JUTRION

# AFDD ARC-FAULT DETECTION DEVICE

## INSTALLATION AND INSTRUCTION MANUAL

**Read this manual carefully before installation and use, and keep it for future reference.**

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# SAFETY INFORMATION

1. Do not install this product in areas containing flammable gases or in damp/condensing environments. Never operate it with wet hands.
2. Do not install or use the product where it is exposed to rain or snow.
3. Never test product performance by directly contacting live conductors or by short-circuiting line and neutral.
4. Disconnect the power supply before installation, maintenance or servicing.
5. Use an appropriately rated circuit breaker for overload and earth-leakage protection.
6. Wiring and installation must be performed by qualified personnel and inspected periodically.
7. Keep the product and its packaging out of the reach of children.
8. Prevent foreign objects from entering the product.
9. Do not install where gases may corrode metal parts or damage insulation.
10. Tighten terminals securely. Conductors must not be loose or pull out. Select supply and load conductors according to the specified requirements.
11. This product does not protect against electric shock caused by simultaneously touching line and neutral conductors.

# 1. OVERVIEW

The AFDD series complies with GB/T 31143-2014 for arc-fault protection devices. It combines overload, short-circuit, residual-current and over/undervoltage protection. By detecting arc faults and disconnecting the supply before an electrical fire develops, it helps protect people and property.

# 2. MODEL DESIGNATION

Device

Detection

Fault

Arc

# 3. USE, INSTALLATION & STORAGE CONDITIONS

3.1 Service conditions

- Ambient temperature: -35°C to +70°C; the 24-hour average shall not exceed +35°C. When the operating temperature exceeds +30°C, correct the residual-current rating using Table 1.
- Altitude: not more than 2000 m.
- Pollution degree: 2.
- Degree of protection: IP20.
- Installation categories: II and III.

3.2 Installation

Install where there is no significant shock or vibration and where rain or snow cannot enter.

3.3 Transport and storage

Protect from rain and snow, avoid severe impact and vibration, and keep away from corrosive media during transport and storage.

Table 1 Rated-current temperature correction factors

| Rated current (A) | -35 | -20 | -10 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 1.45 | 1.40 | 1.30 | 1.23 | 1.15 | 1.08 | 1 | 0.98 | 0.96 | 0.93 | 0.91 |
| 10-25 | 1.27 | 1.24 | 1.19 | 1.13 | 1.08 | 1.04 | 1 | 0.98 | 0.95 | 0.92 | 0.89 |
| 32-40 | 1.27 | 1.24 | 1.19 | 1.13 | 1.08 | 1.04 | 1 | 0.97 | 0.92 | 0.89 | 0.87 |
| 50-63 | 1.26 | 1.25 | 1.18 | 1.13 | 1.08 | 1.03 | 1 | 0.95 | 0.90 | 0.86 | 0.84 |

# 4. MAIN TECHNICAL PARAMETERS AND PERFORMANCE

4.1 Main technical data are shown in Table 2.

Table 2 Main technical data

| Model | Poles | N pole | Frequency Hz | Rated current In (A) | Rated voltage Un (V) | Breaking capacity Icn (A) | At 6A | At 10A | At 20A | Instantaneous | Trip curve |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AFDD | 1 | N | 50 | 6 / 10 / 16 / 20 | 230 | 6000 | 1 s | 0.5 s | 0.25 s | 0.15 s | C |

Note: The operating times above apply when tested with a resistive load. With a motor load, the operating time is 2.5 times the value shown.

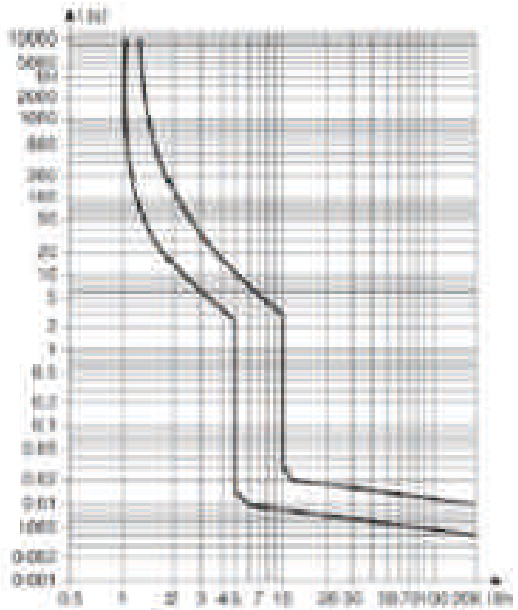
| No. | Parameter / performance | Value |
|---|---|---|
| 1 | Rated voltage (Un) | AC230V |
| 2 | Instantaneous trip curve | B, C, D |
| 3 | Rated residual operating current IΔn | AC type: 0.03A |
| 4 | Rated short-circuit capacity Icn | 6000A |
| 5 | Self-test content | Electronic associated components |
| 6 | Self-test interval | 108 min |

## 4.2 Mechanical and electrical endurance

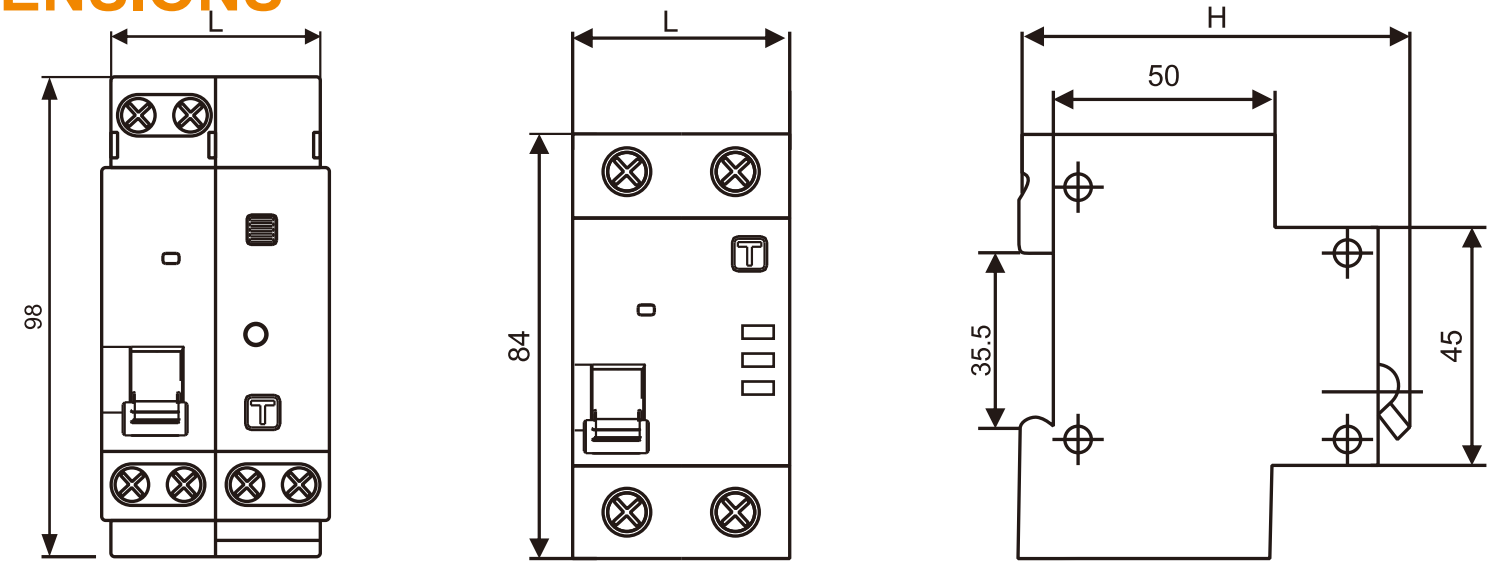
Mechanical and electrical endurance: 4,000 operating cycles.

4.3 The circuit-breaker protection characteristic curve is shown in Figure 3.

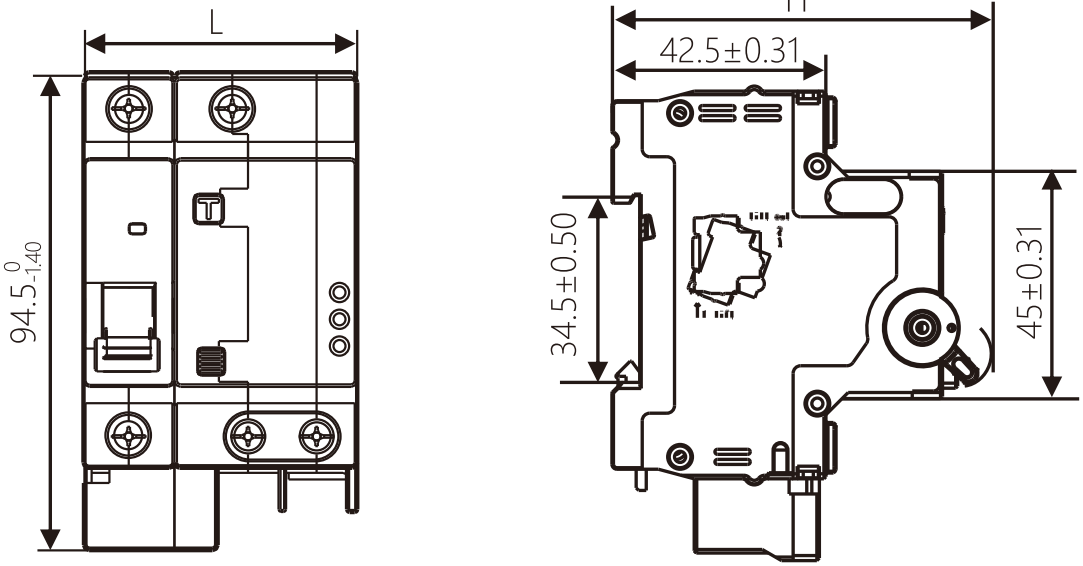
TRIPPING TIME CHARACTERISTIC



# 5. OVERALL AND INSTALLATION DIMENSIONS



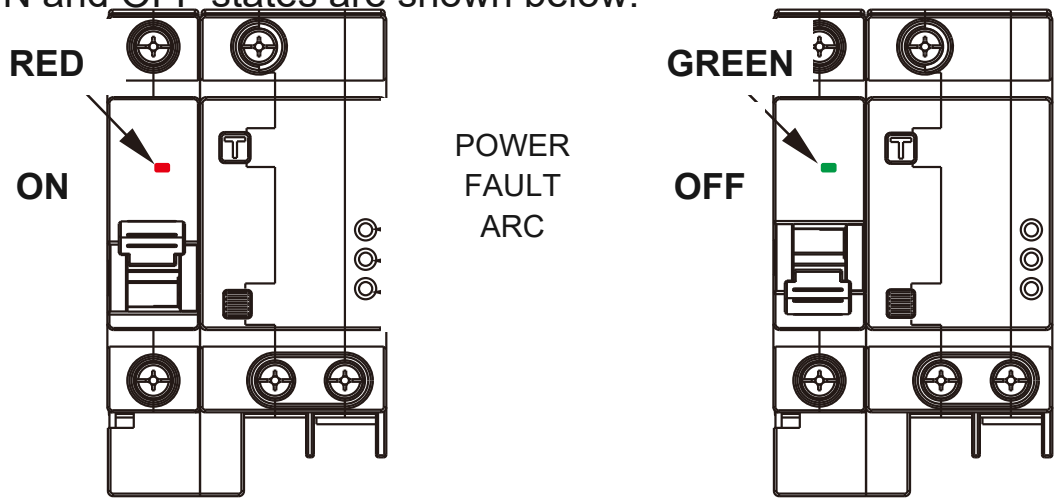

| Poles | L (mm) | | H (mm) |
|---|---|---|---|
| | Inm=32 | Inm=40 | |
| 1P+N | 36 | 36 | 76.8 |
| 2P | 36 | 36 | 77.8 |



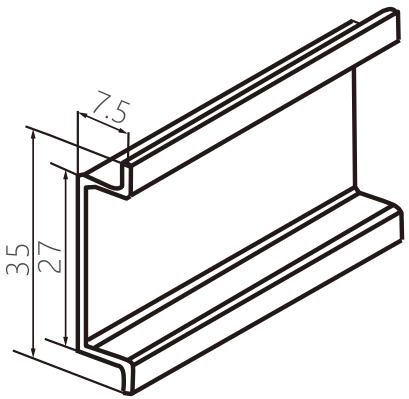

| Poles | L (mm) | H (mm) |
|---|---|---|
| | **Inm=63** | |
| 1P+N | 54 | 76.8 |
| 2P | 72 | 77.8 |
| 3P | 103.5 | 77.8 |
| 3P+N | 117 | 77.8 |
| 4P | 135 | 77.8 |

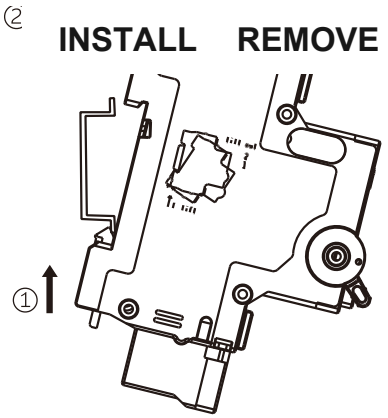
# 6. INSTALLATION, COMMISSIONING & OPERATION

6.1 Before installation, verify that the circuit-breaker markings match the intended operating conditions. The ON and OFF states are shown below.



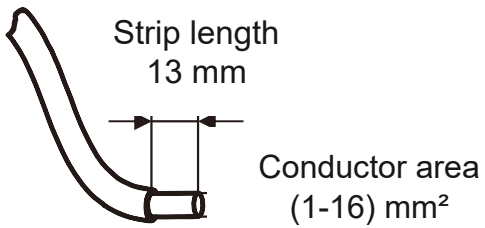

6.2 Use a TH35-7.5 DIN rail. Installation and removal are shown below.

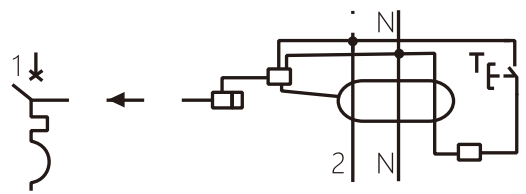


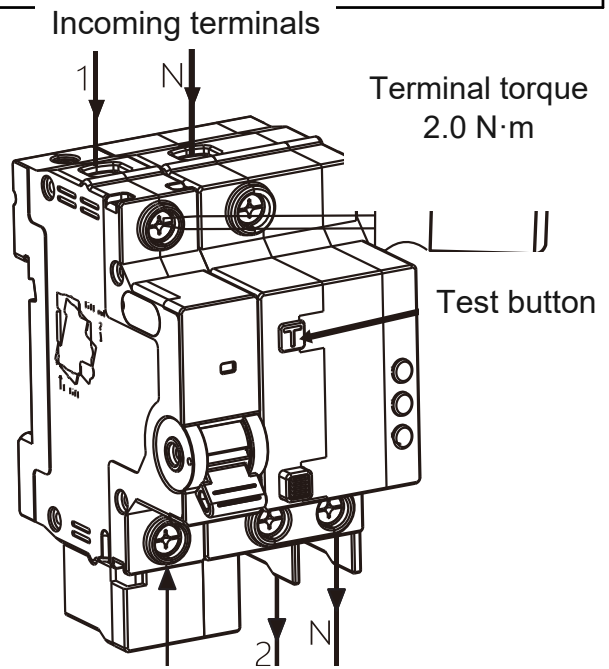



6.3 Copper conductors shall be used. Select conductor cross-sectional area according to Table 3. Wiring is shown below.

| Rated current In (A) | Copper conductor (mm²) | Rated current In (A) | Copper conductor (mm²) |
|---|---|---|---|
| 6 | 1.0 | 32 | 6.0 |
| 10 | 1.5 | 40, 50 | 10.0 |
| 16, 20 | 2.5 | 63 | 16.0 |
| 25 | 4.0 | | |




Note: Ensure that the plug-in conductor connections are correct. The incoming terminals must be connected to the power supply and the outgoing terminals to the load. After wiring, check that the manual operating handle moves freely.

External handle linkage

# 7. FAULT ANALYSIS AND TROUBLESHOOTING

| Fault symptom | Possible cause | Corrective action / prevention |
|---|---|---|
| Handle will not reset | Short circuit in the circuit / residual current exists / arc fault exists | Check the circuit, clear the fault and operate again |
| Frequent tripping | Load current exceeds breaker rating / residual current exists / wiring terminal loose | Reduce the load or select a suitable breaker; check circuit and terminals |
| Test button does not operate | Poor contact at wiring terminal / button failure | Tighten terminal screws / replace product |
| Terminal overheats | Terminal screw loose / selected conductor too small | Tighten terminal screws / use a conductor of suitable cross-section |
| Fault indicator remains ON | Product self-test or protection function abnormal / fault has not been cleared | Operate the product. If the indication remains, replace it / clear the fault and retry |
| Electrical indicator remains ON | Delay caused by fault interruption | Press the T button, then reset |
| Electrical indicator flashes | Entered learning mode | Press and hold T for 10 seconds to clear |

# 8. MAINTENANCE

8.1 Inspect the circuit breaker regularly during operation.
8.2 If tripping occurs due to overload, overcurrent, residual current or an arc fault, clear the fault before resetting and closing the breaker.

# 9. WARRANTY, ENVIRONMENT & LEGAL PROVISIONS

9.1 Warranty
Under normal transport and storage conditions, and provided that the product packaging or the product itself is intact, the product is warranted for 12 months from the date of manufacture. The warranty does not cover damage caused by:
1) improper use, storage or maintenance by the user;
2) repair or modification by an organization or person not authorized by the manufacturer;
3) force majeure;
4) transportation or other human causes.

9.2 Environmental protection
To protect the environment, when the product or its components are scrapped, dispose of them through an industrial-waste collection facility or return them to a recycling station for classification, dismantling, recycling and reuse in accordance with applicable national regulations.