

TESTING AND MEASURING EQUIPMENT/ALLOWED SUBCONTRACTING

Low-voltage switchgear and controlgear assemblies

IEC 60439-1 3. Edition (1992-11) + Am.1 (1995) + Am.2 (1996)
IEC 60439-3 1. Edition (1990-12) + Am.1 (1993)

R=Required by Lab

S=May be subcontracted

Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
8.2.1	Temperature rise limits	1. Load resistors 2. Temperature acquisition unit 3. Current/voltage source	S
8.2.2	Dielectric properties	1. Impulse voltage generator (1,2/50 μ s) 2. Oscilloscope 3. High voltage probe 4. AC-voltage source (0 - min. 3,5 kV) 5. V-meter (min. 3,5 kV)	R
8.2.3	Short-circuit withstand strength	1. Short-circuit testing unit for currents higher 10 kA 2. Measuring devices for voltage, current, $\cos \varphi$, time, I^2t -values	S
8.2.4.1	Effective connection between the exposed conductive parts of the assembly and the protective circuit	1. Ω -meter	R
8.2.4.2	Short-circuit withstand strength of the protective circuit	Same as for 8.2.3	S
8.2.5	Clearances and creepage distances	1. Sliding gauge	R
8.2.6	Mechanical operation	No special measuring devices required	R

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8.2.7	Degree of protection	<ul style="list-style-type: none"> - Sphere 50 mm diameter - Jointed test finger - Test rod 2,5 mm diameter - Test wire 1,0 mm diameter - Sphere 12,5 mm diameter 	R
		<ul style="list-style-type: none"> - Dust chamber - Drip box - " -15° - Oscillating tube/spray ± 60° or spray nozzle/spray ± 60° - Oscillating tube/spray ± 180° - Water jet hose nozzle - nozzle 6,3 mm diameter - Water jet hose nozzle - nozzle 12,5 mm diameter - Immersion tank 	S
8.2.8	Construction and marking	No special measuring devices required	R
8.2.9	Impact strength	<ul style="list-style-type: none"> - Cooling chamber - Spring impact hammer 	R
8.2.10	Resistance to rusting	<ul style="list-style-type: none"> - Ammonium-Chlorid - Balance - Refined petrol or methylchloroform - Climatic chamber - Heating chamber 	R
8.2.11	Resistance of insulating materials to heat	<ul style="list-style-type: none"> - Heating chamber - Ball pressure test apparatus 	R
8.2.12	Resistance of insulating materials to abnormal heat and to fire	Glow wire test apparatus	R
8.2.13	Resistance to humidity ²	<ul style="list-style-type: none"> - Climatic chamber - AC-voltage source - V-meter 	R



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8.2.14	Mechanical strength of fastening means of enclosures	- Sliding gauge - Screwdriver or spanner for applying a torque	R

Note: The presence of equipment alone does not indicate a satisfactory situation. Assessors must evaluate the equipment design, calibration, uncertainty and documentation to ensure compliance with the directions of the standard. The requirements of ISO Guide 25 regarding validation are applicable, as the tests of this standard are not standardised tests.