

MOLDED-CASE CIRCUIT BREAKERS EARTH-LEAKAGE CIRCUIT BREAKERS MCCB WITH EARTH LEAKAGE CURRENT ALARM INSTRUCTION MANUAL

Types NF125-SEV, NF125-HEV, NV125-SEV, NV125-HEV, NF125-ZEV
NF250-SEV, NF250-HEV, NV250-SEV, NV250-HEV, NF250-ZEV

1. Safety Precautions

- For correct operation, please go over this paper "Safety Precautions" beforehand. Be sure to follow the cautionary instructions given below.
- Requested to convey the requirements stated in this section "Safety Precautions" to the end users.

The marks used respectively mean the following.

| | |
|------------------|---|
| ⚠ DANGER | Wrong handling can cause dangerous situation in which possibility of fatal accidents or serious injuries is assumed. |
| ⚠ CAUTION | Wrong handling can cause dangerous situation in which possibility of significant or minor injuries or only impersonal damages is assumed. |

⚠ DANGER

- Don't touch the terminal. Electrification can result.

⚠ CAUTION

- Any electric work must be carried out by a qualified person (electrician).
- Maintenance and inspection must be practiced by a specialist having electrical knowledge. Turn off the upper circuit breaker and make sure of no current conducting to avoid possible electrification.
- At wire connection, fasten the terminal screws with the torque stated in the instruction manual. Fastening with incorrect torque can cause fire.
- Refrain from installing in abnormal environment such as high temperature, high humidity, high dust content, corrosive gas ambient, or of excessive vibration or impact. Electrification, fire, or operation failure can result.
- Carry out the work avoiding foreign matters such as dust, concrete powder, steel chips, and rain water to enter into the equipment. Otherwise, fire or operation failure can result.
- When the breaker cuts off automatically, turn it on after eliminating the cause. Otherwise, electrification and fire can result.
- Tighten the terminals regularly according. Otherwise, fire can take place.
- Be sure to earth all the electrical devices of the circuit.
- Circuit breaker dedicated to three phase 4-wire type, be sure to connect the neutral wire to the neutral phase. Open phase or overcurrent fails operation and causes fire.
- Connect the breaker to power source suitable for the ratings of the breakers. Connecting to a wrong power can cause malfunction and failure.
- Check operation of the earth-leakage circuit breaker and earth-leakage current alarm breaker once a month or so by pressing the test button. If it does not work, please get in touch with an electrician.
- Do not perform the insulation and the withstand voltage tests in the state below.
 - Between the right and left pole terminals of the load side.
 - Between the right and left pole terminals when the handle is in ON state. Otherwise, internal circuit of the breaker will be damaged.

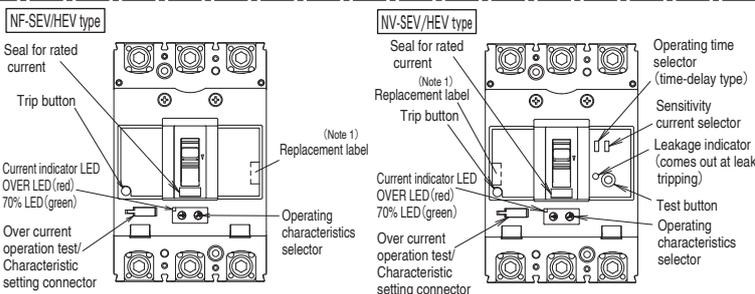
2. Instructions for installation

- Connect the line side and load side definitely, and perform the connection of the electric wire certainly. (Appropriate tightening torque of terminal screw : 8~13N · m)
- In the case of single-phase 2-wire system, connect the electric wire to the right and the left pole. [NV type and NF-ZEV type]
- The connections of line side and load side can not be reversed. [NF-ZEV type]
- This product is not earth-leakage circuit breaker. Therefore, if it is necessary to install the earth-leakage circuit breaker, this product can not be used.
- For the contacts capacity of earth leakage current alarm and the pre-alarm, refer to the right table.
- With the external reset terminal (option), do not impress the voltage from the outside, because these terminals are live parts.
- Install one switch to one external reset terminal. In this case, use the push-button switch make contact and automatic reset type. (Contact capacity: DC60V 10mA)
- The length of lead wire from the external reset terminal to the switch is adjusted to 10m or less.
- The tightening torque of the lead wire connected to the terminal block is 0.9~1.2N · m.

| | COSφ=1 | COSφ=0.4 L/R=0.007 |
|--------|--------|-----------------------|
| AC125V | 3A | 2A |
| AC250V | 3A | 2A |
| DC 30V | 2A | 2A |
| DC100V | 0.4A | 0.3A |

3. Instructions for use

- Before starting to use, check operation of this product by pushing the test button. Unless voltage is impressed, Test button does not function. (NV type only)
- Before starting to use, push the test button and confirm the earth leakage alarm function. After confirming the function, push the reset button to reset it. Also, if the voltage is not applied, the test button will not function. (NF-ZEV type only)
- Even in the unloaded condition, this product makes a little noise by voltage impression, but it is normal. This noise is made by actuating of the electronic circuit inside the breaker.
- The type of earth-leakage current alarm is self-holding type. Push the reset button or turn off the circuit breaker to reset the alarm. (With the external reset terminal (option), it enables reset to shunt the external reset terminals.)



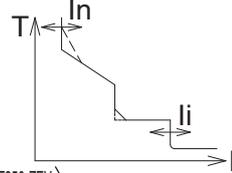
(Note 1) If the rated current I_n or characteristics of over current operation is changed, please use the replacement label for indicate.
(Note 2) External reset terminal is option

4. Setting method of the operating characteristics

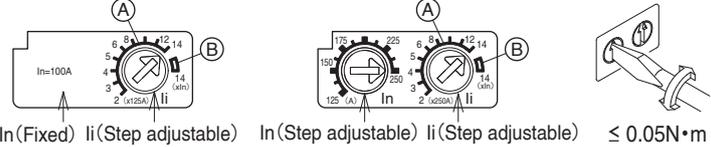
⚠ CAUTION

Before setting, turn off the upper circuit breaker, or turn off the circuit breaker to be set or trip the breaker, then make sure of no current conducting.

- Setting of Current setting, Instantaneous current
 - Change the value with turning the dial. Please use a slotted screwdriver show in the right figure below. A slotted screwdriver of 3mm width and 0.5mm thickness is suitable for setting. At setting refrain from applying force more than necessary as such can cause failures.
 - Take out the label for rated current from the inside of the breaker's left side. And stick the label to the position under the handle.



Types NF125-SEV, NF125-HEV and NF125-ZEV / Types NV125-SEV and NV125-HEV
Types NF250-SEV, NF250-HEV and NF250-ZEV / Types NV250-SEV and NV250-HEV



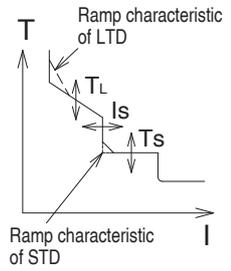
| Types | NF125-SEV, NF125-HEV, NF125-ZEV NV125-SEV, NV125-HEV | NF250-SEV, NF250-HEV, NF250-ZEV NV250-SEV, NV250-HEV |
|---|--|---|
| Max. rated current (A) | 125 | 250 |
| Rated current I_n (A) | 50 60 75 100 125 | 125-250 adjustable (Step adjustable at every 12.5A) |
| Instantaneous pick up current I_i (A) | Ⓐ 2-3-4-5-6-8-10-12-14 × Max. rated current Ⓑ 14 × Rated current I_n | |

- Setting method except Rated current and Instantaneous pick up
In the case of change the characteristic except Rated current and Instantaneous pick up, Change the setting with the Operation check & Set up unit "Y-350" (option).
If the Operation check & Set up unit "Y-350" is used, execute the test according to its manual.

| | |
|------------------------------|------------------------------------|
| LTD time : T_L | 12-60-80-100s (at 200% I_n) |
| STD pick up current : I_s | 2-2.5-3-3.5-4-5-6-7-8-9-10 × I_n |
| STD time : T_s | 0.1-0.2-0.3s |
| Ramp characteristic of LTD | ON (I^{1t}) - OFF (I^{2t}) |
| Ramp characteristic of STD | ON (I^{1t}) - OFF (FLAT) |
| Neutral pole protection : NP | ON (functional) - OFF (none) |

Under line . . . Setting for shipment

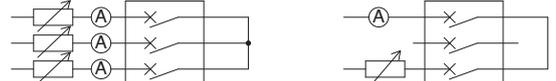
(Note 3) It can set only 4 pole type. (NF-SEV/HEV Type only)



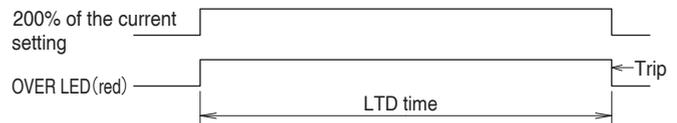
5. Testing method

Check operation with load current or using the Operation check & Set up unit "Y-350" (option).
If the Operation check & Set up unit "Y-350" is used, execute the test according to its manual.

- Apply AC current to the circuit-breaker from three-phase or single-phase power supply. In case of single-phase power supply, apply the current with any two poles in series.

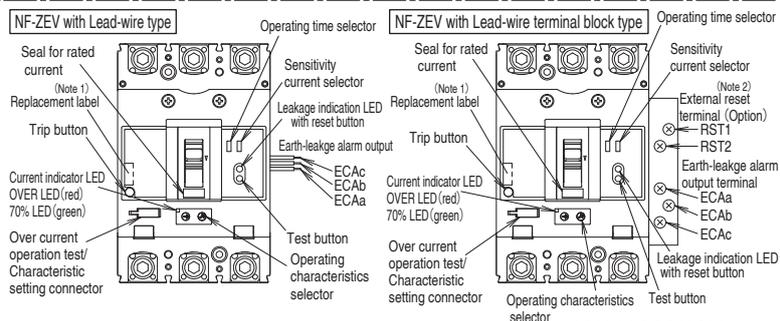


- Check following items by each LED in front of circuit breaker.
 - OVER LED (red) : LED lights among 105 to 125% of current setting.
 - 70% LED (green) : LED lights among 60 to 80% of current setting.
- LTD operating time can be checked by load current equivalent to 200% of the current setting. If operating current of circuit breaker is measured just before this test, operating time is shorter. In this case, please measure again after circuit breaker is tripped.



The result is good if the operating time measured falls within the following range.

| Setting of LTD time T_L | $T_L=12s$ | $T_L=60s$ | $T_L=80s$ | $T_L=100s$ |
|---------------------------|-----------|-----------|-----------|------------|
| LTD operating time | 9.6~14.4s | 48~72s | 64~96s | 80~120s |



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