# Usage Manual

ETEK ELECTRIC

## RCBO AFDD With Arc Fault Protection

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Thank you for choosing EK Series RCCB With Overcurrent Protection and Arc Fault Protection. Please read this manual before Installation, Operation and Maintenance.

### OVERVIEW

Residual current circuit breaker with overcurrent arc fault protection is mainly used to monitor earth leakage, circuit overload, short circuits and Arc fault detection which may occur due to causes of arcs in worn contacts in electrical equipment, damage to insulation, a break in a cable and loose connections.

### STANDARD AND QUALITY CERTIFICATES

**IEC/EN61009-1 IEC62026**

### Protection

① Arc Fault Protection
② Overload Protection
③ Short-Circuit Protection
④ Earth-Leakage Protection



### Technical Data

| | |
|---|---|
| Type | A |
| Rated current In | 6,10,16,20,25,32,40A |
| Poles | 1P+N(N pole can be connected and disconnected) |
| Rated voltage Ue | 230V~ |
| Insulation voltage Ui | 400V |
| Rated frequency | 50/60Hz |
| Rated residual operating current (I△n) | 10,30,100,300mA |
| Break time under I△n | ⩽0.1s |
| Rated short-circuit capacity Icn | 6,000A |
| Energy limiting class | 3 |
| Rated impulse withstand voltage (1.5/50) Uimp | 4,000V |
| Dielectric test voltage at ind.Freq. for 1min | 2kV |
| Pollution degree | 2 |
| Instantaneous tripping current | B,C |
| Electrical life | 2,000 Cycles |
| Mechanical life | 4,000 Cycles |
| Contact position indicator | Yes |



| | |
|---|---|
| Protection degree | IP20 |
| Reference temperature for setting of thermal element | 30°C |
| Ambient temperature (with daily average⩽35°C) | -5°C~+40°C |
| Storage temperature | -25°C~+70°C |
| Terminal connection type | Cable/Pin-type busbar |
| Terminal size top/bottom for cable | 25mm² 18-3AWG |
| Terminal size top/bottom for busbar | 25mm² 18-3AWG |
| Tightening torque | 2.5Nm 22In-lbs |
| Mounting | On DIN rail EN60715(35mm) by means of fast clip device |
| Connection | Power supply from button |

### Characteristics

| Type | Tripping current I△/A | | |
|---|---|---|---|
| AC | 0.5I△n<I△<I△n | | |
| A | Lagging Angle | I△n>0.01A | I△n⩽0.01A |
| | 0° | 0.35I△n⩽I△⩽1.4I△n | 0.35I△n⩽I△⩽2I△n |
| | 90° | 0.25I△n⩽I△⩽1.4I△n | 0.25I△n⩽I△⩽2I△n |
| | 135° | 0.11I△n⩽I△⩽1.4I△n | 0.11I△n⩽I△⩽2I△n |



### CHARACTERISTICS CURVES

IEC/EN61009-1 30~35℃

| | Thermal Tripping | | | Magnetic Tripping | | |
|---|---|---|---|---|---|---|
| | No tripping current | Tripping current | Time Limits t | Hold current | Trip current | Time Limits t |
| B Curve | 1.13× In | | ⩾1h | 3× In | | ⩾0.1s |
| | | 1.45× In | <1h | | 5× In | <0.1s |
| C Curve | 1.13× In | | ⩾1h | 5× In | | ⩾0.1s |
| | | 1.45× In | <1h | | 10× In | <0.1s |

Limit of action judgment for small arc current below 63A

| Test arc current (effective value) | 3A | 6A | 13A | 20A | 40A | 63A |
|---|---|---|---|---|---|---|
| Max breaking time | 1S | 0.5S | 0.25S | 0.15S | 0.12S | 0.12S |
| The test arc current is the expected current before ignition occurs in the test circuit | | | | | | |



### Led indicator instruction

What to do if AFDD/RCBO trips.
1, Disconnect all electrical appliances connected to the circuit;
2, Reset and trigger AFDD/RCBO to “ON” position;
3, For the description of LED indicators due to devices faulty--please refer to the Table 1 below;
3.1, If the fault indicator is normal, the tripping fault is a short-circuit or an overload;
4, Switch AFDD/RCBO to “ON” position and then connect 1 appliance one at a time on the circuit to see which device is causing the tripping of the AFDD;
5, Once faulty appliance has been identified, Do not use it, until it has been repaired or disconnected from the circuit;
6, After the faulty appliance has been repaired or disconnected, switch AFDD/RCBO to “ON” position;
7, If the fault is still not confirmed, please contact a qualified electrician for inspection.

Table 1

| SN | LED Indicator Instruction | | |
|---|---|---|---|
| 1 | LED-green light goes on. | Device normal operation | ● |
| 2 | LED-red light goes on 1 time and goes out 1 time, 5 cycles. | Arc fault | ●○●○●○●○●○ |
| 3 | LED-yellow light is on for 2 seconds around and off for 1 second around, 3 cycles. | Residual current fault | ● ○ ● ○ ● ○ |
| 4 | LED-red light goes on. | Arc self-check failure | ● |



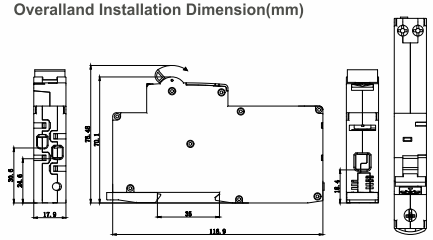
The LED light flashing program in Table 1 is described in detail:
1, When the product is in normal operation, the light on the AFDD will remain green;
2, Should the AFDD trip off and to check for an arc fault trip, put the AFDD into the “ON” position and the red light will flash continuously for 5 cycles. Then the arc module will detect itself and turn green when no fault is detected. If there is a fault, the red light will be lit;
3, Should the AFDD trip and to check for a Residual current fault, put the AFDD into the “ON” position and the yellow light will keep on for about 2 seconds, and then remain off for about 1 second, for a total of 3 cycles. Then the arc module detects itself and lights green when no fault is detected. If there is a fault, the red light will be on;
4, Arc self-test failure, red light on.
(Please contact a qualified electrician as the device may need to be changed.)

**⚠ WARNING**

- Ensure the power is disconnected before attempting to assemble and connect the device.
- Installation of these devices should only be carried out by a qualified Electrician.



### Overalland Installation Dimension(mm)



### Circuit Diagram