

alfanar

alfanar RCBO

Plug-in and DIN-Rail





PARTNERSHIP

SAFETY

DURABILITY

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alfanar Hassas RCBO

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Introduction

RCBO is an abbreviation for “Residual Current Breaker with integral Overcurrent protection”. Basically, it is a technical combination of two products, namely the MCB and RCCB.

That means one product can provide all protection functions:

- Overcurrent protection for overloads and short circuits, same as MCB
- Fault protection with residual current behavior, the same as RCCB
- Additional protection in case of direct contact with live parts, the same as RCCB with 30mA rated residual current.

These electronic RCBOs can be installed in countries where the use of 1P+N RCBO with functional earth is consolidated.

Design

Safety

Reliability

Performance

Installation

Environment



Design Features



Aesthetics: alfanar Identity

A registered signature design style for all **alfanar** modular products that reflect **alfanar**'s originality and commitment to quality.

alfanar Patented Design

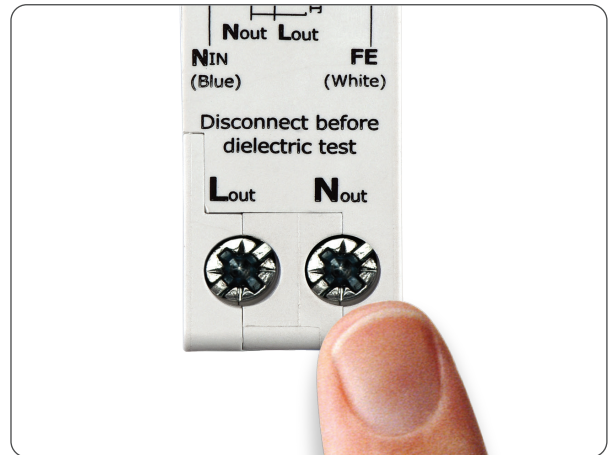
Our RCBO's are patent-protected. The whole RCBO is also protected as an industrial design.

Safety Features



Sealable Handle

Safe and effective method for locking out circuit breakers in ON and OFF positions. This enables user to securely lock the breaker, control the supply, prevent tampering and perform safe maintenance of end equipment.



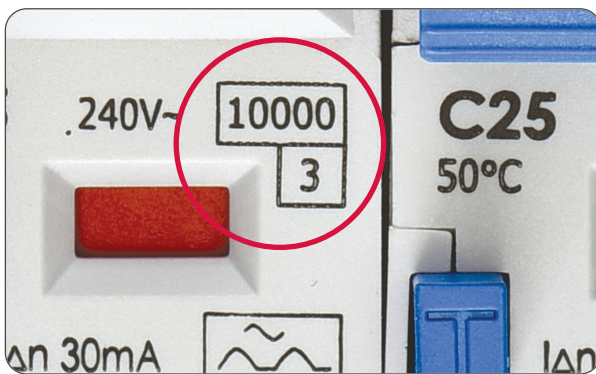
IP20 Protection

A rating of “IP20” denotes protection from solid objects approximately 12mm in size, such as adult fingers.



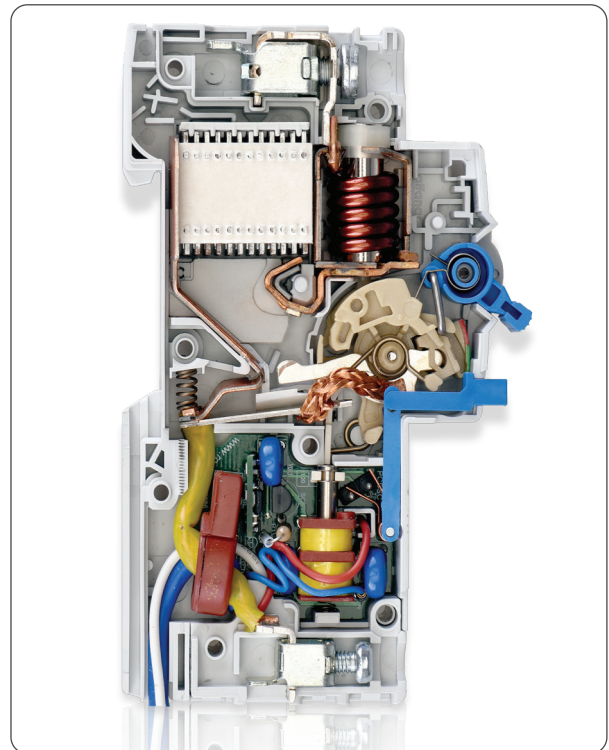
True Contact Indication

Red and green color flags provide a clear visual indication of the contact status inside, irrespective of handle position.



Energy Class 3

Energy Class 3 ensures the lowest possible flow of energy through the circuit in case of fault preventing damage to surrounding and downstream equipment and networks.



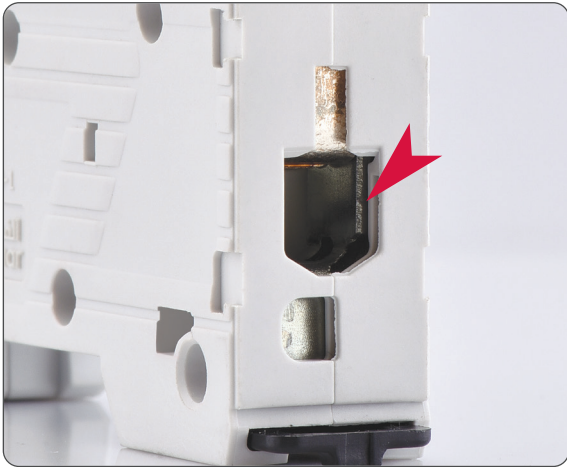
Contact Separation

In normal ON/OFF operation contacts separation is 8mm, in case of abnormal /fault conditions the contacts get separated by 10 mm, which prevents the arc from restriking and ensures effective arc quenching.

Benefits of using RCBO as an isolator

- Prevents arc re-striking
- Foolproof breaking of circuit
- Higher voltage withstand capability

Reliability Features



Ready for Connection

A box clamp is provided in an open condition so that the breaker is ready for Cable/Busbar connection which reduces installation time.

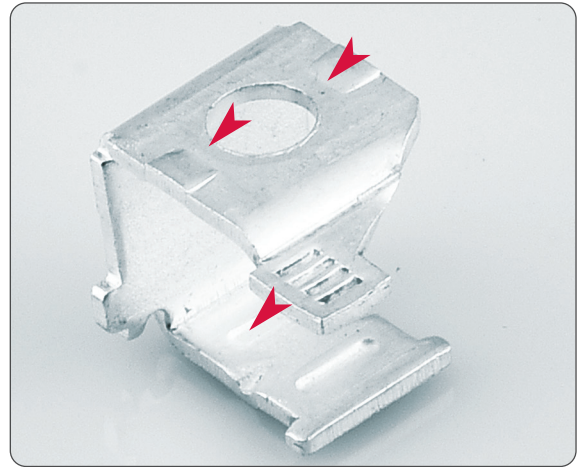
Conforms to Major International Standard



Tested as per IEC 61009-1



On the safe side.

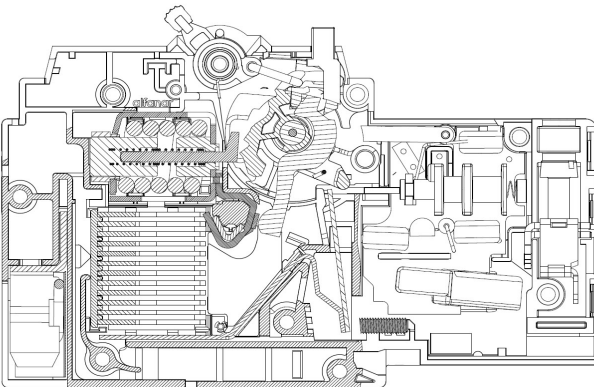


Reliable Termination

Biting teeth only on incoming terminals for both cable and busbar termination.

- World class terminal reliability
- Excellent electrical joint
- Excellent mechanical joint
- 2.8 N-m torque
- Firm cable grip
- Excellent cable pull Withstand
- Excellent temperature performance

Performance Features



Unique Patented Quick Tripping Arrangement

The mechanism is arranged to transform linear force into rotary force for quick opening of the contacts which reduces the energy inside the breaker to a minimal level during the clearance of fault. The effectiveness of this action remains the same up to the last shot of short circuit sequence.



Contact Tip

Silver graphite contact tips ensures longer life and maximum safety against contact welding due to superior anti-welding properties enhancing safety and life of system.

Installation Features



Ergonomics: Better Grip

With its wide surface area and prominent strips around the periphery, the ergonomically designed handle assists with the manual operation of the circuit breaker from single pole to four poles with optimum force, and ensures a secure grip while operating the handle.



Ease of Mounting

Two-position DIN clip, facilitates easy mounting and removal of DIN type RCBO from DIN rail channel for convenient installation.

RCBO is also available in Plug-in form which is very easy and quick to install.



Terminal Shutter

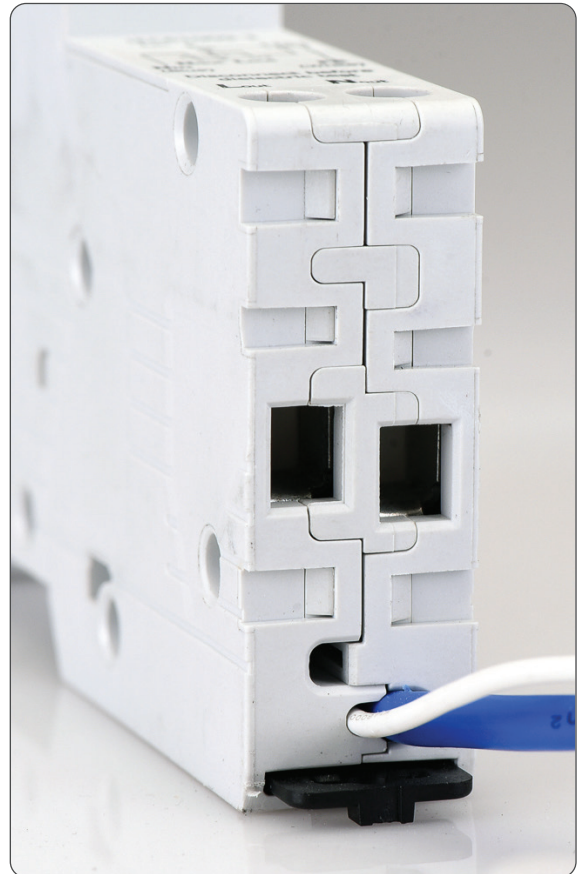
Insertion of cable in the wrong place below the wrong termination is not possible.

Flat locking shutters cover the gap behind the box to eliminate the possibility of the wrong entry of wire during installation.



Suitable for Multiple Tools

Space for insulated screwdrivers - the larger hole allows the use of an insulated screwdriver to tighten the screws of both wire terminals, ensuring maximum operational safety.

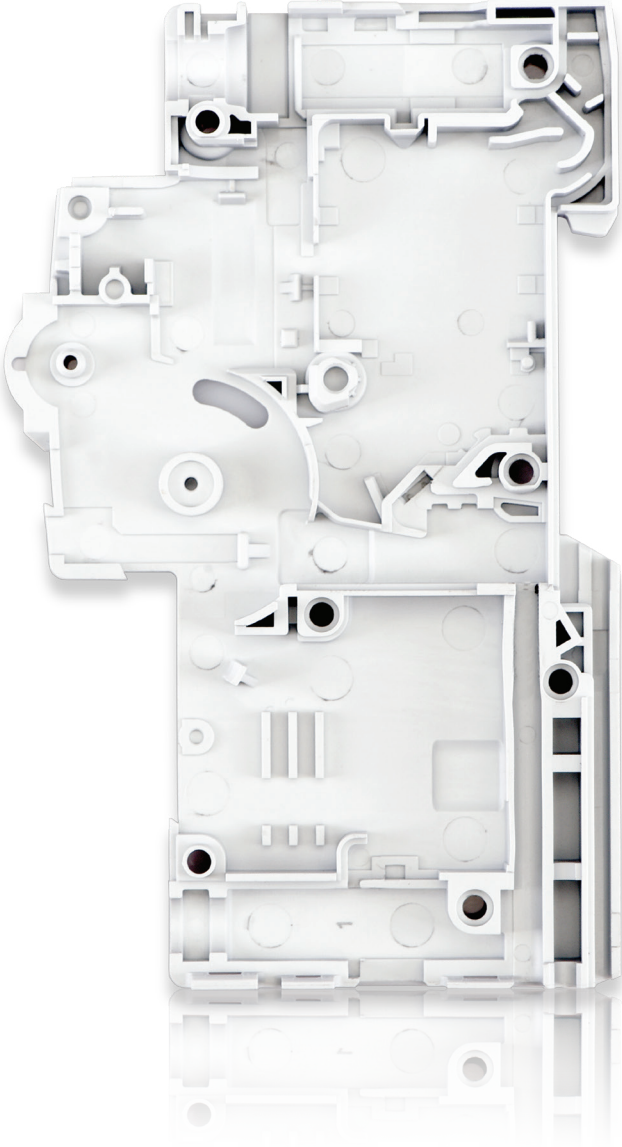


Snap Locking

- Snap locking at load side provides an additional locking feature and prevents the formation of a gap between the base and cover, and dislocation of terminals due to cable loads.
- Excellent mechanical joint
- Excellent cable pull withstand

Environment Features

alfanar uses environmentally friendly state-of-the-art housing material. With the latest generation of halogen free thermoplastics for RCBOs, it is now possible to recycle the RCBOs completely which reduces environmental pollution.



Performance and Technical Specifications

RCBO Technical Data		
	DIN rail	Plugin
Product standard	IEC 61009-1	
Tripping characteristics	C Curve	
Electrical		
Rated current range I_n (A)	10, 16, 20, 25, 32, 40	10, 16, 20, 25, 32, 40
Rated leakage current $I_{\Delta n}$ (mA)	30,100	30,100
Number of poles	1P+N	1P+N
Type	A	A
Rated frequency (Hz)	50/60	50/60
Rated voltage (U_n)	240V	240V
Rated insulation voltage (U_i) V AC	500	500
Rated impulse voltage (U_{imp}) kV	4	4
Protection degree	IP20	IP20
Rated short circuit capacity I_{cn} (kA)	10kA	10kA
Rated service short circuit breaking capacity I_{cs} (A)	7.5kA	7.5kA
Rated residual making and breaking capacity $I_{\Delta m}$ (kA)	6kA	6kA
Suitability for isolation	Yes	Yes
Thermal tripping characteristics	> 1 hour @ 1.13 I_n @ 50°C	> 1 hour @ 1.13 I_n @ 50°C
	< 1 hour @ 1.45 I_n @ 50°C	< 1 hour @ 1.45 I_n @ 50°C
Endurance	As per IEC 61009-1	As per IEC 61009-1
Mechanical		
Protection degree	IP 20	IP 20
Maximum terminal capacity (mm ²)	Line	35
	Load	16
Tightening torque (Nm)	Line	2.8
	Load	1.2-1.5 Nm
Method of connection	Cables / Busbar / Cables + Busbar	Cables
Environmental/General		
Energy limiting class	3	3
Reference ambient air temperature	50°C	50°C
Operating temperature range	- 5°C to + 70°C	- 5°C to + 70°C
Storage temperature range	- 5°C to + 70°C	- 5°C to + 70°C

General Characteristics

The electronic residual current circuit breakers with overcurrent protection (RCBO) meet the demand for devices that fully protect modern installations against short circuit currents, overloads, earth fault currents, and indirect contacts, providing additional protection against direct contacts.

Each RCBO is fitted with a functional earth wire to guarantee the highest level of safety, even in case of loss of neutral.

In only one module width, these electronic residual current circuit breakers with overcurrent protection offers a technologically advanced and comprehensive range with outstanding features, sizes and tripping characteristics.

The electronic RCBOs share the same profile as Hassas MCB, offering a smart retrofit solution for space constrained applications.

Residual Leakage Tripping

When the load is connected to the supply through the RCBO, the line and neutral conductors are connected through primary windings on a toroidal transformer. In this arrangement the secondary winding is used as a sensing coil and is electrically connected to a sensitive relay or solid state switching device, the operation of which triggers the tripping mechanism.

When the line and neutral currents are balanced, as in a healthy circuit, they produce equal and opposite magnetic fluxes in the transformer core with the result that there is no current generated in the sensing coil. When the line and neutral currents are not balanced they create an out-of-balance flux. This will induce a current in the secondary winding which is used to operate the tripping mechanism. It is important to note that both the line and neutral conductors pass through the toroid.

Thermal Release

To protect against fault arising due to overloading or increase in temperature, a bimetallic strip is used. The thermal action of the RCBO is achieved with a bimetallic strip whenever continuous overcurrent flows through RCBO, the bimetallic strip is heated and bends the trip. This deflection of the bimetallic strip releases a latch. As this mechanical latch is attached to the operating mechanism, it causes the miniature circuit breaker contacts to open.

The thermal release consists of a bimetallic strip which becomes deformed when heated beyond the normal operating values, releasing the latch that holds the contacts. The reaction time of a bimetallic strip is inversely proportional to the intensity of the current. As a result of its thermal inertia, the bimetallic strip reacts faster when a second overload follows the first in quick succession.

General Characteristics

Magnetic Release

The RCBO functions by interrupting the continuity of electrical flow through the circuit once a fault occurs and hence overcurrent is detected. Simply stated, the RCBO is a switch which automatically turns off when the current flowing through it passes the maximum allowable limit.

There are two contacts in the RCBO

- Fixed contact
- Moving contact

When the current exceeds its pre-determined value, the solenoid forces the moveable contact to open and the RCBO turns off, discontinuing the current flow to the circuit. To resume the flow of the current, the RCBO needs to be turned on manually. This protects the circuit from faulty current flowing due to overload and overcurrent.

During a short circuit condition, there is a sudden rise of current; which causes the electromechanical movement of the plunger that is connected with a tripping coil or solenoid of RCBO. The plunger strikes the trip lever causing instant release of the latch mechanism subsequently opening the circuit breaker contacts.

An energy limiting class number denotes the maximum I^2t let-through energy by a circuit breaker under short circuit or earth fault conditions. This information may be used by the electrical installation designer for the same purposes as the information obtained from the I^2t characteristic.

Class 3 is the highest current limiting classification and may be used to offer protection to cables having a smaller cross-sectional area.

Rated Operational Voltage (U_e)

This is the voltage(s) at which the circuit breaker can be used. The value indicated is usually the maximum value. At lower voltages, certain characteristics may differ, or even be improved, such as the breaking capacity.

Rated Insulation Voltage (U_i)

This value acts as a reference for the insulation performance of the device. The insulation test voltages are determined based on this value.

Rated Impulse Withstand Voltage (U_{imp})

This value characterizes the ability of the device to withstand transient overvoltage such as lightning (standard impulse 1.2/50 μ s).

Rated Current (I_n)

This is the maximum current value the circuit breaker can withstand on a permanent basis. This value is always given for an ambient temperature around the device of 30°C in accordance with Standard IEC 61009-1. alfanar products go beyond this standard by offering no derating up to 50°C. If this temperature is higher, a derating factors tables must be used to select the suitable breaker.

Rated Short Circuit Capacity (I_{cn})

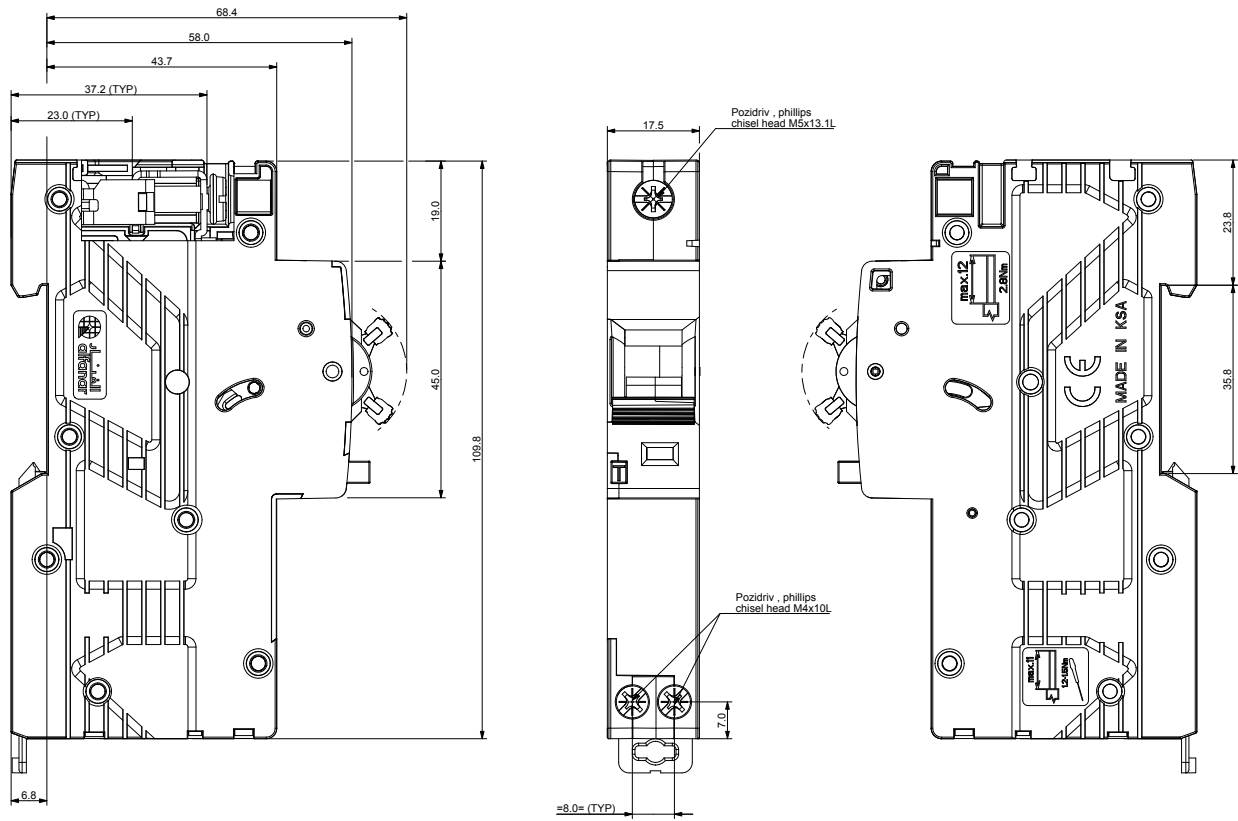
In Standard IEC 61009-1, the breaking capacity of the device is tested in a similar way but is called I_{cn} . After the test, the circuit breaker must retain its dielectric properties and be able to trip in accordance with the specifications in the standard.

Rated Service Short Circuit Capacity (I_{cs})

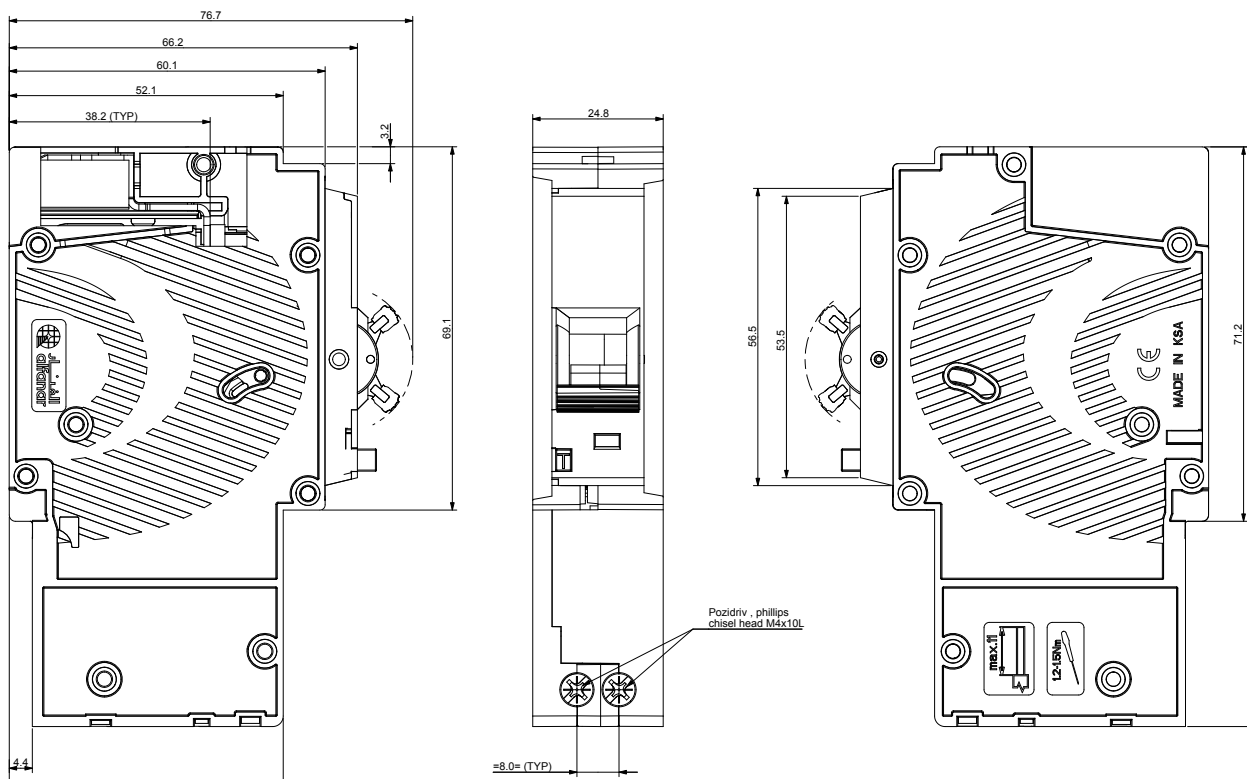
This is the value expressed as a percentage of I_{cn} . It will be one of the following values: 25% (category A only), 50%, 75% or 100%. The circuit breaker must be capable of operating normally after breaking the I_{cs} current several times using the sequence O-CO-CO.

Dimensions

Hassas RCBO Din-Rail type



Hassas RCBO Plug-In type



Ordering Data

Hassas RCBO DIN-Rail type

Ampere	Leakage current	Description	Item code
10A	30mA	RCBO DIN rail Type-A 10A 30mA 10KA C	HERD40N030M10C
16A	30mA	RCBO DIN rail Type-A 16A 30mA 10KA C	HERD40N030M16C
20A	30mA	RCBO DIN rail Type-A 20A 30mA 10KA C	HERD40N030M20C
25A	30mA	RCBO DIN rail Type-A 25A 30mA 10KA C	HERD40N030M25C
32A	30mA	RCBO DIN rail Type-A 32A 30mA 10KA C	HERD40N030M32C
40A	30mA	RCBO DIN rail Type-A 40A 30mA 10KA C	HERD40N030M40C
10A	100mA	RCBO DIN rail Type-A 10A 100mA 10KA C	HERD40N100M10C
16A	100mA	RCBO DIN rail Type-A 16A 100mA 10KA C	HERD40N100M16C
20A	100mA	RCBO DIN rail Type-A 20A 100mA 10KA C	HERD40N100M20C
25A	100mA	RCBO DIN rail Type-A 25A 100mA 10KA C	HERD40N100M25C
32A	100mA	RCBO DIN rail Type-A 32A 100mA 10KA C	HERD40N100M32C
40A	100mA	RCBO DIN rail Type-A 40A 100mA 10KA C	HERD40N100M40C

Ordering Data

Hassas RCBO Plug-In type

Ampere	Leakage current	Description	Item code
10A	30mA	RCBO Plugin Type-A 10A 30mA 10KA C	HERP40N030M10C
16A	30mA	RCBO Plugin Type-A 16A 30mA 10KA C	HERP40N030M16C
20A	30mA	RCBO Plugin Type-A 20A 30mA 10KA C	HERP40N030M20C
25A	30mA	RCBO Plugin Type-A 25A 30mA 10KA C	HERP40N030M25C
32A	30mA	RCBO Plugin Type-A 32A 30mA 10KA C	HERP40N030M32C
40A	30mA	RCBO Plugin Type-A 40A 30mA 10KA C	HERP40N030M40C
10A	100mA	RCBO Plugin Type-A 10A 100mA 10KA C	HERP40N100M10C
16A	100mA	RCBO Plugin Type-A 16A 100mA 10KA C	HERP40N100M16C
20A	100mA	RCBO Plugin Type-A 20A 100mA 10KA C	HERP40N100M20C
25A	100mA	RCBO Plugin Type-A 25A 100mA 10KA C	HERP40N100M25C
32A	100mA	RCBO Plugin Type-A 32A 100mA 10KA C	HERP40N100M32C
40A	100mA	RCBO Plugin Type-A 40A 100mA 10KA C	HERP40N100M40C

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Our customer satisfaction rate was 94.4%
on services delivered by our Technical Support team.

Customer Service
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to learn more about our
free maintenance service

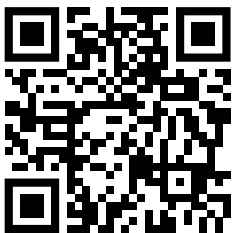


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