

IS 12640 (Part 2) : 2016/ IEC 61009-1 : 2012 Residual Current Operated Circuit-Breakers with Integral Overcurrent Protection for Household and Similar Uses (RCBOs) Part 2: General Rules

Residual Current Operated Circuit-Breakers (RCBOs) are a safety device used in electrical installations to protect people from electric shocks and to prevent electrical fires. It works by detecting current imbalances between the live (phase) and neutral conductors in a circuit. When an imbalance occurs, it disconnects the circuit, preventing potential harm or damage, thus providing protection against shock hazard or against fire hazards due to a persistent fault current. RCBOs also perform the function of making, carrying, and breaking overcurrents under specified conditions. Accordingly, RCBOs provide comprehensive protection for both electrical faults (such as leakage or earth faults) and overcurrent conditions (such as overloads or short circuits).

IS 12640 (Part 2) : 2016/ IEC 61009-1 : 2012 applies to residual current operated circuit breakers (RCBOs) with integral overcurrent protection functionally independent of, or functionally dependent on, line voltage for household and similar uses, for rated voltages not exceeding 440 V a.c. with rated frequencies of 50 Hz, 60 Hz or 50/60 Hz and rated currents not exceeding 125 A and rated short circuit capacities not exceeding 25 000 A for operation at 50 Hz or 60 Hz.

Tests prescribed in the standard are for verifying that RCBOs will trip under fault or overload conditions, preventing potential hazards. Tests assess the operational characteristics of RCBOs, i.e. their sensitivity and trip time, and performance under overload to ensure that they function correctly in real-world scenarios. The standard includes tests for mechanical and electrical endurance to confirm that RCBOs can withstand normal operational stresses and continue to function reliably over time. Tests specified also verify their performance under various environmental conditions (e.g., temperature, humidity) to ensure consistent operation regardless of the installation environment.

The standard specifies test sequence and number of samples to be submitted for full test procedure as well as simplified test procedure for the purpose of certification.

In electrical installations, the use of a residual current device as per the relevant standard is mandated under Regulation 44 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023.