



**TESTING AND MEASURING EQUIPMENT/ALLOWED SUBCONTRACTING**  
**IEC 60730-2-9:2008-06+A1:2011-02, Edition 3.0**  
**Automatic electrical controls for household and similar use**  
**Part 2-9: Particular requirements for temperature controls**

**R = Required to be at Lab**  
**S = May be subcontracted**  
**W = May be witnessed at MTL**  
**SF = Specialized Facility**  
**3PPS = Three Phase Power Supply required**

Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
3	General requirements	None	-
4	General notes on tests	None	-
5	Rating	None	-
6	Classification	None	-
7	Information	None	-
8	Protection against electric shock	Test finger (Fig. 2 of IEC 60730-1), force gauge, test pin (Fig. 1 of IEC 60730-1), milliammeter, voltmeter, ruler, micrometer	<b>R</b>
9	Provision of protective earthing	Ammeter, voltmeter	<b>R</b>
		Appropriate material analyzing equipment (e.g. scanning electron microscope, energy dispersive x-ray spectrometer)	<b>S</b>
10	Terminals and terminations	According to IEC 60998, Torque tester, force gauge tester, screwdriver, micrometer, ruler, flexing tester	<b>R</b>
11	Construction requirements	Electric strength tester, HV test supply, isolation transformer, insulation tester, DC voltage supply, flexing tester, voltmeter, ammeter, freezer chamber, temperature recorder, torque tester, force gauge, time clock, test fingernail	<b>R</b>

Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
12	Moisture and dust resistance	According to IEC 60529, electric strength tester, conditioning chambers: heater/humidity, leakage current meter	<b>R</b>
13	Electric strength and insulation resistance	Insulation tester, electric strength tester, leakage current tester	<b>R</b>
14	Heating	Temperature meter/recorder, fine wire thermocouples, winding resistance measurement system, environmental chambers (heat, freeze), current loads per ratings, voltmeter, ammeter	<b>R</b>
15	Manufacturing deviation and drift	Voltmeter, ammeter Temperature chamber (heat, cold) Temperature meter/recorder Remark: For those types of controls for which the atmospheric pressure is relevant for the determination of the manufacturer deviation and drift the atmospheric pressure has to be measured by a pressure meter or alternatively it is acceptable to get the information about the atmospheric pressure online via local metrological service.	<b>R</b>
16	Environmental stress	Environmental chambers – heat, freeze, humidity	<b>R</b>
17	Endurance	Environmental chambers – heat, freeze, humidity, voltmeter, ammeter, power analyzer meter, oscilloscope, inductive loads, resistive loads, pilot duty loads, motor loads	<b>R</b> <b>3PPS</b>
18	Mechanical strength	Apparatus in IEC 60068-2-75, impact tester (Fig. 4 of IEC 60730-1), tumbling barrel (Fig. 5 of IEC 60730-1), force tester, torque tester, pull tester.	<b>R</b>
19	Threaded parts and connections	Screwdrivers, torque tester	<b>R</b>
20	Creepage distances, clearances and distances through solid insulation	Measuring ruler, force tester, test finger (Fig. 2), impulse voltage tester, electric voltage tester, insulation resistance meter, oscilloscope, electric strength tester, micrometer	<b>R</b>
21	Resistance to heat, fire and tracking	Ball pressure test apparatus in accordance with figure 6 of IEC 60730-1, glow wire test apparatus, environmental chamber or heating cabinet, tracking test apparatus, voltmeter, ammeter	<b>R</b>
22	Resistance to corrosion	Humidity chamber, heating cabinet	<b>R</b>
23	EMC requirements – emission	Apparatus in accordance with CISPR 14-1. Equipment in accordance with Clause 17 of IEC 60730-1, oscilloscope	<b>S</b>

Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
24	Components	Test apparatus in accordance with IEC 60742 and other IEC component standards	<b>S</b>
25	Normal operation	Refer to Annex H of IEC 60730-1	-
26	EMC requirements – immunity	Refer to Annex H of IEC 60730-1	-
27	Abnormal operation	Voltmeter, ammeter, electric strength tester	<b>R</b>
28	Guide of the use of electronic disconnection	Refer to Annex H of IEC 60730-1	-
Annex A	Indelibility of Marking	Refer to IEC 60730-1	<b>R</b>
Annex B	Measurement Guide	None	-
Annex C	Cotton for Mercury Switch Test	Common as described in Annex C of IEC 60730-1	<b>R</b>
Annex D (informative)	Heat, fire and tracking	Informative guide – None	-
Annex E	Circuit for measurement leakage current	Circuit apparatus according to Figure E1 of IEC 60730-1	<b>R</b>
Annex F (informative)	Heat-Fire-Resistance categories	Informative guide – None	-
Annex G	Heat-Fire-Resistance Tests	Glow-wire test apparatus, PTI Test apparatus	<b>R</b>
Annex H	Requirements for Electronic Controls	Refer to Annex H, sub-clauses below:	-
H8	Protection against electric shock	Leakage current meter	<b>R</b>
H11	Constructional requirements	Ammeter, voltmeter, chart recorder	<b>R</b>
H13	Electric strength and insulation resistance	Same as Clause 13 above	<b>R</b>
H17	Endurance	Thermal cycling test apparatus	<b>R</b>
H18	Mechanical Strength	Refer to Clause 18 above	<b>R</b>
H20	Creepage distance, clearance and distance through insulation	Refer to Clause 20 above	<b>R</b>
H21	Resistance to heat, fire and tracking	Refer to Clause 21 above	<b>R</b>
H22	EMC requirements – emission	Refer to Clause 23 above	<b>S</b>
H23	Normal Operation	Oscilloscope, ammeter, voltmeter	<b>R</b>
H26	EMC requirements – immunity	Environmental chamber, voltage dips and short voltage interruption apparatus, variable voltage supply, 3-phase auto-transformer, surge test apparatus, fast transient/burst test apparatus, ring wave surge test apparatus, conducted radiofrequency test apparatus radiated EM field test apparatus	<b>S</b>
H27	Abnormal Operation	Voltmeter, ammeter, oscilloscope, temperature meter	<b>R</b>

Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
H28	Guide on use of electronic disconnection	None	-
Annex J	Requirements for controls using thermistors	Same which are used for clauses 8 through 28	<b>R</b>
Annex K (informative)	Nominal voltages	None	-
Annex L	Overvoltage categories	None	-
Annex M (informative)	Typical usage	None	-
Annex N	Pollution degree	None	-
Annex P	Printed circuit board coating performance test	Heating chamber, humidity chamber, environmental cycling chamber, electric strength tester	<b>R</b>
Annex Q	Printed circuit board coating performance test	Freezing chamber, environmental cycling chamber, electric strength tester, freezing chamber	<b>R</b>
Annex R (informative)	Explanatory notes for surge immunity test	None	-
Annex S (informative)	Guidance for applying Clause 20	None	-
Annex T	Requirements for SELV and PELV	None	-
Annex U	Requirements for relays when used as controls in IEC 60335 appliances	Same which are used for clauses 7 through 28	<b>R</b> <b>3PPS</b>
Annex AA (informative)	Maximum manufacturing deviation and drift	None	-
Annex BB (informative)	Time factor	None	-
Annex CC (informative)	Number of cycles	None	-
Annex DD (informative)	Controls for use in agricultural confinement buildings	None	-
Annex EE (informative)	Guide to the application of temperature sensing controls within the scope of IEC 60730-2-9	None	-