RCBO - RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERLOAD & SHORT CIRCUIT PROTECTION

Havells New RCBO is a single composite device which provides protection against over currents, short circuit and earth leakage faults. It comes in the same width and profile as that of a standard MCB. It is designed for use in domestic, commercial and industrial distribution systems at the most downstream circuit for ensuring high degree of protection to the user for a particular circuit. In normal use, it is safe to use and free of threat to user as well as to environment.

Features (Electromechanical RCBO)

- Proper cable termination with 25 mm^2 slot and safety shutter
- Dual termination on the outgoing terminal
- Field fittable auxiliary contact
- Inscription window with On and Off Indication

Features (Electronic RCBO)

- Pulsating DC protection - Type A
- Discrimination using time delay - Type S RCBO
- Controlled response VD RCBO (Electronic)
- Short-circuit breaking capacity 10 kA Protection in case of N-E faults Higher stacking density in distribution boards
- Enhanced immunity to nuisance tripping
- ISI and CE marking. RoHS Complaint, 'Green Product'

Execution

Electromechanical RCBO (SPN & 2P RCBOs)
Electromechanical RCBO (TPN & FP RCBOs)
Electronic RCBO - A Type (SPN - 2M)
Electronic RCBO - A Type (TPN - 4M)

Specification

IS 12640 : Part 2/IEC 61009-1/EN : 61009-1

Range

32 A, 40 A & 63 A

6 A to 40 A

Sensitivity

30 mA, 100 mA & 300 mA

Test Button
Test button for regular inspection/testing

Inscription Window
Inscription window with ON & OFF indication

Proper Cable Termination
Proper cable termination with 25 mm^2 slot and safety shutter

Construction

Havells new RCBO is a single composite device which provides protection against over currents, short-circuit and earth leakage faults, it comes in the same width and profile as that of a standard MCB. It is designed for use in domestic, commercial and industrial distribution systems at the most downstream circuit for ensuring high degree of protection to the user for a particular circuit. In normal use, it is safe to use and poses no threat to user as well as to environment.

Features

- Positive contact indication: Red for ON, Green for OFF
- Short circuit breaking capacity 10 kA.
- Large terminal capacity: RCBOs have 35 mm^2 for cool running while in operation.
- Protection in case of loss of supply neutral: Even in event of loss of supply neutral, Havells RCBO provides protection against earth faults. The Functional Earth (FE) white color wire connected to earth provides this protection.
- Controlled response & immunity to nuisance tripping: The trip level and the response time of the Havells VD (Voltage Dependent) RCBO using electronic circuit is set to very precise values and thereby provide greater immunity to nuisance tripping that can be caused by mains borne noise, surge voltages, lighting surges, reactive loads, mains filters, etc.
- Neutral to earth faults: A connection that occurs between N and E on the load side of any RCBO will impact on its performance and cause the trip level to increase. In the case of a N - E fault, the user may have no way of knowing that this fault exists and that the RCBO has been desensitized. Under this condition, the Havells VD RCBO provides a far greater level of protection than a normal VI (Voltage Independent) RCBO.

Aesthetics & Convenience

- The new module's unique compact construction enables far more devices to be fitted into a distribution board than previously possible, and 2 Module RCBO can simply replace existing MCB 2 pole when upgrading a board.
- High stacking density = smaller chassis & distribution boards.

Reliability & Continuity Of Service

- Enhanced discrimination with Havells MCBs
- Retrofits Havells MCBs in distribution boards with no modifications in general
- Robust construction.

Energy Limiting

Havells RCBO meets the requirements for energy let through by IEC & British Standard for energy limiting class 3.

Additional Range - Type A & S

Type A - Pulsating DC Protection: Any electrical appliance with power control has the ability to produce earth fault currents with pulsating DC (rectified AC) components. RCBOs that provide this type of protection are referred to as Type A RCBOs.

Standard VI RCBOs do not provide this protection, and are referred to as Type AC RCBOs. Havells VD RCBOs have been specifically designed to provide protection against pulsating DC fault currents.

- Type S- Selective or Time Delay: RCBOs are also divided into two categories determined by their response time to an earth fault current, as follows
- General Type - having a trip time <300 ms for fault currents of IΔn and <40 ms for fault currents >5 IΔn.

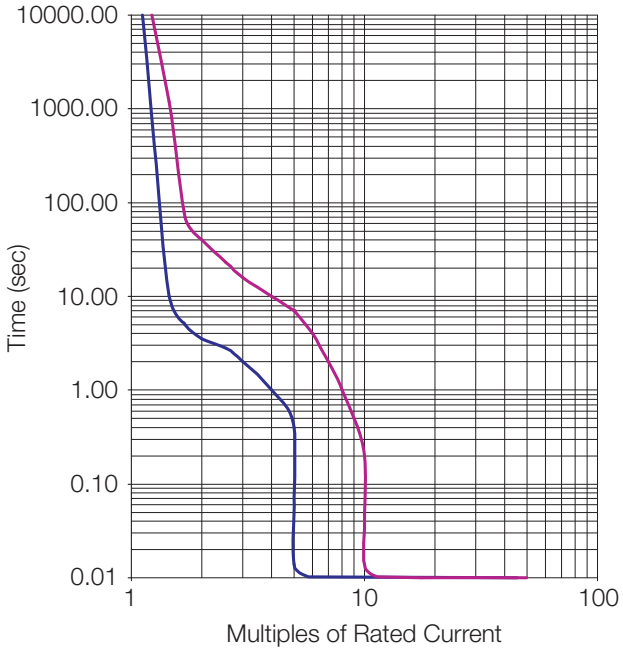
Technical Information	Electromechanical 2P RCBOs used as (SPN & 2P RCBOs)
Specification Reference	IS 12640 (Part 2) & IEC 61009-1
Rated Current (In)	32 A, 40 A & 63 A
Rated Residual Operating Current (IΔn)	30 mA, 100 mA, 300 mA
Instantaneous Tripping Current	'C' curve
Rated Voltage (Un)	240 V~
Rated Insulation Voltage (Ui)	660 V
Rated impulse withstand voltage	4 kV
Rated Frequency	50 Hz
No. of Pole	2 Pole
Rated Short Circuit Capacity (Icn)	10 kA
Rated Service Short Circuit Capacity (Ics)	7.5 kA
Rated Residual Making Breaking Capacity (IΔm)	630 A for 63 A (500 A-32 A to 40 A)
Operating Characteristics in case of Residual Currents	'A' & 'AC' Type
Nature of Supply	Pulsating DC
Method of Mounting	Panel Board Type (DIN Rail)
Degree of Protection	IP 20
Terminals for External Conductors	25 mm^2
Net Weight	0.424 kg
Ambient Working Temperature	-5°C to +55°C
Electrical & Mechanical Endurance	4000 (No. of Operations)
Trip Time	<40 ms
Shock Resistance	40 mm free fall
Vibration Resistance	3 G

- S Type - having a trip time of 150 - 500 ms for IΔn, and 40 - 130 ms for >5 IΔn.

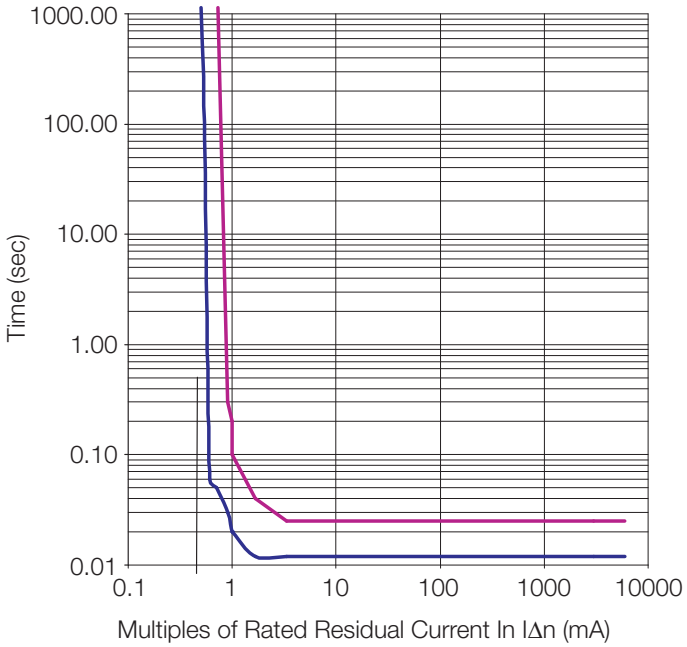
(IΔn is the rated residual operating current of the RCBO)

As the name implies, general types are intended for general purpose use. However, S (selective) types are normally used in conjunction with downstream general type RCBOs.

The S type effectively provides discrimination in terms of the response time to earth fault currents for upstream ad downstream RCBOs. For example, when two RCBOs are connected in series the first RCBO will often be an S type.



Time Current Characteristics C Curve



Residual Current Tripping Characteristics (General Type)

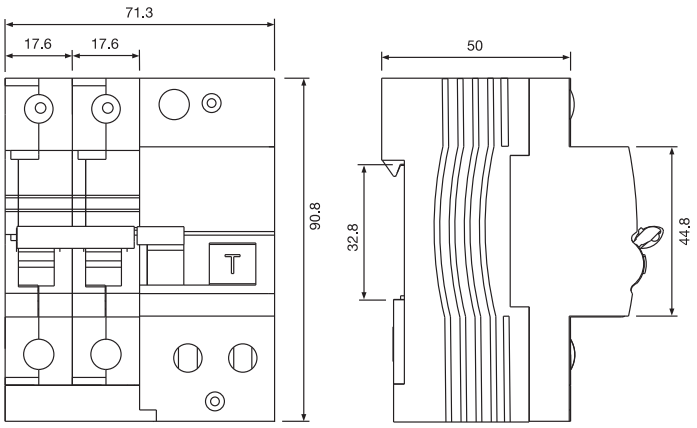
	Electromechanical 4P RCBOs used as (TPN & FP RCBOs)	Electronic RCBO - A Type (SPN - 2M)	Electronic RCBO - A Type (TPN - 4M)
	IS 12640 (Part 2) & IEC 61009-1	IS 12640 (Part 2) & IEC 61009-1	IS 12640 (Part 2) & IEC 61009-1
	32 A, 40 A & 63 A	6 A, 10 A, 16 A, 20 A, 25 A, 32 A, 40 A	6 A, 10 A, 16 A, 20 A, 25 A, 32 A, 40 A
	30 mA, 100 mA, 300 mA	30 mA, 100 mA, 300 mA	30 mA, 100 mA, 300 mA
	'C' curve	'C 'curve	'C 'curve
	415 V~	240 V~	415 V~
	660 V	660 V	660 V
	4 kV		
	50 Hz	50 Hz	50 Hz
	4 Pole	1P+N	3P+N
	10 kA	10 kA	10 kA
	7.5 kA		
	630 A for 63 A (500 A–32 A to 40 A)	500 A	500 A
	'A' & 'AC' Type	'A' Type	'A' Type
	Pulsating DC		
	Panel Board Type (DIN Rail)	Panel Board Type (DIN Rail)	Panel Board Type (DIN Rail)
	IP 20	IP 20	IP 20
	25 mm^2	35 mm^2	35 mm^2
	0.740 kg	0.420 kg	0.84 kg
	-5°C to +55°C	-5°C to +55°C	-5°C to +55°C
	4000 (No. of Operations)	4000 (No. of Operations)	4000 (No. of Operations)
	<40 ms	<40 ms	<40 ms
	40 mm free fall	40 mm free fall	40 mm free fall
	3 g	3 g	3 g

RCBO - SPN & 2P

Electromechanical 2P RCBOs used as (SPN & 2P RCBOs)
(In accordance with IS 12640-2 & IEC 61009-1) 240 V, 50 Hz, with 10 kA short circuit capacity

Rating	30 mA Cat. No.	100 mA Cat. No.	300 mA Cat. No.
32 A	DHBMACDP4030032	DHBMACDP4100032	DHBMACDP4300032
40 A	DHBMACDP4030040	DHBMACDP4100040	DHBMACDP4300040
63 A	DHBMACDP4030063	DHBMACDP4100063	DHBMACDP4300063

Dimensions (in mm)

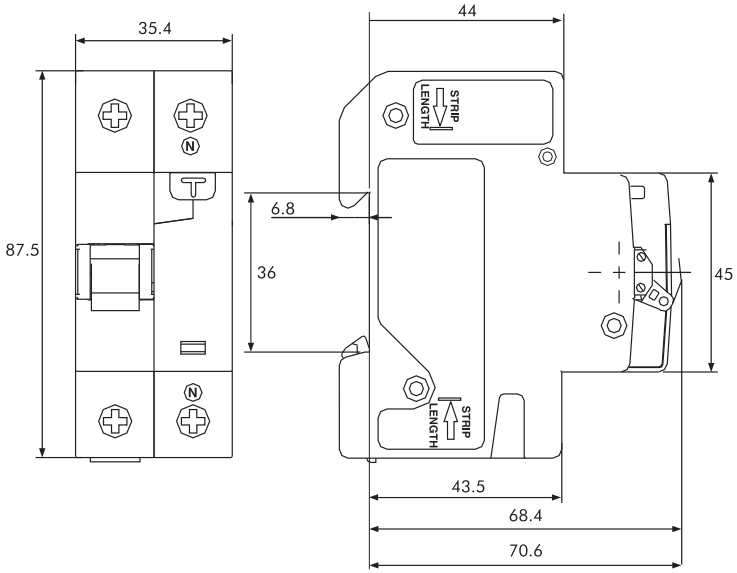


RCBO - A Type SPN

RCBO - A Type (SPN - 2M)
(In accordance with IS 12640-2 & IEC 61009-1) 240 V, 50 Hz, with 10 kA short circuit capacity

Rating	30 mA Cat. No.	100 mA Cat. No.	300 mA Cat. No.
6 A	DHCEACSN2030006	DHCEACSN2100006	DHCEACSN2300006
10 A	DHCEACSN2030010	DHCEACSN2100010	DHCEACSN2300010
16 A	DHCEACSN2030016	DHCEACSN2100016	DHCEACSN2300016
20 A	DHCEACSN2030020	DHCEACSN2100020	DHCEACSN2300020
25 A	DHCEACSN2030025	DHCEACSN2100025	DHCEACSN2300025
32 A	DHCEACSN2030032	DHCEACSN2100032	DHCEACSN2300032
40 A	DHCEACSN2030040	DHCEACSN2100040	DHCEACSN2300040

Dimensions (in mm)

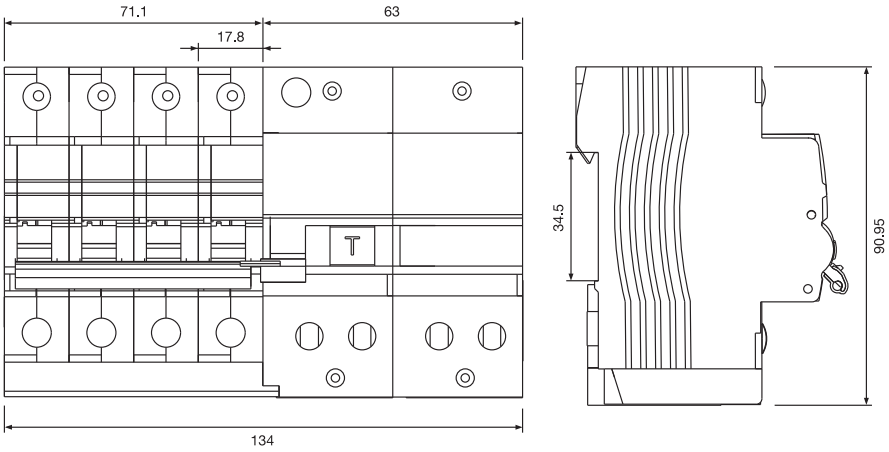


RCBO - TPN & FP

RCBO - A Type (TPN - 4M)
(In accordance with IS 12640-2 & IEC 61009-1) 415 V, 50 Hz, with 10 kA short circuit capacity

Rating	30 mA Cat. No.	100 mA Cat. No.	300 mA Cat. No.
32 A	DHBMACTN8030032	DHBMACTN8100032	DHBMACTN8300032
40 A	DHBMACTN8030040	DHBMACTN8100040	DHBMACTN8300040
63 A	DHBMACTN8030063	DHBMACTN8100063	DHBMACTN8300063

Dimensions (in mm)



RCBO - A Type TPN

RCBO - A Type (TPN - 4M)
(In accordance with IS 12640-2 & IEC 61009-1) 415 V, 50 Hz, with 10 kA short circuit capacity

Rating	30 mA Cat. No.	100 mA Cat. No.	300 mA Cat. No.
6 A	DHCEACTN4030006	DHCEACTN4100006	DHCEACTN4300006
10 A	DHCEACTN4030010	DHCEACTN4100010	DHCEACTN4300010
16 A	DHCEACTN4030016	DHCEACTN4100016	DHCEACTN4300016
20 A	DHCEACTN4030020	DHCEACTN4100020	DHCEACTN4300020
25 A	DHCEACTN4030025	DHCEACTN4100025	DHCEACTN4300025
32 A	DHCEACTN4030032	DHCEACTN4100032	DHCEACTN4300032
40 A	DHCEACTN4030040	DHCEACTN4100040	DHCEACTN4300040

Dimensions (in mm)