



TESTING AND MEASURING EQUIPMENT/ALLOWED SUBCONTRACTING

IEC 60730-2-8:2003-01, Edition 2.1

Automatic electrical controls for household and similar use

Part 2-8: Particular requirements for electrically operated water valves including mechanical requirements

R = Required by Lab

S = May be subcontracted

3PPS = Three Phase Power Supply required

NA = Not applicable

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), milliampmeter, voltmeter, ruler, micrometer	R
9	Provision of protective earthing	Ammeter, voltmeter, corrosion resistance analysis materials	R
10	Terminals and terminations	According to IEC60998, Torque tester, force gauge tester, screwdriver, micrometer, ruler, flexing tester	R



Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
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, vernier callipers or suitable measuring instrument, micrometer, pressure gauge	R
12	Moisture and dust resistance	According to IEC60529, electric strength tester, conditioning chambers: heaterhumidity, leakage current meter	R
13	Electric strength and insulation resistance	Insulation tester, electric strength tester, leakage current tester	R
14	Heating	Temperature meter/recorder, fine wire thermocouples, winding resistance measurement system, environmental chambers (heat, freeze), current loads per ratings, voltmeter, ammeter	R
15	Manufacturing deviation and drift	Environmental chamber (heat, cold, humidity), voltmeter, ammeter, temperature meter/recorder, humidity meter, pressure meter, recorders, oscilloscope.	R
16	Environmental stress	Environmental chambers – heat, freeze, humidity	R
17	Endurance	Environmental chambers – heat, freeze, humidity. Pressure meter, voltmeter, ammeter, power analyzer meter, oscilloscope, inductive loads, resistive loads, pilot duty loads, motor loads. Activation source and cycling mechanism as required in annex –BB- or –EE-.	R 3PPS
18	Mechanical strength	Apparatus in IEC60068-2-75, impact tester (Fig. 4 of IEC 60730-1), tumbling barrel (Fig. 5 of IEC 60730-1), force tester, torque tester, pull tester. Additional requirements according to annexes –BB-, -CC-, –DD- and –EE-	R S
19	Threaded parts and connections	Screwdrivers, torque tester	R
20	Creepage distances, clearances and distances through solid insulation	Measuring ruler, force tester, test finger (Fig. 2 of IEC 60730-1), impulse voltage tester, electric voltage tester, insulation resistance meter, oscilloscope, electric strength tester, micrometer, vernier callipers	R



Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
21	Resistance to heat, fire and tracking	Ball pressure test apparatus in accordance with figure 6 of IEC 60730-1, horizontal burning test apparatus (Annex G of IEC 60730-1) and needle flame apparatus, glow wire test apparatus, environmental chamber or heating cabinet, tracking test apparatus, voltmeter, ammeter	R
22	Resistance to corrosion	Humidity chamber, heating cabinet	R
23	EMC requirements – emission	Apparatus in accordance with CISPR14-1. Equipment in accordance with Clause 17 of IEC 60730-1, oscilloscope	S
24	Components	Test apparatus in accordance with IEC60742 and other IEC component standards	S
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	R
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	R
Annex B	Measurement Guide	None	-
Annex C	Cotton for Mercury Switch Test	Common as described in Annex C of IEC 60730-1	R
Annex D (informative)	Heat, fire, and tracking	Arc-tracking resistance apparatus High voltage-arc resistance apparatus Aging chambers, tensile tester, electric strength tester, flexural strength tester, izod impact tester, flame test burner, insulation resistance measuring apparatus, CTI testing apparatus, apparatus for tests in Table D2 of IEC 60730-1.	R
Annex E	Circuit for measurement leakage current	Circuit apparatus according to Figure E1 of IEC 60730-1	R
Annex F	Heat-Fire Resistance Categories	Informative guide – None	-
Annex G	Heat-Fire Resistance Tests	Needle flame apparatus, glow-wire test apparatus, PTI Test apparatus	R
Annex H	Requirements for Electronic Controls	Refer to Annex H, sub-clauses below:	-
H8	Protection against electric shock	Leakage current meter, capacitance measuring instrument	R



Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
H11	Constructional requirements	Ammeter, voltmeter, chart recorder	R
H13	Electric strength and insulation resistance	Same as Clause 13 above	R
H17	Endurance	Thermal cycling test apparatus	R
H18	Mechanical Strength	Refer to Clause 18 above	R
H20	Creepage distance, clearance and distance through insulation	Refer to Clause 20 above	R
H21	Resistance to heat, fire and tracking	Refer to Clause 21 above	R
H22	EMC requirements – emission	Refer to Clause 23 above	S
H23	Normal Operation	Oscilloscope, ammeter, voltmeter	R
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, programmable logic controllers or similar equipment.	S
H27	Abnormal Operation	Voltmeter, ammeter, oscilloscope, temperature meter	R
H28	Guide on use of electronic disconnection	None	-
Annex J	Requirements for controls using thermistors	Same which are used for clauses 8 through 28	R
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.	R
Annex Q	Printed circuit board coating performance test	Freezing chamber, environmental cycling chamber, electric strength tester, freezing chamber	R



Clause	Measurement/testing	Testing / measuring equipment / material needed	Subcontracting
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	R 3PPS
Annex AA (informative)	Relation between different flow coefficients	None	-
Annex BB	Arrangement for measurement of transient pressure caused by water valves	Test bench as discribed in the arrangements	R
Annex CC	Test on valve bodies of thermoplastic material intended to be connected to the water supply mains	Temperature meter/recorder, fine wire thermocouples, pressure measurement system, environmental heating chamber, voltmeter,	R S
Annex DD	Torque test for valves with internally threaded end-conections to ISO 7-1	Force tester, torque tester	R
Annex EE	Arrangement for measurement of transient pressure caused by water valves with a declared pressure of up to and including 1,0 MPa (10 bar)	Test bench as discribed in the arrangements	R