

Miniature Circuit Breaker (MCB)

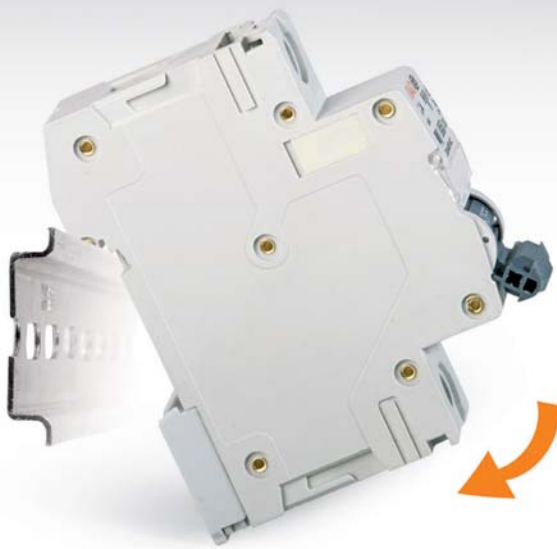


RAAD Miniature Circuit Breaker (MCB) is an electrical switch which provides automatic protection for an electrical circuit against damage caused by overload and short circuit. The main function of MCBs is to detect a fault condition and interrupt current flow. RAAD Miniature Circuit Breakers can be reset both manually or automatically to resume normal operation.

RAAD Miniature Circuit Breakers are labeled by a letter “B”, “C” or “D”, which indicates the instantaneous tripping current, that is the minimum value of current causing the circuit breaker to trip without intentional time delay.

RAAD Miniature Circuit Breakers are designed in accordance with IEC/EN 60898-1 in which reliability and safety is considerably regarded. Furthermore, easy installation on Din rail EN 60715 (35mm) makes you confidence to save your time. The 6kA and 10kA short-circuit breaking capacity makes them suitable for commercial and industrial application.





35mm DIN-rail mountable structure



Why You Should Use RAAD MCB's

RAAD Miniature Circuit Breakers provide the customer with the following advantages:

- Comprehensive protection against electric shock
- High protection against contact with live parts
- Dual function terminals enable simultaneous connection of busbar and cable without additional connection pieces
- Additional accessories can be easily fitted by the user
- Breaking capacity of up to 10kA (IEC 60898-1) made vast range of installation opportunities
- Arbitrary padlock for locking in the position of 'ON' or 'OFF'
- Finger protected combination head screw to increase safety (IP20)
- Quality guaranteed by international approval(KEMA)
- Neat, attractive finish greater ease of use
- Contact position indication shown on toggle (ON/OFF)
- PA6.6 is used in insulation body to increase fire resistance
- Well-designed labeling accompanied by marking window
- Copper current-carrying part and connection provides the best conductivity as well as longevity



Untouchable terminal IP20



Padlock in ON/OFF position



Wiring

Compatibility with Phillips and flat screwdrivers assure you to use RAAD MCBs safely and easily.

How MCB Works

RAAD Miniature Circuit Breakers work based on two different duties. One due to thermal effect of overload and the other due to electromagnetic effect of short-circuit current, so bimetal and electromagnetic units provide high level of protection against overload currents and short-circuit currents respectively.

Taking the above mentioned point into consideration, if a circuit is overloaded during a long period of time, the bimetal strip becomes heated which in a series of electromechanical chain of action, causes the MCB to break the current. On the other hand, if a circuit is faced with a short-circuit fault, MMF (Magneto Motive Force) of the coil causes its plunger to hit the latch point and displaces the latch, hence the MCB will break the current again.

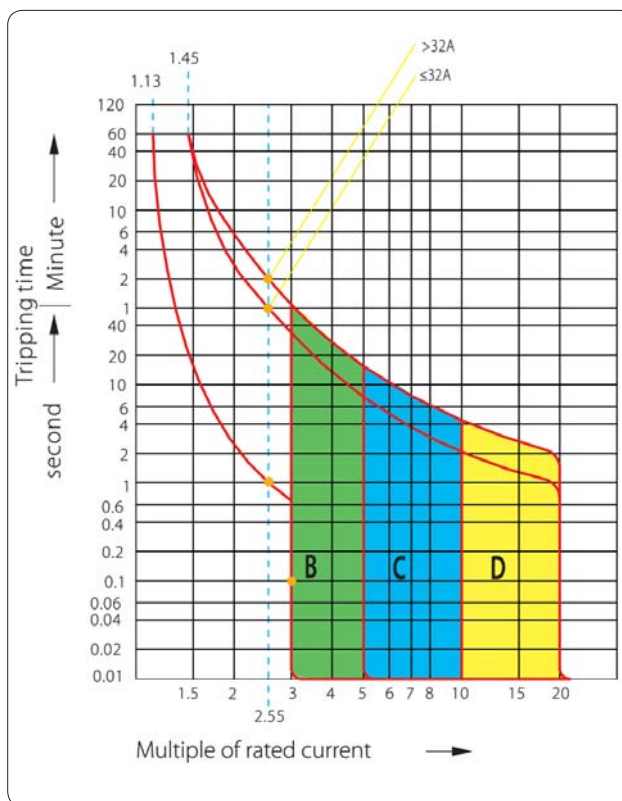
Instantaneous Tripping

Standard ranges of instantaneous tripping in accordance with IEC 60898-1 are given below:

| Type | Range |
|------|---|
| B | Above $3 I_n$ up to and including $5 I_n$ |
| C | Above $5 I_n$ up to and including $10 I_n$ |
| D | Above $10 I_n$ up to and including $20 I_n^*$ |

• For special cases values up to 50 may also be used.

| Type | Test Current | Limits of Tripping or non-tripping time | Result to be Obtained |
|-------------|---------------------------------|--|-----------------------|
| B, C, D | $1.13 I_n$ | $t \leq 1h$ (for $I_n \leq 63A$) | No Tripping |
| B, C, D | $1.45 I_n$ | $t \leq 1h$ (for $I_n \leq 63A$) | Tripping |
| B, C, D | $2.55 I_n$ | $1s < t < 60s$ (for $I_n \leq 32A$) $1s < t < 120s$ (for $I_n > 32A$) | Tripping |
| B C D | $3 I_n$ $5 I_n$ $10 I_n$ | $t \leq 0.1s$ | No Tripping |
| B C D | $5 I_n$ $10 I_n$ $20 I_n$ | $t < 0.1s$ | Tripping |



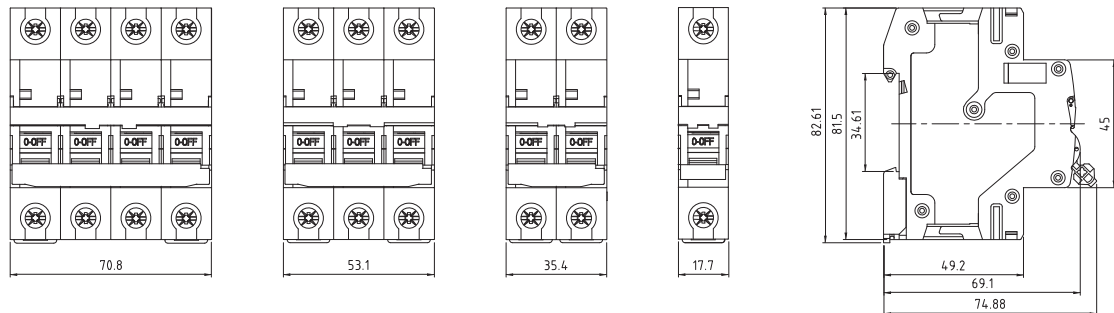
Electrical Data

| | |
|---|-------------------------------------|
| Rated current (A) | $1 \leq I_n \leq 63$ |
| Poles | 1P, 2P, 3P |
| Rated voltage (V~) | 230/400 |
| Rated frequency (Hz) | 50/60 |
| Insulation voltage (V) | 500 |
| Rated impulse withstand voltage(1.2/50) Uimp(V) | 6000 |
| Dielectric test voltage (1 min) (KV) | 2 |
| Thermo-magnetic release characteristic | B C D |
| Electrical life | 6000 |
| Circuit breaking capacity (I_{cn}) (kA) | 6,10 |
| Contact position indicator | Yes |
| Degree of protection | IP20 |
| Terminal connection type | Cable/U-type busbar/Pin-type busbar |
| Terminal size top/bottom for cable (mm²) | 25 |
| Terminal size top/bottom for busbar (mm²) | 25 |

Mechanical Data

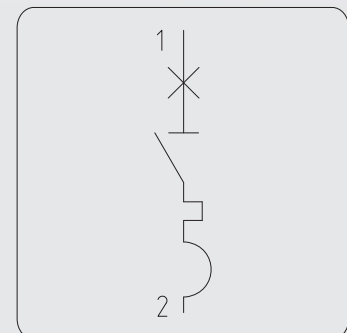
| | |
|---|-------------------------------|
| Pollution degree | 2 |
| Mechanical life | 10000 |
| Ambient temperature (with daily average $\leq 30^{\circ}\text{C}$) | $-5 \sim +40^{\circ}\text{C}$ |
| Storage temperature | $-25 + 70^{\circ}\text{C}$ |
| Tightening torque | 2.5 N*m |
| Mounting | On Din rail EN 60715 (35mm) |
| Connection | From top and bottom |

• Dimension



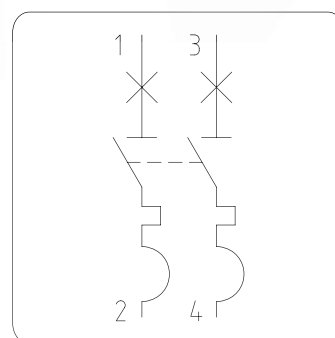
MA1 (1-Pole)

| I_n (A) | $I_{cn} = 6k$ | | | $I_{cn} = 10k$ | | |
|--------------|---------------|------------|-----|----------------|------------|-----|
| | Curve B | Curve C | Qty | Curve B | Curve C | Qty |
| 1 | 6120114001 | 6120314001 | 12 | 6120115001 | 6120315001 | 12 |
| 2 | 6120114002 | 6120314002 | 12 | 6120115002 | 6120315002 | 12 |
| 3 | 6120114003 | 6120314003 | 12 | 6120115003 | 6120315003 | 12 |
| 4 | 6120114004 | 6120314004 | 12 | 6120115004 | 6120315004 | 12 |
| 6 | 6120114006 | 6120314006 | 12 | 6120115006 | 6120315006 | 12 |
| 10 | 6120114010 | 6120314010 | 12 | 6120115010 | 6120315010 | 12 |
| 13 | 6120114013 | 6120314013 | 12 | 6120115013 | 6120315013 | 12 |
| 16 | 6120114016 | 6120314016 | 12 | 6120115016 | 6120315016 | 12 |
| 20 | 6120114020 | 6120314020 | 12 | 6120115020 | 6120315020 | 12 |
| 25 | 6120114025 | 6120314025 | 12 | 6120115025 | 6120315025 | 12 |
| 32 | 6120114032 | 6120314032 | 12 | 6120115032 | 6120315032 | 12 |
| 40 | 6120114040 | 6120314040 | 12 | 6120115040 | 6120315040 | 12 |
| 50 | 6120114050 | 6120314050 | 12 | 6120115050 | 6120315050 | 12 |
| 63 | 6120114063 | 6120314063 | 12 | 6120115063 | 6120315063 | 12 |



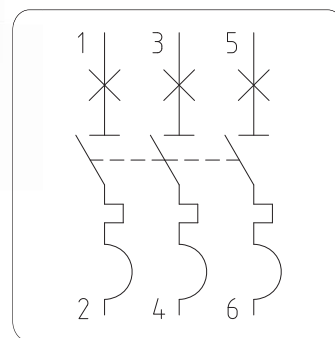
MA2 (2-Pole)

| I_n (A) | $I_{cn} = 6k$ | | | $I_{cn} = 10k$ | | |
|--------------|---------------|------------|-----|----------------|------------|-----|
| | Curve B | Curve C | Qty | Curve B | Curve C | Qty |
| 1 | 6120124001 | 6120324001 | 6 | 6120125001 | 6120325001 | 6 |
| 2 | 6120124002 | 6120324002 | 6 | 6120125002 | 6120325002 | 6 |
| 3 | 6120124003 | 6120324003 | 6 | 6120125003 | 6120325003 | 6 |
| 4 | 6120124004 | 6120324004 | 6 | 6120125004 | 6120325004 | 6 |
| 6 | 6120124006 | 6120324006 | 6 | 6120125006 | 6120325006 | 6 |
| 10 | 6120124010 | 6120324010 | 6 | 6120125010 | 6120325010 | 6 |
| 13 | 6120124013 | 6120324013 | 6 | 6120125013 | 6120325013 | 6 |
| 16 | 6120124016 | 6120324016 | 6 | 6120125016 | 6120325016 | 6 |
| 20 | 6120124020 | 6120324020 | 6 | 6120125020 | 6120325020 | 6 |
| 25 | 6120124025 | 6120324025 | 6 | 6120125025 | 6120325025 | 6 |
| 32 | 6120124032 | 6120324032 | 6 | 6120125032 | 6120325032 | 6 |
| 40 | 6120124040 | 6120324040 | 6 | 6120125040 | 6120325040 | 6 |
| 50 | 6120124050 | 6120324050 | 6 | 6120125050 | 6120325050 | 6 |
| 63 | 6120124063 | 6120324063 | 6 | 6120125063 | 6120325063 | 6 |



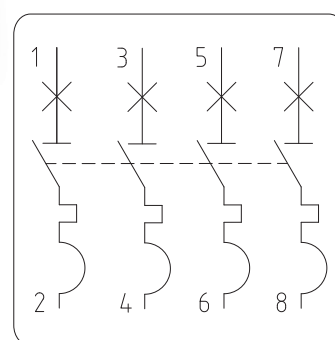
MA3 (3-Pole)

| I_n (A) | $I_{cn} = 6k$ | | | $I_{cn} = 10k$ | | |
|--------------|---------------|------------|-----|----------------|------------|-----|
| | Curve B | Curve C | Qty | Curve B | Curve C | Qty |
| 1 | 6120134001 | 6120334001 | 4 | 6120135001 | 6120335001 | 4 |
| 2 | 6120134002 | 6120334002 | 4 | 6120135002 | 6120335002 | 4 |
| 3 | 6120134003 | 6120334003 | 4 | 6120135003 | 6120335003 | 4 |
| 4 | 6120134004 | 6120334004 | 4 | 6120135004 | 6120335004 | 4 |
| 6 | 6120134006 | 6120334006 | 4 | 6120135006 | 6120335006 | 4 |
| 10 | 6120134010 | 6120334010 | 4 | 6120135010 | 6120335010 | 4 |
| 13 | 6120134013 | 6120334013 | 4 | 6120135013 | 6120335013 | 4 |
| 16 | 6120134016 | 6120334016 | 4 | 6120135016 | 6120335016 | 4 |
| 20 | 6120134020 | 6120334020 | 4 | 6120135020 | 6120335020 | 4 |
| 25 | 6120134025 | 6120334025 | 4 | 6120135025 | 6120335025 | 4 |
| 32 | 6120134032 | 6120334032 | 4 | 6120135032 | 6120335032 | 4 |
| 40 | 6120134040 | 6120334040 | 4 | 6120135040 | 6120335040 | 4 |
| 50 | 6120134050 | 6120334050 | 4 | 6120135050 | 6120335050 | 4 |
| 63 | 6120134063 | 6120334063 | 4 | 6120135063 | 6120335063 | 4 |



MA4 (4-Pole)

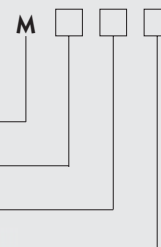
| I_n (A) | $I_{cn} = 6k$ | | $I_{cn} = 10k$ | |
|--------------|---------------|-----|----------------|-----|
| | Curve C | Qty | Curve C | Qty |
| 1 | 6120344001 | 3 | 6120345001 | 3 |
| 2 | 6120344002 | 3 | 6120345002 | 3 |
| 3 | 6120344003 | 3 | 6120345003 | 3 |
| 4 | 6120344004 | 3 | 6120345004 | 3 |
| 6 | 6120344006 | 3 | 6120345006 | 3 |
| 10 | 6120344010 | 3 | 6120345010 | 3 |
| 13 | 6120344013 | 3 | 6120345013 | 3 |
| 16 | 6120344016 | 3 | 6120345016 | 3 |
| 20 | 6120344020 | 3 | 6120345020 | 3 |
| 25 | 6120344025 | 3 | 6120345025 | 3 |
| 32 | 6120344032 | 3 | 6120345032 | 3 |
| 40 | 6120344040 | 3 | 6120345040 | 3 |
| 50 | 6120344050 | 3 | 6120345050 | 3 |
| 63 | 6120344063 | 3 | 6120345063 | 3 |



Ordering Information

- Example of coding structure:
MA3: is an AC 3-pole Miniature Circuit Breaker (without neutral)

Miniature circuit breaker
AC or DC type
Number of poles
Neutral (if exist)

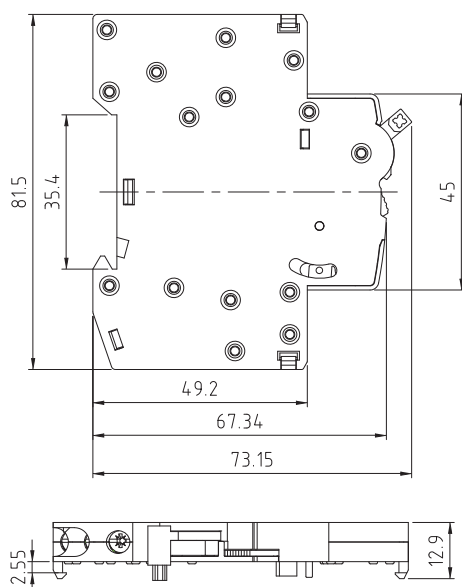


Auxiliary Attachments

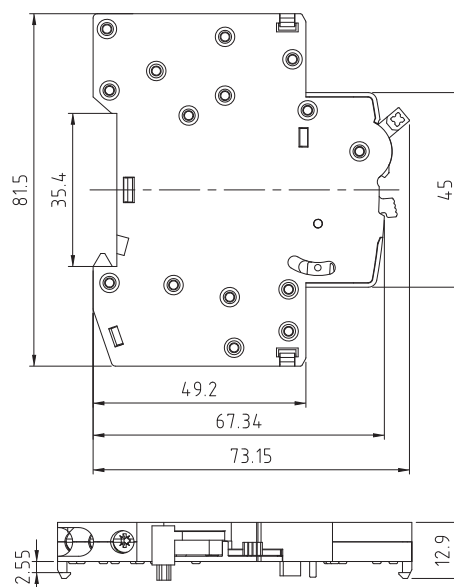
RAAD auxiliary contacts are units to be added on the side of circuit breakers to protect devices. They are applied to remotely indicate the position of the main circuit breaker contacts, whether is open or closed (OF), and also indicate fault in the circuit with alarm switch (SD).



MOF Dimension

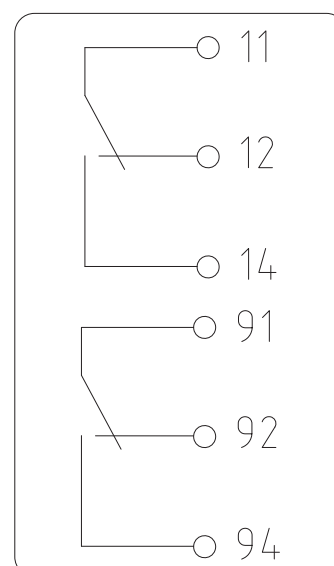


MSD Dimension



Wiring Diagram of Auxiliary Contacts

| Type | Voltage (V) | Rated current(A) | Contacts | Ordering number | Qty |
|------|-------------|------------------|----------|-----------------|-----|
| MOF | AC/415V | 3 | NO NC | 6124001001 | 10 |
| | AC/240V | 6 | | | |
| | DC/130V | 1 | | | |
| | DC/60V | 1.5 | | | |
| | DC/48 | 2 | | | |
| | DC/24 | 6 | | | |
| MSD | AC/415V | 3 | NO NC | 6124101001 | 10 |
| | AC/240V | 6 | | | |
| | DC/130V | 1 | | | |
| | DC/60V | 1.5 | | | |
| | DC/48 | 2 | | | |
| | DC/24 | 6 | | | |



Switch-Disconnecter (ISOLATOR)



RAAD switch-disconnectors are applied to all buildings and all industrial command and control circuits. They can be used as the master switch of terminal apparatus.

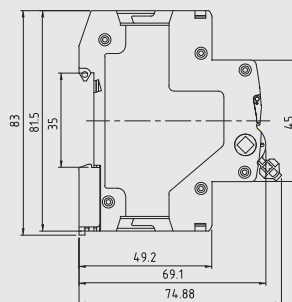
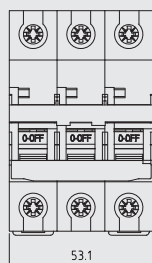
RAAD switch-disconnectors are in compliance with IEC 60947-3, the standard of Low-Voltage Switchgear and Controlgear. It can be used to disconnect and control all kinds of appliances, as well as provide advantages listed below:

- Rating current: 40 to 125 A
- Indication of state
- Finger protected combination head screw to increase safety (IP20)
- padlocking device
- well-designed labeling
- Switching of mixed resistive and inductive loads, including moderate overloads (utilization category AC-22A)

Electrical Data

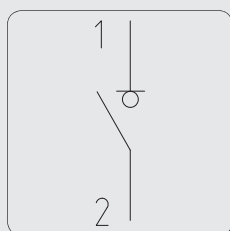
| | |
|--|--|
| Rated voltage (V) | 230/400 |
| Rated current (A) | 40, 63, 100, 125 |
| Rated frequency (Hz) | 50/60 |
| Rated making and breaking capacity | 1.05U _e , 3I _e , cosφ=0.65 |
| Rated impulse withstand voltage(kV) | 6 |
| Number of poles | 1P, 3P |
| Rated short circuit making and breaking capacity | 20I _e , 0.1S |
| Rated short time withstand current | 40and63A:1260A,1S 100and125A:1500A,1S |
| Mechanical life (times) | 20000 |
| Electrical life (times) | 6000 |
| Utilization category | AC-22A |
| Degree of Protection | IP20 |

Dimension



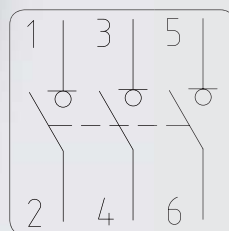
1A1

| Rated current(A) | Ordering number | Qty. |
|------------------|-----------------|------|
| 40 | 6125001040 | 12 |
| 63 | 6125001063 | 12 |
| 100 | 6125001100 | 12 |
| 125 | 6125001125 | 12 |



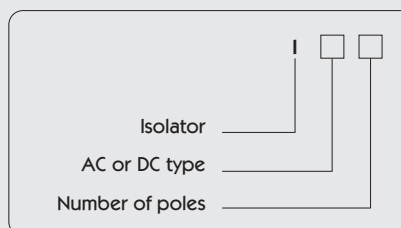
1A3

| Rated current(A) | Ordering number | Qty. |
|------------------|-----------------|------|
| 40 | 6125003040 | 4 |
| 63 | 6125003063 | 4 |
| 100 | 6125003100 | 4 |
| 125 | 6125003125 | 4 |



Ordering Information

- Example of coding structure:
1A3: is an AC 3-pole Switch-Disconnecter



Residual Current Circuit Breaker (RCCB)



Faulty insulated equipment or wrong usage of electrical devices cause current to flow through insulation to the earth. This is leakage current. This current poses two severe risk factors which are Fire Risk and Electrocution Risk.

RAAD Residual Current Circuit Breaker provides protection against the risk of electrocution and contact of livestock to prevent injury caused by fatal shocks and furthermore, property protection against conflagration by disconnecting the circuit quickly enough whenever

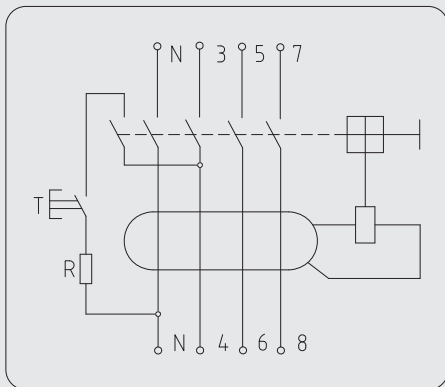
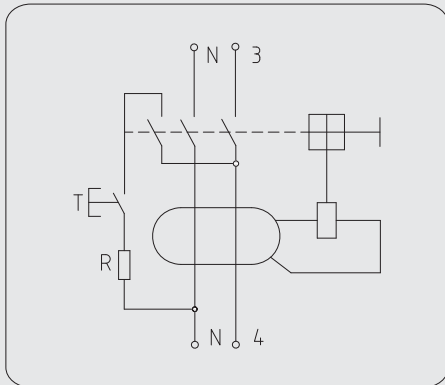
it detects that the electric current is not balanced between the energized conductor and the return neutral conductor. Needless to say that,

RAAD RCCBs provide the function of isolation switching and earth leakage protection of electrical circuits to meet all kinds of demands in this regard.

Compliance to IEC60715 makes all kinds of RAAD RCCBs capable of mounting on TH 35-15, TH-7.5 Din rails, which introduce easy installation as another time-saving preponderance of these products (2 and 4 poles).



Why You Should Use RAAD RCCB's



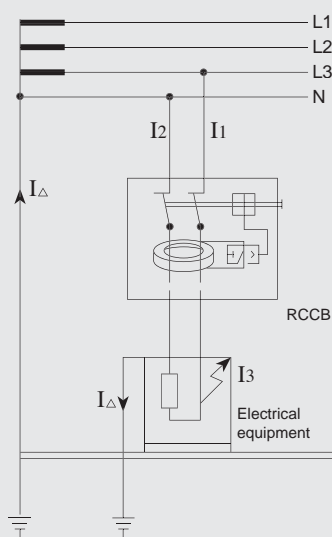
- High protection against earth fault/leakage current
- Automatic disconnection of the circuit when earth fault/leakage current occurs and exceeds the rated sensitivity.
- Rated short-circuit current withstand capacity up to 6kA
- Equipped with finger protective connection terminals (IP20)
- Fire resistant plastic parts to withstand abnormal heating and strong impact
- High current rating up to 63A
- Consisting PA6.6 insulating material to confine high grad fire
- Confirmed compliance to the international standard IEC 61008-1
- Meet all pertinent standards by outstanding performance
- Copper electric transmission path provides the best conductivity as well as longevity



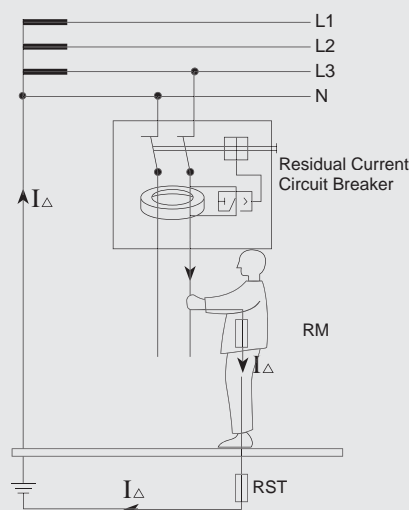
Protection Against Hazardous Shock

Indeed, this level of protection covers two parts as follow:

► Protection against indirect contact



► Protection against direct contact

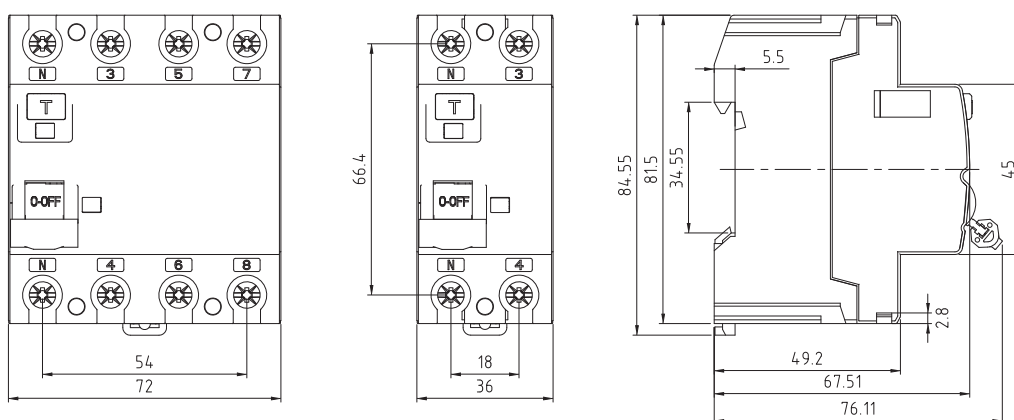


Electrical Data

| Standard | IEC/EN61008 |
|---|-------------------------------------|
| Rated current (A) | 25,32,40,63 |
| Rated voltage (V~) | 230/ 400 |
| Rated frequency (Hz) | 50/60 |
| Insulation voltage (V) | 500 |
| Rated residual operating current $I_{\Delta n}$ (A) | 0.03 0.3 |
| Rated residual making and breaking capacity $I_{\Delta m}$ (A) | 500($I_n=25/40$) 630($I_n=63$) |
| Rated conditional short-circuit current $I_{nc} = I_{\Delta c}$ (A) | 6000 |
| Break time in $I_{\Delta n}$ (s) | <0.3 |
| Rated impulse withstand voltage(1.2/50) U_{imp} (V) | 6000 |
| Dielectric test voltage (1min) (kV) | 2.5 |
| Electrical life and mechanical life | 4000 |
| Fault current indicator | Yes |
| Degree of protection | IP20 |
| Terminal connection type | Cable/U-type busbar/Pin-type busbar |

Mechanical Data

| | |
|-------------------------------------|----------------------------|
| Pollution degree | 2 |
| Ambient temperature | -5 +40°C |
| Storage temperature | -25 +70°C |
| Terminal size top/bottom for cable | 25 mm ² |
| Terminal size top/bottom for busbar | 25 mm ² |
| Tightening torque | 2.5 N*m |
| Mounting | On Din rail EN 60715(35mm) |
| Connection | From top |
| Mounting position | Any |



2-Pole

| Type | Rated current(A) | Rated residual operating current (mA) | Ordering number | Qty. |
|------|------------------|---------------------------------------|-----------------|------|
| RA2N | 25 | 30 | 6123003025 | 1 |
| RA2N | 32 | 30 | 6123003032 | 1 |
| RA2N | 40 | 30 | 6123003040 | 1 |
| RA2N | 63 | 30 | 6123003063 | 1 |

| Type | Rated current(A) | Rated residual operating current (mA) | Ordering number | Qty. |
|------|------------------|---------------------------------------|-----------------|------|
| RA2N | 25 | 300 | 6123007025 | 1 |
| RA2N | 32 | 300 | 6123007032 | 1 |
| RA2N | 40 | 300 | 6123007040 | 1 |
| RA2N | 63 | 300 | 6123007063 | 1 |



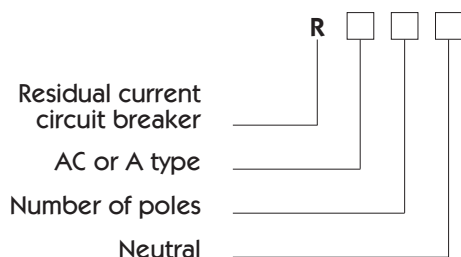
4-Pole

| Type | Rated current(A) | Rated residual operating current (mA) | Ordering number | Qty. |
|------|------------------|---------------------------------------|-----------------|------|
| RA4N | 25 | 30 | 6123004025 | 1 |
| RA4N | 32 | 30 | 6123004032 | 1 |
| RA4N | 40 | 30 | 6123004040 | 1 |
| RA4N | 63 | 30 | 6123004063 | 1 |

| Type | Rated current(A) | Rated residual operating current (mA) | Ordering number | Qty. |
|------|------------------|---------------------------------------|-----------------|------|
| RA4N | 25 | 300 | 6123008025 | 1 |
| RA4N | 32 | 300 | 6123008032 | 1 |
| RA4N | 40 | 300 | 6123008040 | 1 |
| RA4N | 63 | 300 | 6123008041 | 1 |



Ordering Information



Example of Structure

RA4N: is an AC 4-pole RCCB with neutral wire

www.raad-co.com

