NV125-SEV/HEV, NV250-SEV/HEV
 NF125-ZEV, NF250-ZEV
 NF250-SEV/HEV with MDU



- Before use, read this Instruction Manual for proper and safe use.
- Deliver this Instruction Manual to the end user.

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1. Safety Precautions

- The marks used mean the following.

Caution	Wrong handling can cause dangerous situation in which possibility of significant or minor injuries or only impersonal damages is assumed.
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Caution

- This product (hereinafter called Y-350) shall be handled by a person having technical knowledge of electricity.
- Do not conduct a test when the line is hot. Doing so is dangerous because the breaker will trip and strike an arc.
- Do not use or store Y-350 in an abnormal environment where it is exposed to a high temperature/humidity, dust, and corrosive gas.
- Remove batteries if Y-350 is to be stored for a long time.
- Do not use secondary batteries (rechargeable batteries). Such batteries may catch fire or explode.
- Check if batteries are inserted correctly. Insert the negative terminal of the battery first.
- Do not mix different types, new and old batteries.
- Do not disassemble or short-circuit batteries. Do not put them into fire or charge them up.

2. Specification

Y-350 is a lightweight portable checker/setter for WS-V series electronic type breakers.

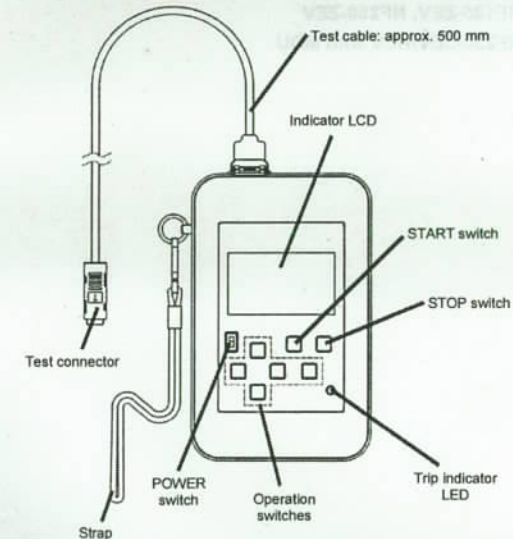
Y-350 can conduct simple operation check of trip relays and sets/monitors characteristic values in the field without turning on the power of breakers.

Item	Description
Operation test	Long Time Delay (hereinafter called LTD) trip test Pickup current test (Selectable from 30% to 600% of the rated current setting (I _r) in 1% steps.) Operating time test (Operation at 200% of the current setting (I _r))
	Short Time Delay (hereinafter called STD) trip test Operating time test (Operation at 150% of the STD pickup current I _s)
	Instantaneous (hereinafter called INST) trip test Operating time test (Operation at 1600% of the rated current I _n max)
	Pre-alarm operation test (Available only when the pre-alarm module (PAL) is equipped) Pickup current test (Selectable from 30% to 600% of the rated current setting (I _r) in 1% unit.) Operating time test (Operation at 200% of the current setting (I _r))
Characteristic setting	LTD operating time T _L (Selectable from 12, 60, 80 and 100 seconds.) LTD I ^t characteristic ON/OFF selection STD pickup current I _s (Selectable from 2, 2.5, 3, 3.5, 4, 5, 6, 7, 8, 9, 10 x I _r .) STD operating time T _s (Selectable from 0.1, 0.2 and 0.3 second.) STD I ^t characteristic ON/OFF selection N-pole protection ON/OFF selection (Selectable only for 4-pole breakers.)
* Refer to Page 13 for details of this item.	
Model information display	Rated current setting I _r LTD operating time T _L , Ramp characteristic of LTD (I ^t characteristics) ON/OFF STD pickup current I _s , STD operating time T _s , Ramp characteristic of STD (I ^t characteristics) ON/OFF N-pole protection ON/OFF INST pickup current I _i Pre-alarm pickup current I _p , Pre-alarm operating time T _p Earth leakage rated current sensitivity I _{ΔN} , Earth leakage Max. operating time T _e
LCD display (During operation test and characteristic setting/monitoring)	Test current display (displays in % or A), operating time display, various characteristic setting values display
Trip indicator LED	This LED lights up when a breaker trips during an operation test.
Power supply	AA sized dry-cell battery (1.5 V) x 4 Three types of operation test using new batteries (LTD operating time test, STD operating time test, Instantaneous operating time test): 100 times for each test. Total 300 times of test are possible.
Operating temperature range	0° to 40°C
Storage temperature range	-10° to 50°C (humidity of 85% RH or less)
External dimensions	96 (W) × 154 (D) × 33 (H) mm (excluding test cable and strap) Test cable length: 500 mm

3. Structure and Accessories

3.1 Names and functions of parts

Name	Function
(1) POWER switch	This is a power supply switch of Y-350. The menu is displayed on the indicator LCD by turning on this switch.
(2) Indicator LCD	This is a display screen of Y-350.
(3) Operation switches	There are five input switches: UP, DOWN, SELECT, RETURN and ENTER. They are used to switch the screen and determine items.
(4) START switch	When this switch is pressed during an operation test, current signals are output and the time counter starts counting up from zero. When this switch is pressed while the Model Information (ETR INFO.) screen is displayed, model information is read out from the breaker and the screen is updated.
(5) STOP switch	When this switch is pressed during an operation test, current signals are stopped and the time counter stops counting up. When this switch is pressed while the Model Information (ETR INFO.) screen is displayed, model information is read out from the breaker and the screen is updated.
(6) Trip indicator LED	This LED lights up when the breaker trips during a test.
(7) Test cable	This is a cable to connect a breaker to Y-350.
(8) Test connector	This is a connector to be inserted into a breaker.
(9) Strap	This is wrapped around the wrist for fall prevention.



3.2 Names and quantities of accessories

Before use, check the enclosed accessories.

AA sized dry-cell battery: 2 batteries x 2 (4 batteries in total)	Test cable * x 1	Instruction manual x 1
		This document

* You can purchase the test cable separately.

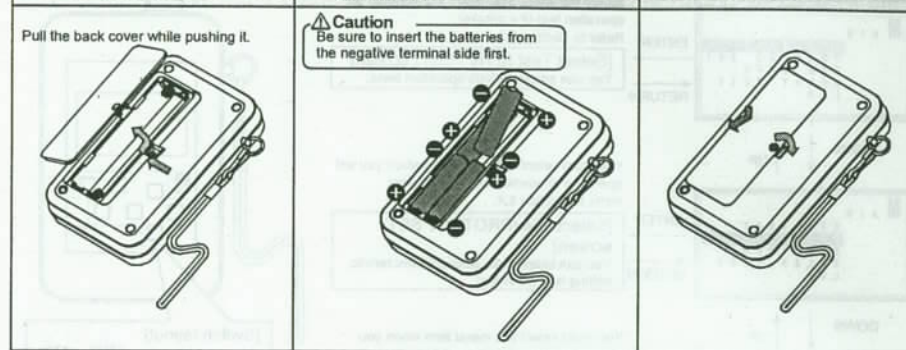
4. Before Use

4.1 Inserting batteries

Use four AA sized dry-cell batteries (1.5 V).

If Y-350 stops or "LOW BAT" is indicated, replace all of the four batteries with new ones.

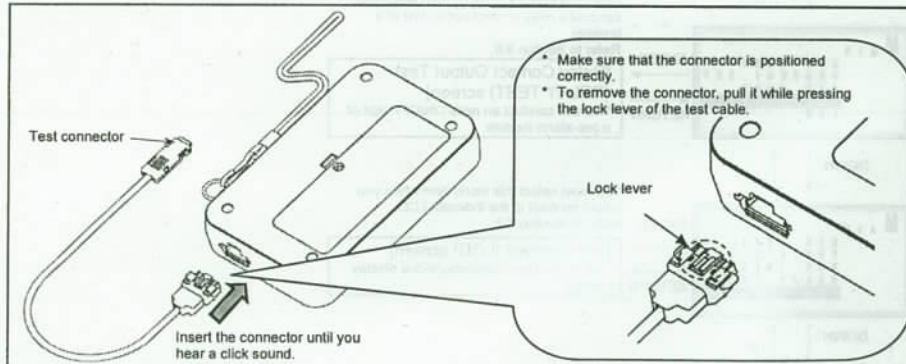
1. Remove the back cover.
2. Check the orientation of the batteries and insert them from the negative terminal first.
3. Attach the back cover.



4.2 Connecting the test cable

Connect the test cable.

When the test connector has been inserted and removed into/from breakers repeatedly 1,000 times or more, replace it with a new one. You can purchase the test cable separately. Contact your dealer to ask for the purchase of the test cable.



5. Usage

Remove the scratch-proof protection sheet from the indicator LCD of Y-350 before use.

5.1 Procedure and precautions for use

Y-350 should be used according to the following procedure (for testing and setting).

- (1) Connect the test connector to a breaker.
Open the test cover on the front side of the breaker and then insert the test connector. (Fig. 1)
The test connector should be positioned correctly, so do not insert it forcibly.
The test connector should be inserted in a way that the marking sticker of the test connector is headed to the power supply side of the breaker. (Fig. 2)
- (2) Turn on the breaker. If the breaker has tripped, reset the breaker and then turn it on.
- (3) Turn on the POWER switch of Y-350.
- (4) Conduct various tests and settings using Y-350.
- (5) Turn off the POWER switch to prevent battery drain after testing or setting.
When the POWER switch is turned off while the test screen is being displayed, that screen is displayed when the POWER switch is turned on next time.
This is useful when the same test is repeatedly conducted for multiple breakers. (Only the test screen is stored.)
- (6) Disconnect the test connector from the breaker.
After disconnecting the test connector, close the test cover of the breaker as it was before.

Fig. 1 Test connector insertion position

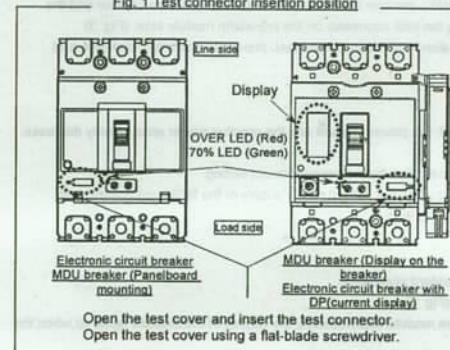


Fig. 2 Test connector insertion direction

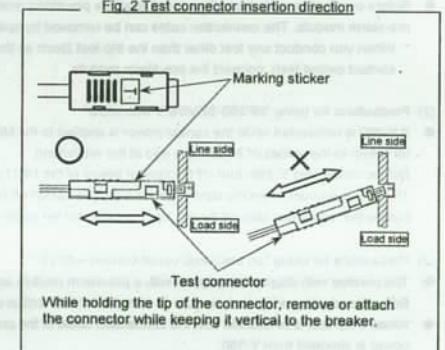
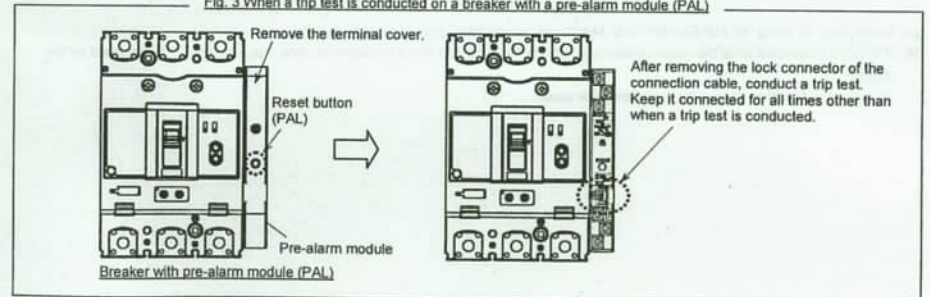


Fig. 3 When a trip test is conducted on a breaker with a pre-alarm module (PAL)



[Other precautions]

(1) Common precautions

- Do not slant the connector when attaching or removing the test connector to/from a breaker. (Fig. 2)
Doing so may break the test connector. Do not hold the cable but the tip of the test connector when attaching or removing the test connector.
- Do not use a test connector which has been attached and removed 1,000 times or more or a broken test connector for testing.
The operating time may become short, thus the pickup current may become low.
Remove the test cable from Y-350 and replace it with a new one. (Refer to Section 4.2 on Page 4.)
- If the test connector is attached or removed when the POWER switch of Y-350 is ON, OVER RED (Red) or 70% LED (Green) of the breaker may light up wrongly.
In this case, the backlight of the displays of "the MDU breaker" and "the breaker with display" turns red. (This will have no influence on the breaker operation.)
- Do not apply impact on Y-350 during testing. Doing so may abort the test and reset the display screen.
- Do not remove the test connector during testing. Doing so may light up the trip indicator LED of Y-350 wrongly.
- Batteries are burnt drastically when the test screen is on. If the indicator LCD is reset repeatedly, replace batteries with new ones.
- When you turn on the POWER switch, do not touch other switches (START/STOP switches, operation switches).
- When the POWER switch is instantaneously turned on and off, the stored screen may be reset.
- Before conducting a trip test with a breaker with a pre-alarm module (PAL), remove the connection cable between the breaker and the pre-alarm module. The connection cable can be removed by operating the lock connector on the pre-alarm module side. (Fig. 3)
* When you conduct any test other than the trip test (such as the pre-alarm operation current test, pre-alarm operating time test, and contact output test), connect the pre-alarm module.

(2) Precautions for using "NF250-SEV/HEV with MDU"

- If Y-350 is connected while the control power is applied to the MDU unit, the power amount and the reactive power amount may decrease (or return to the values of 30 minutes ago at the maximum).
Before connecting Y-350, turn off the control power of the MDU unit or set them by the power amount setting.
The power amount when the control power supply is turned off is stored when the control power supply of the MDU unit is turned off. Follow the Instruction Manual for the MDU breaker for the power amount setting.

(3) Precautions for using "an electronic circuit breaker with DP"

- The breaker with display is equipped with a pre-alarm module as a standard accessory.
Before conducting a trip test, be sure to remove the connection cable (Fig. 3)
- When a trip test is conducted with the connection cable of the pre-alarm module disconnected, the display of the breaker lights up when the power is supplied from Y-350.
After the test is completed, the display goes off to prevent battery drain. This has no influence on the breaker operation.

(4) Precautions for using "NF250-SEV/HEV with MDU" and "an electronic circuit breaker with DP"

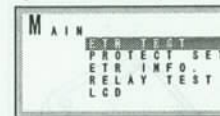
- If Y-350 is connected while the control power is applied to the MDU unit and a pre-alarm module, "Now Testing ..." is displayed on the display.
Note that the functions of the MDU unit cannot be used.

5.2 Menu selection

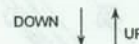
Select a menu item to be displayed by pressing the UP and DOWN switches. You can go to the screen of the selected menu item by pressing the ENTER switch.

You can return to the Main Menu screen by pressing the RETURN switch.

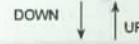
[Main Menu screen]



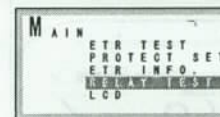
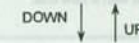
ENTER → [Select Test (ETR TEST) screen] You can select various operation tests. Refer to Section 5.3.
← RETURN



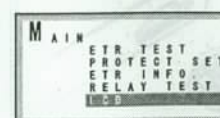
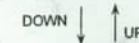
ENTER → [Select File (PROTECT SET) screen] You can select a file whose characteristic setting is to be stored. Refer to Section 5.4.
← RETURN



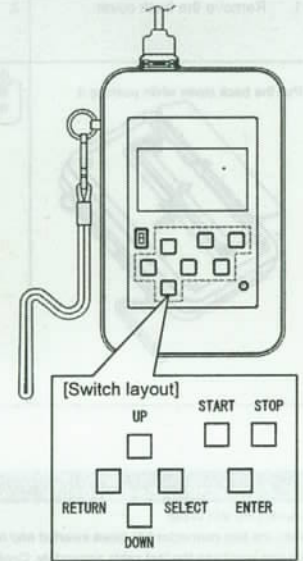
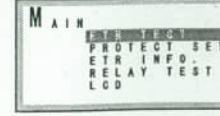
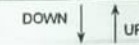
ENTER → [Model Information (ETR INFO.) screen] You can check model information and operating characteristics of a breaker. Refer to Section 5.5.
← RETURN



ENTER → [Relay Contact Output Test (RELAY TEST) screen] You can conduct a relay ON/OFF test of a pre-alarm module. Refer to Section 5.6.
← RETURN



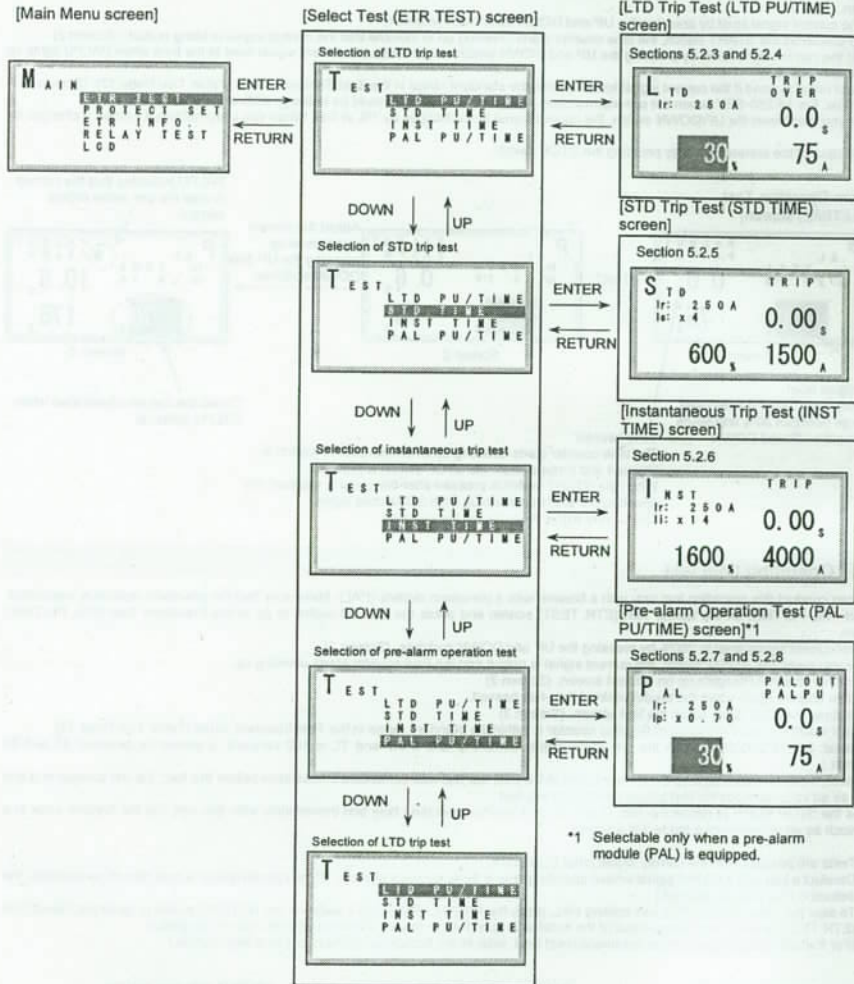
ENTER → [Set Contrast (LCD) screen] You can set the brightness of the display screen. Refer to Section 5.7.
← RETURN



5.3 Test method

5.3.1 Test selection method

Select ETR TEST from the Main Menu screen and press the ENTER switch. Then the Select Test (ETR TEST) screen appears. Select a test item by pressing the UP and DOWN switches. You can go to the selected test screen by pressing the ENTER switch.

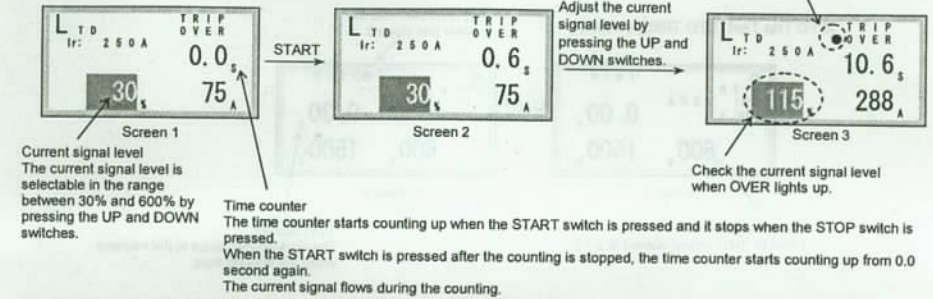


5.3.2 LTD trip test

5.3.2.1 Pickup current test

- Select LTD PU/TIME on the Select Test (ETR TEST) screen and press the ENTER switch to go to the LTD Trip Test (LTD PU/TIME) screen.
- Set the current signal level by pressing the UP and DOWN switches. (Screen 1)
Note that if the current signal level you set is too high, the breaker will trip in a short time.
(Example: For NF250-SEV, if the current signal level is set to 600% when TL is 100 seconds, the breaker will trip in about 10 seconds.)
- When you press the START switch, the time counter starts counting up to indicate that the current signal is being output. (Screen 2)
- Adjust the current signal level by pressing the UP and DOWN switches and check the current signal level at the time when OVER lights up on the screen.
The test result is good if the current signal level is within the standard range shown in the Test Standard Table (Table 1 on Page 12). (Screen 3)
(Example: For NF250-SEV, it should be between 105% and 125%.)
- When you hold down the UP/DOWN switch, the current signal level changes by 1% at first. When you keep holding it further, it changes by 10%.
- Stop output of the current signal by pressing the STOP switch.

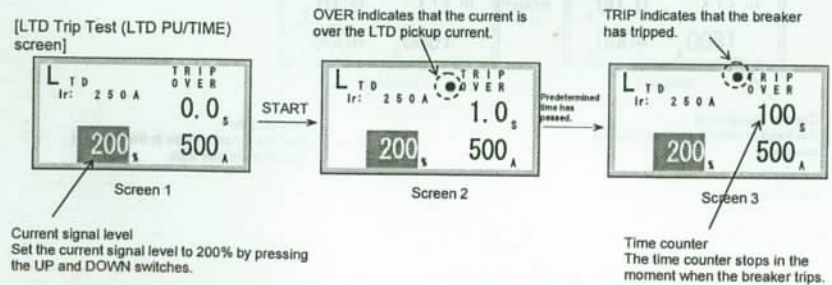
[LTD Trip Test (LTD PU/TIME) screen]



5.3.2.2 Operating time test

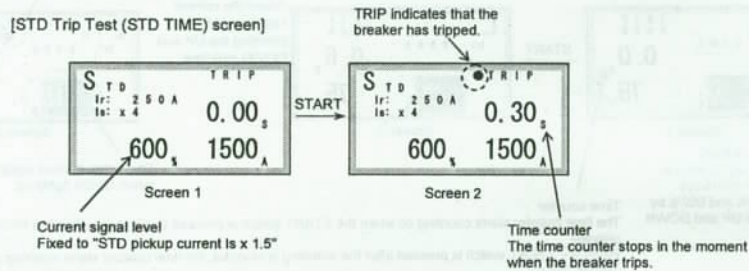
- Select LTD PU/TIME on the Select Test (ETR TEST) screen and press the ENTER switch to go to the LTD Trip Test (LTD PU/TIME) screen.
- Set the current signal level to 200% by pressing the UP and DOWN switches. (Screen 1)
- When the START switch is pressed, the current signal is output and the time counter starts counting up. At this time, OVER lights up on the test screen. (Screen 2)
- When the predetermined time has passed, the breaker trips and the time counter stops counting. At this time, TRIP on the test screen and the trip indicator LED of Y-350 light up. (Screen 3)
- The test result is good if the value of the time counter is within the standard range shown in the Test Standard Table (Table 1 on Page 12). (Example: For NF250-SEV, when TL is 100 seconds, it should be between 80 and 120 seconds.) However, if any test such as an pickup current test of the LTD trip test was conducted immediately before this test, trip the breaker in a test such as an instantaneous trip test before conducting this test. Otherwise, a correct operating time may not be displayed.
- You can restart an operating time test by pressing the START switch after resetting the breaker and then turning it on again.
- Press the STOP switch to cancel the test. If you conduct another operating time test immediately after this test, trip the breaker once in a test such as an instantaneous trip test in advance.

* Tests are possible with the current signal other than 200%.



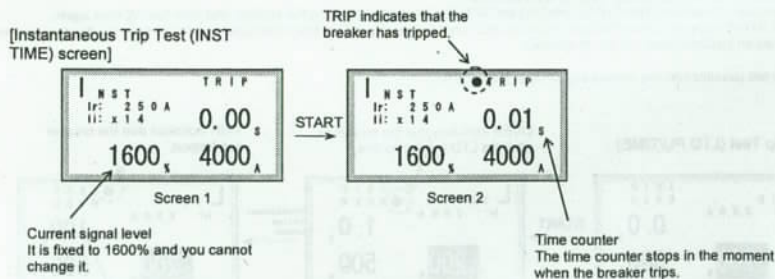
5.3.3 STD trip test (operating time test)

- Check the setting value of the instantaneous pickup current I_i before conducting this test. When the setting value is equal to or lower than "the setting value of STD pickup current $I_s \times 1.5$," an instantaneous trip operation may occur, thus the STD operating time may not be displayed. (Example: For NF250-SEV, when I_r is 250 A, I_s is $4 \times I_n$, and I_i is $5 \times$ reference current, I_s is 1000 A and I_i is 1250 A. In this case, the current signal level is " $I_s \times 1.5 = 1500$ A," which is over the instantaneous pickup current, thus 0.01 second is displayed for the operating time.)
- Select STD TIME on the Select Test (ETR TEST) screen and press the ENTER switch to go to the STD Trip Test (STD TIME) screen. You cannot change the current signal level in this mode. (Screen 1)
 - When you press the START switch, the current signal is output and the breaker trips. At this time, TRIP on the test screen and the trip indicator LED of Y-350 light up. (Screen 2)
 - The test result is good if the value of the time counter is within the standard range shown in the Test Standard Table (Table 1 on Page 12). (Example: For NF250-SEV When T_s is 0.3 seconds, it should be between 0.22 and 0.34 seconds.)
 - When you reset and turn on the breaker and then press the START switch, you can conduct a STD trip test again.
 - Press the STOP switch to cancel the test. When you conduct another STD trip test immediately after this test, trip the breaker once in a test such as an instantaneous trip test in advance.



5.3.4 Instantaneous trip test (operating time test)

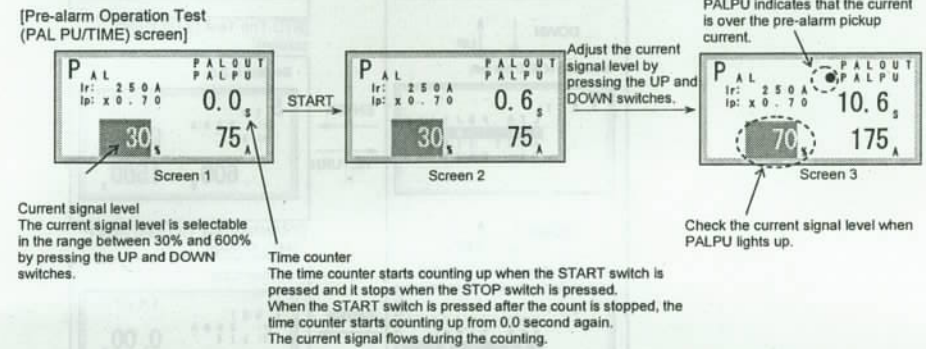
- Select INST TIME on the Select Test (ETR TEST) screen and press the ENTER switch to go to the Instantaneous Trip Test (INST TIME) screen. You cannot change the current signal level in this mode. (Screen 1)
- When you press the START switch, the current signal is output and the breaker trips. At this time, TRIP on the test screen and the trip indicator LED of Y-350 light up. (Screen 2)
- The test result is good if the value of the time counter is within the standard range shown in the Test Standard Table (Table 1 on Page 12). (Example: For NF250-SEV, it should be between 0.01 and 0.02 seconds.)
- When you reset and turn on the breaker and then press the START switch, you can conduct an instantaneous trip test again.



5.3.5 Pre-alarm operation test

5.3.5.1 Pickup current test

- You can conduct this operation test only with a breaker with a pre-alarm module (PAL). Make sure that the pre-alarm module is connected.
- Select PAL PU/TIME on the Select Test (ETR TEST) screen and press the ENTER switch to go to the Pre-alarm Test (PAL PU/TIME) screen.
 - Set the current signal level by pressing the UP and DOWN switches. (Screen 1)
 - When you press the START switch, the time counter starts counting up to indicate that the current signal is being output. (Screen 2)
 - Adjust the current signal level by pressing the UP and DOWN switches and check the current signal level at the time when PALPU lights up on the test screen. The test result is good if the current signal level is within the standard range in the Test Standard Table (Table 1 on Page 12). (Screen 3) (Example: For NF250-SEV, when the pre-alarm pickup current I_p is $I_r \times 0.7$, it should be between 60% and 80%.)
 - When you hold down the UP/DOWN switch, the current signal level changes by 1% at first. When you keep holding it further, it changes by 10%.
 - Stop output of the current signal by pressing the STOP switch.



5.3.5.2 Operating time test

- You can conduct this operation test only with a breaker with a pre-alarm module (PAL). Make sure that the pre-alarm module is connected.
- Select PAL PU/TIME on the Select Test (ETR TEST) screen and press the ENTER switch to go to the Pre-alarm Test (PAL PU/TIME) screen.
 - Set the current signal level to 200% by pressing the UP and DOWN switches. (Screen 1)
 - When you press the START switch, the current signal is output and the time counter starts counting up. At this time, the PALPU lights up on the test screen. (Screen 2)
 - The time counter stops when the predetermined time has passed. At this time, PALOUT lights up on the test screen. (Screen 3)
 - The test result is good if the value of the time counter is within the standard range in the Test Standard Table (Table 1 on Page 12). (Example: For NF250-SEV, when the pre-alarm pickup current I_p is $I_r \times 0.7$ and TL is 100 seconds, it should be between 40 and 80 seconds.)
 - However, if any test such as a pickup current test of the LTD trip test was conducted immediately before this test, trip the breaker in a test such as an instantaneous trip test before conducting this test.
 - Press the STOP switch to cancel the test. If you conduct another operating time test immediately after this test, trip the breaker once in a test such as an instantaneous trip test in advance.
- Tests are possible with the current signal other than 200%.
 - Conduct a test with a current signal whose operating time is three seconds or more. (If the operating time is less than three seconds, the detection time may be delayed.)
 - To stop the alarm output of the self-holding PAL, press the PRE-ALARM RESET switch or the RETURN switch to go to the Select Test (ETR TEST) screen. The alarm output of the automatic reset PAL automatically stops after the test is completed. (For the self-holding type and the automatic reset type, refer to the Instruction Manual for Pre-alarm Module.)

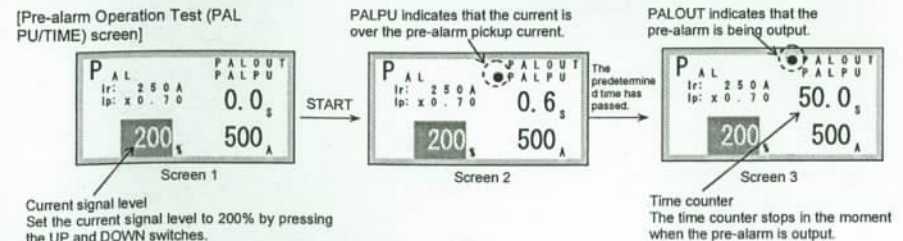


Table 1 Test Standard Table

Breaker model	LTD trip test		STD trip test		
	Pickup current test	Operating time test		Operating time test	
	Pickup current range (%)	LTD operating time TL setting value (s)	200% operating time range (s)	STD operating time Ts setting value (s)	STD operating time range (s)
NF125-SEV/HEV NF250-SEV/HEV NV125-SEV/HEV NV250-SEV/HEV NF125-ZEV NF250-ZEV	105-125	12	9.6-14.4	0.1	0.05-0.11
60		48-72	0.2	0.14-0.22	
80		64-96	0.3	0.22-0.34	
100		80-120			

Breaker model	Instantaneous operating time test	Pre-alarm operation test			
	Instantaneous operating time range (s)	Pickup current test		Operating time test	
		Pre-alarm pickup current Ip setting value (x Ir)	Pickup current range (%)	Pre-alarm operating time Tp = TL/2 setting value (s)	200% operating time range (s)
NF125-SEV/HEV NF250-SEV/HEV NV125-SEV/HEV NV250-SEV/HEV NF125-ZEV NF250-ZEV	0.01-0.02	0.70	60-80	6	4.8-7.2
0.75		65-85			
0.80		70-90	30	24-36	
0.85		75-95			
0.90		80-100	40	32-48	
0.95		85-105			
1.0	90-110	50	40-60		

5.4 Setting the operating characteristics

With Y-350, you can set the operating characteristics by editing the operating characteristics and sending them to the breaker. There are two operating characteristic setting methods as follows.

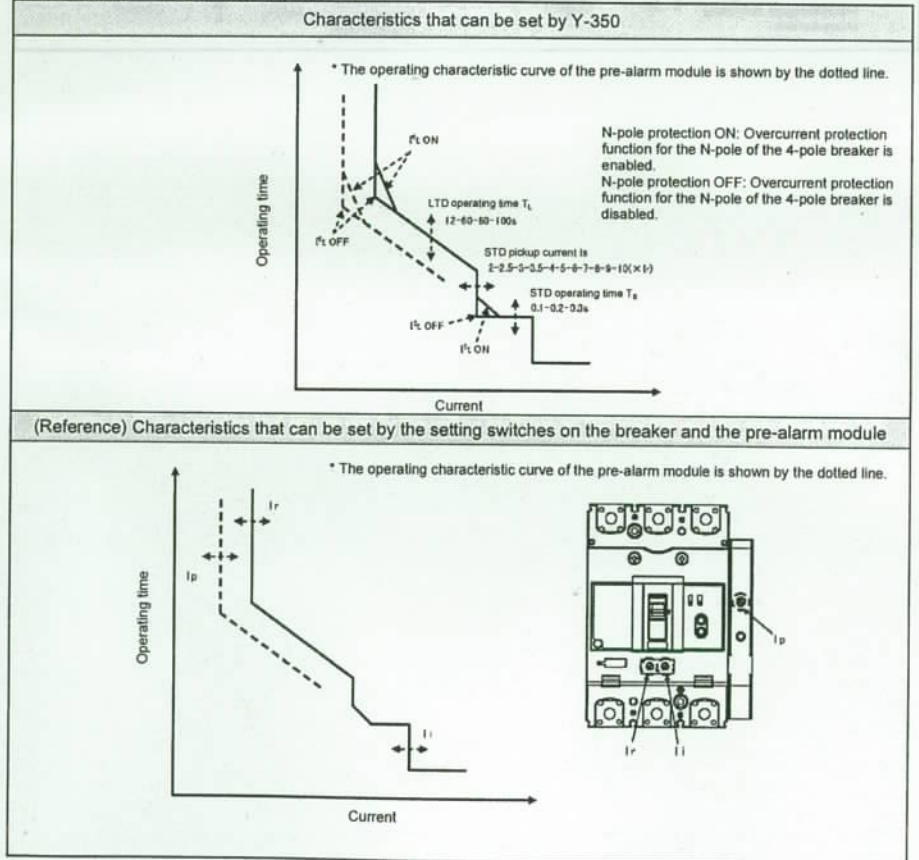
- Reading information from the connected breaker and changing its setting values.
(You can set the values while checking the present settings of the breaker. This method is for setting the characteristics unique to each breaker.)
- Sending the preset values stored in Y-350 to the breaker
(You can omit the setting value change operation when you set the same values to multiple breakers. Y-350 is able to store four patterns of setting information.)

5.4.1 Configurable operating characteristics

The configurable operating characteristics are as follows.

- LTD operating time TL (Selectable from 12, 60, 80, and 100 seconds.)
- LTD I^2t characteristic ON/OFF selection
- STD pickup current Is (Selectable from 2, 2.5, 3, 3.5, 4, 5, 6, 7, 8, 9, 10 x In.)
- STD operating time Ts (Selectable from 0.1, 0.2, and 0.3 second.)
- STD I^2t characteristic ON/OFF selection
- N-pole protection ON/OFF selection (Selectable only for 4-pole breakers.)

The following diagram shows the operating characteristic curves of the breaker that indicate the items that can be set by Y-350. The rated current Ir and the instantaneous pickup current Ii can be set with the setting switch on the breaker, while the pre-alarm pickup current Ip can be set with the setting switch on the pre-alarm module.

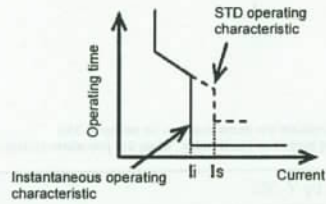


Precautions for setting the LTD pickup current I_s and the instantaneous pickup current I_i

* When the STD pickup current I_s is set to be equal to or larger than the instantaneous pickup current I_i , the STD operation does not occur.

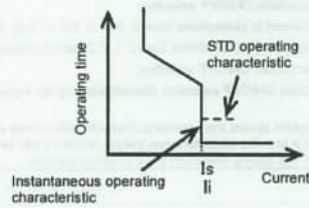
(1) When the STD pickup current I_s exceeds the instantaneous pickup current I_i :

Example: For NF250-SEV and when I_n is 250 A:
When " I_s is 3 x I_i " and " I_i is 2 x reference current," I_s becomes 750 A and I_i becomes 500 A, and the instantaneous trip operation occurs before the STD trip operation.
The operating characteristic curves are as shown in the following figure.



(2) When the STD pickup current I_s is equal to the instantaneous pickup current I_i :

Example: For NF250-SEV and when I_n is 250 A:
When " I_s is 3 x I_i " and " I_i is 3 x reference current," I_s becomes 750 A and I_i becomes 750 A, and the instantaneous trip operation occurs in priority to the STD trip operation.
The operating characteristic curves are as shown in the following figure.

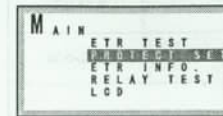


5.4.2 Selecting the characteristic setting method

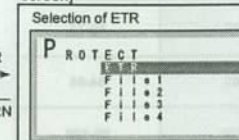
Select PROTECT SET on the Main Menu screen and press the ENTER switch to go to the Select File (PROTECT SET) screen. Pressing the UP and DOWN switches changes the menu items as follows: ETR→File 1→File 2→File 3→File 4→ETR.

[1] To read the setting information from the connected breaker to change the settings, select ETR.
[2] To make settings by sending the preset values stored in Y-350 to the breaker, select File 1, File 2, File 3, or File 4.
By pressing the ENTER switch on the Select File (PROTECT SET) screen, you can go to the Set Characteristics (PROTECT) screen of ETR or the file you selected.
By selecting ETR on the Select File (PROTECT SET) screen and pressing the ENTER switch, you can load the characteristic setting values of the currently connected breaker.

[Main Menu screen]



[Select File (PROTECT SET) screen]



Selection of File 1



Selection of File 2



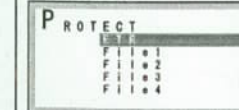
Selection of File 3



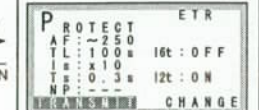
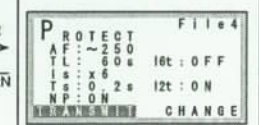
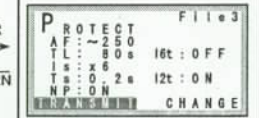
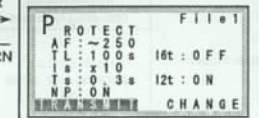
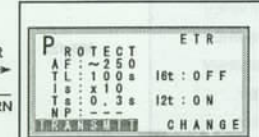
Selection of File 4



Selection of ETR



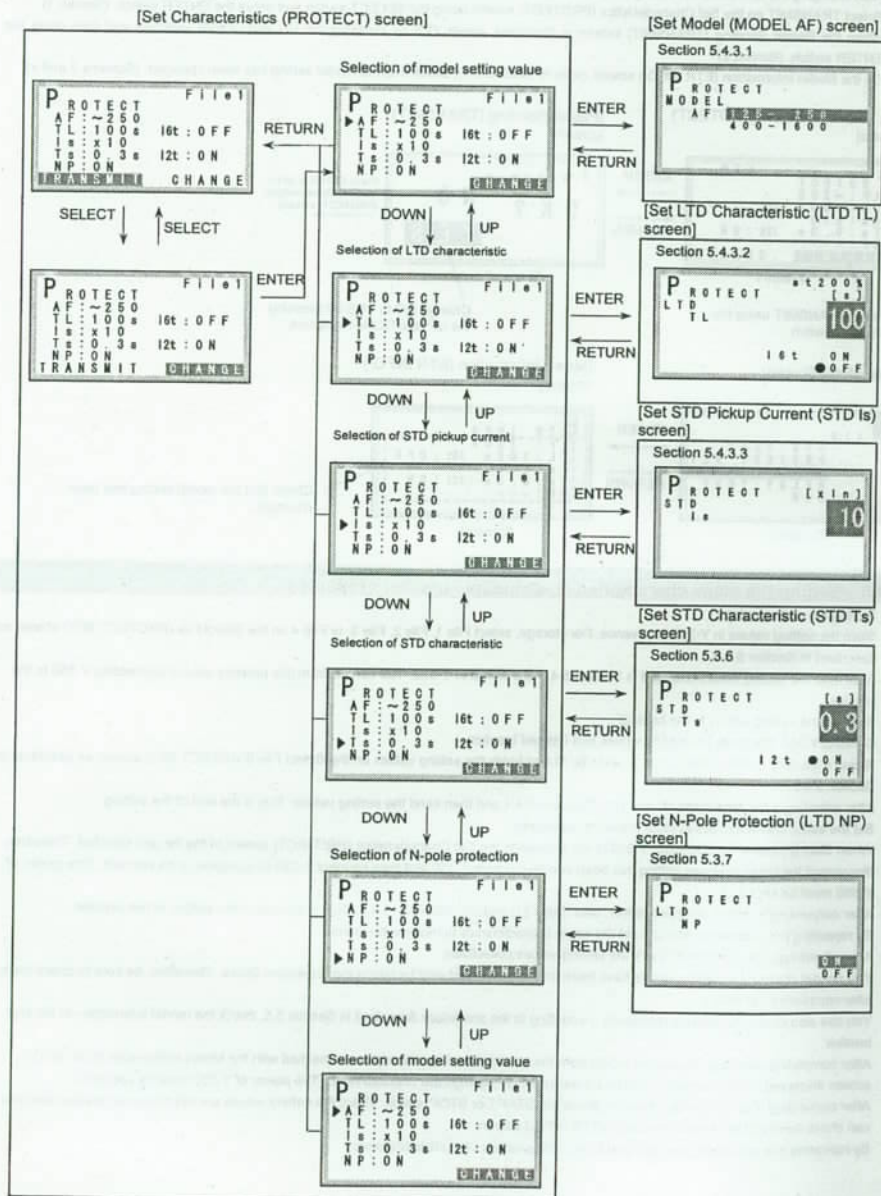
[Set Characteristics (PROTECT) screen]



5.4.3 Changing the characteristic setting values

Select CHANGE on the Set Characteristics (PROTECT) Screen by pressing the SELECT switch. By pressing the ENTER switch, you can select the characteristics. When you press the UP and DOWN switches, the selected items change as follows: AF⇄TL⇄Is⇄Ts⇄NP.

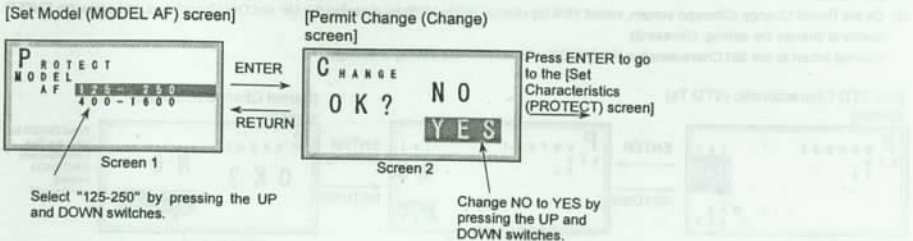
When you select ETR in Section 5.4.2, you cannot select AF. Also, if you select ETR in Section 5.4.2 and the breaker is not a 4-pole breaker, you cannot select NP. By pressing the ENTER switch when an item you want to change is selected, you can go to the Set Characteristics (PROTECT) screen of the selected item.



5.4.3.1 Changing the model setting value

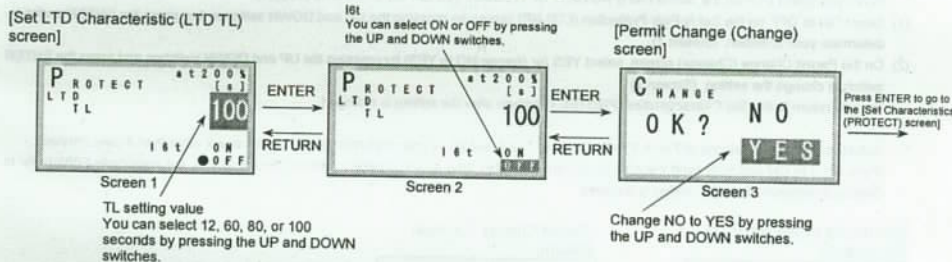
* You can set the model setting value by selecting File 1, File 2, File 3, or File 4 on the Select File (PROTECT SET) screen, but you must set it to "125-250."

- Select "125-250" on the Set Model (MODEL AF) screen by pressing the UP and DOWN switches and press the ENTER switch to determine your selection. (Screen 1)
 - On the Permit Change (Change) screen, select YES (or change NO to YES) by pressing the UP and DOWN switches and press the ENTER switch to change the setting. (Screen 2)
- You will return to the Set Characteristics (PROTECT) screen after the setting is changed.
- * If you select a wrong frame (400-1600) and send the setting data to the breaker (refer to Section 5.3.8), the error code "E003" (refer to Section 6) appears, thus this setting is disabled.



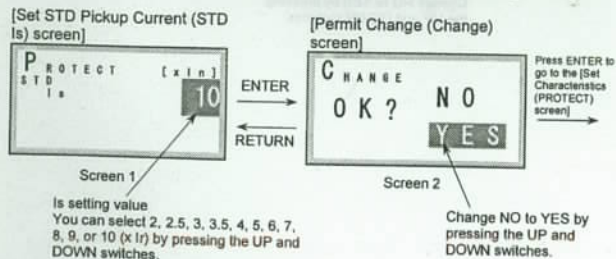
5.4.3.2 Changing the LTD operating characteristic (TL, I^t characteristic ON/OFF)

- You can change the LTD operating time TL using the Set LTD Characteristic (LTD TL) screen. When you press the UP and DOWN switches, the setting value changes as follows: 12⇄60⇄80⇄100. Press the ENTER switch to determine your selection. (Screen 1)
 - Next, ON/OFF of the I^t characteristic becomes changeable. To change the setting, select ON or OFF by pressing the UP and DOWN switches and press the ENTER switch to determine your selection. (Screen 2)
 - On the Permit Change (Change) screen, select YES (or change NO to YES) by pressing the UP and DOWN switches and press the ENTER switch to change the setting. (Screen 3)
- You will return to the Set Characteristics (PROTECT) screen after the setting is changed.



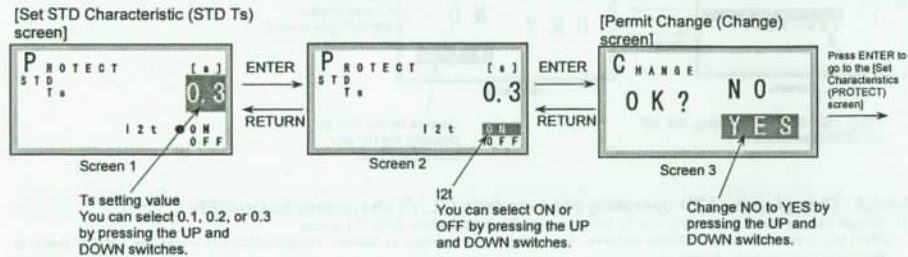
5.4.3.3 Changing the STD pickup current (Is)

- You can change the STD pickup current Is using the Set STD Pickup Current (STD Is) screen.
 - When you press the UP and DOWN switches, the setting value changes as follows: 2⇄2.5⇄3⇄3.5⇄4⇄5⇄6⇄7⇄8⇄9⇄10. Press the ENTER switch to determine your selection. (Screen 1)
 - On the Permit Change (Change) screen, select YES (or change NO to YES) by pressing the UP and DOWN switches and press the ENTER switch to change the setting. (Screen 2)
- You will return to the Set Characteristics (PROTECT) screen after the setting is changed.



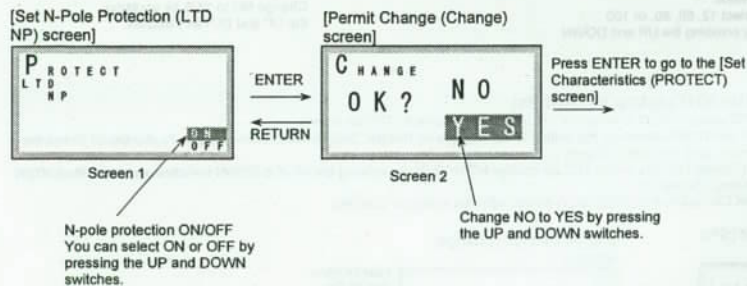
5.4.3.4 Changing the STD operating characteristic (Ts, I²t characteristic ON/OFF)

- You can change the STD operating time Ts using the Set STD Characteristic (STD Ts) screen.
When you press the UP and DOWN switches, the setting value changes as follows: 0.1↔0.2↔0.3. Press the ENTER switch to determine your selection. (Screen 1)
- Next, ON/OFF of the I²t characteristic becomes changeable.
To change the setting, select ON or OFF by pressing the UP and DOWN switches and press the ENTER switch to determine your selection. (Screen 2)
- On the Permit Change (Change) screen, select YES (or change NO to YES) by pressing the UP and DOWN switches and press the ENTER switch to change the setting. (Screen 3)
You will return to the Set Characteristics (PROTECT) screen after the setting is changed.



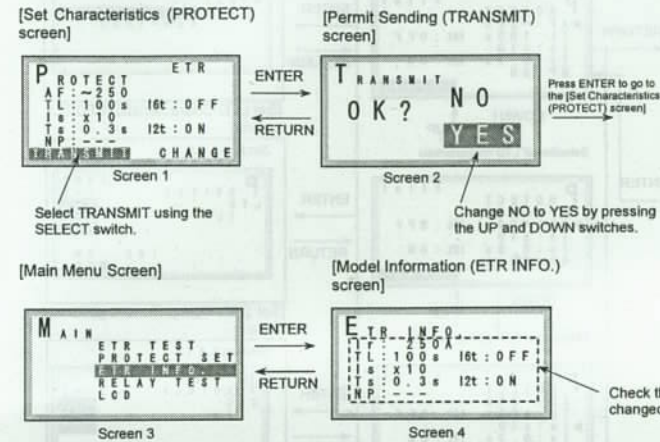
5.4.3.5 Changing the N-Pole protection setting

- You can set the N-pole protection by selecting File 1, File 2, File 3, or File 4 on the Select File (PROTECT SET) screen.
 - When you select ETR on the Select File (PROTECT SET) screen, you can set only 4-pole breakers.
- Select ON or OFF on the Set N-Pole Protection (LTD NP) screen by pressing the UP and DOWN switches and press the ENTER switch to determine your selection. (Screen 1)
 - On the Permit Change (Change) screen, select YES (or change NO to YES) by pressing the UP and DOWN switches and press the ENTER switch to change the setting. (Screen 2)
You will return to the Set Characteristics (PROTECT) screen after the setting is changed.
- Before changing the settings of File 1, File 2, File 3, or File 4, set the N-pole protection to OFF for breakers other than 4-pole breakers. If you set it to ON and then send the data to any breaker other than 4-pole breakers (refer to Section 5.3.8), the error code E003 (refer to Section 6) appears, thus this setting is disabled.



5.4.4 Sending the setting values

- You have not completed changing the characteristic setting values of the breaker yet when you changed only the characteristic setting values in Section 5.4.3. (Only the setting values of Y-350 have been changed.)
 - By sending the setting values to the breaker, you can actually change the setting values of the breaker.
 - After changing the characteristic setting values in Section 5.4.3, send them to the breaker.
- Select TRANSMIT on the Set Characteristics (PROTECT) screen using the SELECT switch and press the ENTER switch. (Screen 1)
 - When the Permit Sending (TRANSMIT) screen is displayed, select YES by pressing the UP and DOWN switches and then press the ENTER switch. (Screen 2)
 - On the Model Information (ETR INFO.) screen (refer to Section 5.4), check that the model setting has been changed. (Screens 3 and 4)

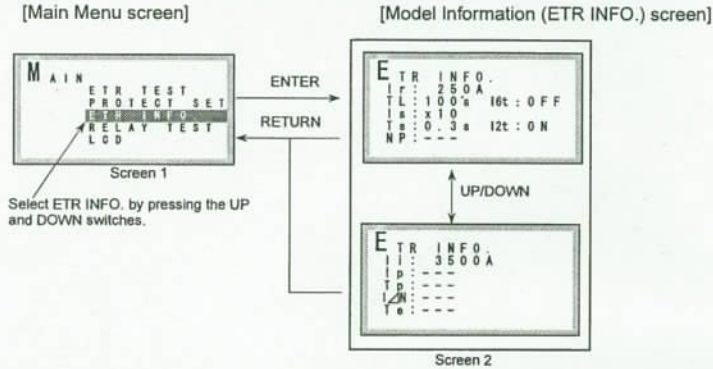


5.4.5 Setting the same characteristics to multiple breakers repeatedly

- Storing the setting values
Store the setting values in Y-350 in advance. For storage, select File 1, File 2, File 3, or File 4 on the Select File (PROTECT SET) screen as described in Section 5.4.2.
After that, the setting values changed in Section 5.4.3 are stored in Y-350. You can perform this process without connecting Y-350 to the breaker.
- Sending the setting values to the breaker
Connect Y-350 that holds the setting values to a desired breaker.
Select a file (any of File 1, File 2, File 3, and File 4) that holds the setting values on the Select File (PROTECT SET) screen as described in Section 5.4.2.
After selecting a file, take steps (1) and (2) of Section 5.4.4 and then send the setting values. This is the end of the setting.
- Set the same characteristics to other breakers repeatedly.
When Step (2) above is completed, Y-350 is still displaying the Set Characteristics (PROTECT) screen of the file you selected. Therefore, disconnect the breaker whose setting has been completed from Y-350 and then connect Y-350 to a breaker to be set next. (The power of Y-350 must be kept on.)
After connecting Y-350 to another breaker, take Steps (1) and (2) of Section 5.4.4. This is the end of the setting of this breaker.
By repeating this procedure, you can set the same characteristics to multiple breakers.
- After all settings are completed, check the setting values collectively.
You cannot check if the setting values have been properly changed only by taking the procedure above. Therefore, be sure to check them after completing the setting.
You can also check the settings repeatedly. According to the procedure described in Section 5.5, check the model information of the first breaker.
After completing checking, disconnect Y-350 from the breaker that has already been checked with the Model Information (ETR INFO.) screen displayed. Then, connect Y-350 to a breaker whose settings are checked next. (The power of Y-350 must be kept on.)
After connecting Y-350 to another breaker, press the START or STOP switch. Then, the setting values are read from the breaker and you can check them on the Model Information (ETR INFO.) screen.
By repeating this procedure, you can check the setting values of multiple breakers.

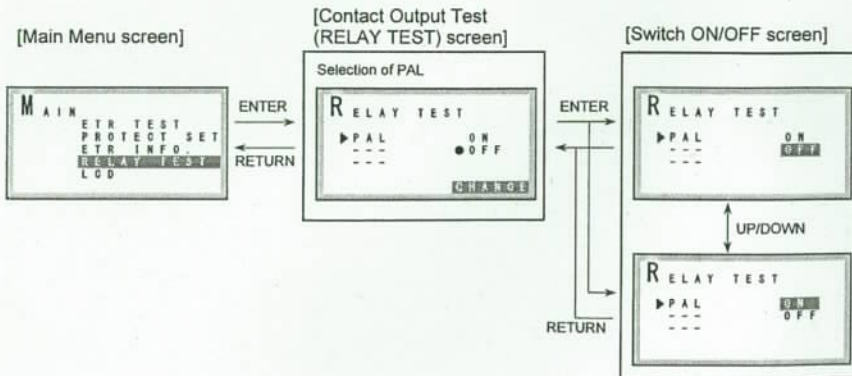
5.5 Displaying the model information

- Select ETR INFO. on the Main Menu screen by pressing the UP and DOWN switches and press the ENTER switch to go to the Model Information (ETR INFO.) screen. (Screen 1)
 - When the model information is displayed, change the Model Information (ETR INFO.) screen by pressing the UP and Down switches and check the characteristic setting values. (Screen 2)
 - You can return to the Main Menu screen by pressing the RETURN switch.
- When you press the START or STOP switch with the Model Information (ETR INFO.) screen displayed, the model information is read from the breaker again and the screen is updated.
(You can use this procedure while the Model Information (ETR INFO.) screen is displayed when you have changed the connected breaker or the setting values (Ir, Ii, and Ip) of the breaker.)



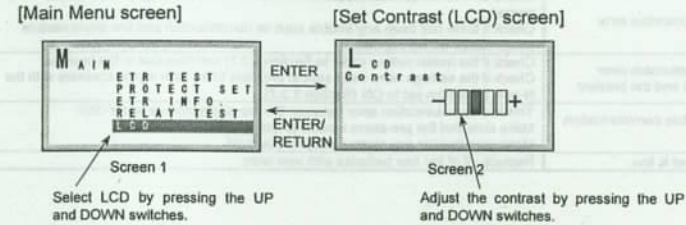
5.6 Contact output test

- You can perform the contact output test only with a breaker with a pre-alarm module (PAL).
 - Before conducting the contact output test, make sure that the pre-alarm module is connected and powered.
 - If no pre-alarm module is connected or no power is supplied, the error code E004 (refer to Section 6) appears.
- Select RELAY TEST on the Main Menu screen and press the ENTER switch to go to the Contact Output Test (RELAY TEST) screen. Press the UP and DOWN switches to select PAL. You can select ---, but if you select ---, the contact output test is not conducted even if you select ON on the Switch ON/OFF screen.
 - By selecting PAL and pressing the ENTER switch, you can go to the Switch ON/OFF screen. Select ON or OFF for output control (according to the screen display) by pressing the UP and DOWN switches.
- Note that if you exit the Contact Output Test (RELAY TEST) screen with the contact output set to ON, the contact output turns off.
Also note that the contact output is not reset even when you press the RESET button on the pre-alarm module with the contact output set to ON.



5.7 Setting the contrast of the Indicator LCD

- Select LCD on the Main Menu screen by pressing the UP and DOWN switches and press the ENTER switch to go to the Set Contrast (LCD) screen. (Screen 1)
- Adjust the LCD while checking the LCD screen contrast by pressing the UP and DOWN switches. The setting is applied while you adjust the contrast. (Screen 2)
- You can return to the Main Menu screen by pressing the ENTER/RETURN switch.



6. Troubleshooting

6.1 When you think Y-350 is in failure

Trouble	Cause and Troubleshooting	Reference
Nothing is displayed when the POWER switch is turned on.	Batteries may be inserted wrongly. Check if the batteries are inserted correctly.	Page 4
The display screen goes off during operation testing or characteristic setting.	Batteries may have been burnt or old batteries may be used. Replace them with new ones.	Page 4
When Y-350's test connector is connected to a breaker, OVER LED (red) or 70% LED (green) of the breaker lights up.	You may have inserted or removed the test connector with the POWER switch of Y-350 set to ON. If so, turn off the POWER switch of Y-350. This has no influence on the breaker operation.	Pages 5 and 6
When Y-350's test connector is connected to a breaker, the display of the MDU unit lights up red.		
In an operating time test, the breaker does not trip even when the predetermined time has passed. (For a breaker with a pre-alarm module (PAL))	Before conducting a test, remove the connection cable of the pre-alarm module.	Pages 5, 9, and 10
After an operation test is completed, the display of the breaker turns on and off repeatedly. (For a breaker with display)	To prevent battery drain, the display of the breaker goes out after an operation test is completed. This is not a breaker failure and has no influence on the breaker operation.	Page 6
Though the setting switches of the breaker and pre-alarm module have been changed, their settings are not applied to the Model Information (ETR INFO.) screen.	Press the START or STOP switch to update the display.	Page 20
In an LTD/STD trip operating time test, the breaker trips earlier than the predetermined time.	Check the following. • Did you conduct a pickup current test before conducting this test? If you did, trip the breaker once during a test such as an instantaneous trip test and then conduct this test again. • Check the STD pickup current Is and the instantaneous pickup current Ii. If Is is equal to or larger than Ii, the STD operation does not occur. • Check if the test cable is connected properly because it may not be connected properly. • The test cable may be deteriorated or broken. Replace the test cable with a new one when the test cable has been inserted and removed 1,000 times (as a guide).	Pages 4, 5, 9, 10, 11, and 14
In a pre-alarm operating time test, PALOUT lights up earlier than the predetermined time.	If none of the above applies to your case, the breaker may be in failure. In such a case, please contact your dealer.	

6.2 Error codes and troubleshooting

If an error occurs during operation, refer to the following table.

Error code	Description	Troubleshooting
E001	Breaker communication error	This is a communication error between the breaker and Y-350. Check if the test connector of Y-350 is properly connected to the breaker.
E002	Internal communication error	This is an internal communication error. Check if the operating environment is proper. Check if there has been any trouble such as disconnection and pre-alarm module power failure during operation.
E003	Setting value mismatch error between Y-350 and the breaker	Check if the model setting (refer to Section 5.3.3) matches that of the breaker. Check if the settings have been sent to breakers other than 4-pole breakers with the N-pole protection set to ON (Section 5.3.7).
E004	Pre-alarm module communication error	This is a communication error between the pre-alarm module and Y-350. Make sure that the pre-alarm module is connected to the breaker. Make sure that the pre-alarm module is powered.
LOW BAT	The battery level is low.	Replace all of the four batteries with new ones.

※ The above information is for reference only. For detailed information, refer to the manual.

(Faint, illegible table content)

