



TESTING AND MEASURING EQUIPMENT/ALLOWED SUBCONTRACTING

Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs)

IEC 61009-1:2003 Edition 2.1 (incl. A1:2002)
IEC 61009-2-1:1991 and IEC 61009-2-2:1991

R=Required by Lab

S=May be subcontracted

Clause	Measurement / testing	Testing / measuring equipment / material needed	Subcontracting
6	Marking and other product information	Not required	R
8.1.1	General	Not required	R
8.1.2	Mechanism	Not required	R
8.1.3	Clearances and creepage distances	Normally slide-gauge	R
8.1.6	Non-interchangeability	Not required	R
9.3	Test of Indelibility of marking	Only chemicals	R
9.4	Test of reliability of screws, current-carrying parts and connections	screwdriver with torquemeter	R
9.5	Test of reliability of terminals for external conductors	Weights or spring scale, screwdriver with torquemeter	R
9.6	Verification of protection against electric shock	Standard test finger, unjointed test finger, indicator, heating cabinet	R
9.7	Test of dielectric properties		
9.7.1	Resistance to humidity	Humidity cabinet	R
9.7.2	Insulation resistance of the main circuit	DC source (500V) and instruments (or combination)	R
9.7.3 to 9.7.5	Dielectric strength	Adjustable high voltage test equipment (AC) up to 2500V	R
9.7.6	Capability of control circuits connected to the main circuit in respect of withstanding high d.c. voltages due to insulation measurements	DC source (600V/12mA) and instruments (or combination)	R
9.8	Test of temperature-rise	AC source up to 125A, resistive loads, temperature- and current-measuring instruments	R



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9.9	Verification of the operation characteristic		
9.9.1	Verification of the operating characteristic under residual current conditions	AC source up to 500A, resistive loads, heating cabinet, refrigerator, temperature-, current- , voltage- and time-measuring instruments	R



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9.9.2	Verification of the operating characteristic under overcurrent conditions	AC source up to 2500A, resistive loads, heating cabinet, refrigerator, temperature-, current-, voltage- and time-measuring instruments	R
9.10	Verification of mechanical and electrical endurance	Test apparatus according to method of actuating the circuit-breaker, AC source up to 125A/440V, resistive and inductive loads, current- and voltage-measuring instruments	R
9.11	Verification of the trip-free mechanism	AC source, measuring instruments	R
9.12	Short circuit tests	Test equipment for short-circuit tests, AC source up to 25000A/440V, resistive and inductive loads, current- and voltage-oscillating instruments	S
9.13	Resistance to mechanical shock and impact		
9.13.1	Mechanical shock	Specified test apparatus (figure 11)	R
9.13.2	Mechanical impact	Specified test apparatus (figure 12), weights or spring scale	R
9.14	Test of resistance to heat	Heating cabinet, standard test finger, apparatus for ball pressure test	R
9.15	Resistance to abnormal heat and to fire	Apparatus according to IEC60695-2-1	R
9.16	Verification of the operation of the test device at the limits of rated voltage	AC source, measuring instruments	R
9.17	Verification of the behaviour of RCBOs functionally dependent on line voltage, classified under 4.1.2.1, in case of failure of the line voltage	AC source, measuring instruments	R
9.18	Verification of the limiting value of overcurrent in case of single-phase load through a three-pole or four-pole RCBO	AC source, measuring instruments	R
9.19	Verification of behaviour of RCBOs in case of current surges caused by impulse voltages	Surge generator: up to 200A (0,5µs/100 kHz – ring wave) Surge generator: up to 3000A (8/20 µs)	R
9.20	Verification of resistance of the insulation against an impulse voltage	Surge generator: up to 8kV (1,2/50µs)	R
9.21	Verification of the behaviour of RCBOs in case of an earth fault current comprising d.c. components	AC source, measuring instruments, Thyristor with control unit for current delay angles	R
9.22	Verification of reliability		
9.22.1	Climatic test	Climatic chamber according to IEC 68-2-28, Recording system for temperature, humidity, pH and resistivity	R
9.22.2	Test with temperature of 40 °C	Heating cabinet, AC source, measuring instruments	R



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9.23	Verification of ageing of electronic components	Heating cabinet, AC source, measuring instruments	R
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Clause	Measurement / testing	Testing / measuring equipment / material needed	Subcontracting
Annex G	Additional requirements and tests for RCBOs consisting of a circuit-breaker and a residual current unit designed for assembly on site	Not required	R
Annex H	List of tests, additional test sequences and numbers of samples for verification of compliance of RCBOs with the requirements of electromagnetic compatibility (EMC)	Test equipment according IEC 61543	S