

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 2
AMENDEMENT 2

**Automatic electrical controls for household and similar use –
Part 2-8: Particular requirements for electrically operated water valves, including
mechanical requirements**

**Dispositifs de commande électrique automatiques à usage domestique et
analogue –**

**Partie 2-8: Règles particulières pour les électrovannes hydrauliques, y compris
les prescriptions mécaniques**



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 97.120

ISBN 978-2-8322-3015-2

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FOREWORD

This amendment has been prepared by IEC technical committee 72: Automatic electrical controls.

The text of this amendment is based on the following documents:

FDIS	Report on voting
72/1011A/FDIS	72/1025/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

FOREWORD

Replace the paragraph reading "This part 2-8 is intended...", as amended in Amendment 1:2002, with the following new paragraph:

This part 2-8 is intended to be used in conjunction with IEC 60730-1. It was established on the basis of the fourth edition (2010) of that publication. Consideration may be given to future editions of, or amendments to IEC 60730-1.

Replace the "in some countries" notes, as amended in Amendment 1:2002, as follows:

Replace "table 7.2" by "Table 1" in the first item.

Replace "27.2.101.1" by "27.2.3.1" in the fourth item.

Delete the fifth item and sixth items, "27.101" and "H.26.2.1".

1 Scope and normative references

Replace the first sentence (including the term "Replacement") by the following:

This clause of part 1 is applicable except as follows:

Replace the first paragraph of 1.1 by the following:

1.1 This part 2-8 applies to electrically operated water valves for use in, on or in association with equipment for household and similar use, including heating, air-conditioning and similar applications. The equipment may use electricity, gas, oil, solid fuel, solar thermal energy, etc., or a combination thereof.

Replace Subclauses 1.1.1 and 1.1.2 by the following:

1.1.1 This part 2-8 applies to the inherent safety, to the operating values, operating times, and operating sequences where such are associated with equipment safety, and to the testing of automatic electrical control devices used in, or in association with, household or similar equipment.

This part 2-8 contains requirements for electrical features of water valves and requirements for mechanical features of valves that affect their intended operation.

This part 2-8 is also applicable to electrically operated water valves for appliances within the scope of IEC 60335.

Electrically operated valves for equipment not intended for normal household use but which may nevertheless be used by the public, such as equipment intended to be used by laymen in shops, in light industry and on farms, are within the scope of this part 2-8.

This part 2-8 does not apply to:

- electrically operated water valves of nominal connection size above DN 50;
- electrically operated water valves for admissible nominal pressure rating above 1,6 MPa;
- food dispensers;
- detergent dispensers;
- steam valves;
- electrically operated water valves designed exclusively for industrial applications.

1.1.2 Throughout this part 2-8, where it can be used unambiguously, the term:

- "valve" is used to denote an electrically operated water valve (including actuator and valve body assembly);
- "actuator" means "electrically operated mechanism or prime mover";
- "valve body" means "valve body assembly";
- "equipment" includes "appliance" and "control system".

1.5 Normative references

Add the following new references:

IEC 60730-1:2010, *Automatic electrical controls – Part 1: General requirements*

IEC 60335 (all parts), *Household and similar electrical appliances – Safety*

Replace the reference to IEC ISO 228-1:1994 by the following:

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances and designation*

Replace the reference to IEC ISO 630:1995 by the following:

ISO 630, *Structural steels – Plates, wide flats, bars sections and profiles*

Replace the reference to IEC ISO 1179:1981 by the following:

ISO 1179-1, *Connections for general use and fluid power – Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing – Part 1: Threaded ports*

Replace the reference to IEC ISO 4144:1979 by the following:

ISO 4144, *Pipework – Stainless steel fittings threaded in accordance with ISO 7-1*

Replace the reference to IEC ISO 4400:1994 by the following:

ISO 4400, *Fluid power systems and components – Three-pin electrical plug connectors with earth contact – Characteristics and requirements*

Replace the reference to IEC ISO 6952:1994 by the following:

ISO 6952, *Fluid power systems and components – Two-pin electrical plug connectors with earth contact – Characteristics and requirements*

6 Classification

6.8 According to protection against electric shock

6.8.3 Replacement:

Delete “Additional subclauses” and the list of subclauses that follows.

7 Information

Table 7.2

Make the following changes to the table:

Renumber the table as "Table 1".

Requirement 7, under the column "Clause or subclause", add "23.1.1".

Delete line of requirement 23.

Requirement 29, under the column "Clause or subclause", add "2.4".

Requirement 40, under the column "Clause or subclause", add "11.4".

Requirement 41, under the column "Clause or subclause", add "2.11.1".

Requirement 42, under the column "Clause or subclause", add "2.11.2".

Replace requirement "46 to 48" by "47"

Requirement 104, under the column "Clause or subclause", replace "2.3.116" by "2.3.29".

Requirement 109, under the column "Information", replace "Annex AA" with "Annex BB".

Add the following new requirement:

Requirement	Information	Clause or subclause	Method
115	Water valve intended to be used in accordance with IEC 60335	18.101.3	D

7.4 Additional requirements for marking

Replace the existing text by the following:

This clause of part 1 is applicable except as follows:

7.4.4 is not applicable.

14 Heating

14.4.101

Replace, in the second sentence, "table 14.1" by "Table 13".

Replace, in the third sentence, "requirements of 27.2.101" by "requirements of 27.2.3 and 27.2.101 if applicable".

14.4.102

Replace, in the first sentence, "table 14.1" by "Table 13".

Replace, in the second sentence, "requirements of 27.2.101" by "requirements of 27.2.3 and 27.2.101 if applicable".

14.5.104

Replace "table 14.1" by "Table 13".

14.5.105

Replace, in the note, as introduced in Amendment 1:2002, "table 7.2" by "Table 1".

14.5.106

Replace, in the note, as introduced in Amendment 1:2002, "table 7.2" by "Table 1".

14.5.107

Replace, in the first line, as introduced in Amendment 1:2002, "table 7.2" by "Table 1".

14.7.4

Replace "table 14.1" by "Table 13" in three places.

17 Endurance

17.7 Over-voltage (or in some countries, overload) test of automatic action at accelerated rate

Replace, in the first sentence of the first paragraph "table 7.2" by "Table 1".

Replace, in the first sentence of the third paragraph, "as a guidance" by "as guidance".

18 Mechanical strength

18.101.3 Anti-water hammer characteristics

Add, at the end of the last sentence in the compliance statement "in Table 1, requirement 115" to read:

"... within the scope of IEC 60335-1, if declared, in Table 1, requirement 115".

18.102 Wetted material specifications

Delete "Under consideration."

18.103.5

Replace, in the first listed item, "table 7.2" by "Table 1".

27 Abnormal operation

Delete, just before 27.2, the word "Replacement".

27.2 Blocked mechanism test

Replace the title and text by the following:

27.2 Burnout test

Replacement:

Valves incorporating solenoids and valves incorporating motors shall withstand the effect of blocking of the valve mechanism.

For valves where an external mechanical blockage will not cause an internal overload of the valve due to decoupling of the external blockage to the internal mechanical structure, e.g. a clutch, a blockage of the mechanical parts between the motor and the decoupling means shall be tested.

Compliance is checked by the tests of 27.2.1 and 27.2.2.

27.2.1

Replace "table 7.2" by "Table 1" in the first paragraph.

27.2.2

Replace the existing text with the following:

Replacement:

After this test, the valve shall comply with items a) to g) of H.27.1.1.3, where applicable.

NOTE The valve need not be operative following the test.

Add the following:

27.2.3 Blocked mechanical output test (abnormal temperature test)

Replacement:

Valves with motorized electrical actuators shall withstand the effects of blocked output without exceeding the temperatures indicated in Table 101. Temperatures are measured by the method specified in 14.7.1.

NOTE This test is not conducted on valves which meet the requirements of 14.4.101.

27.2.3.1

Modification:

Replace the first and second paragraph by the following:

Valves are tested for 24 h or until thermal equilibrium has been reached with the output blocked in the most unfavorable position at rated voltage and in a room temperature in the range of 15 °C to 30 °C, the resulting measured temperature being corrected to a 25 °C reference value.

NOTE 1 In Canada and the USA, the test is conducted at the voltages indicated in 17.2.3.1 and 17.2.3.2.

NOTE 2 This test is not applicable to valves identified under requirement 113 of Table 1.

Add the following Table 101 (Table 27.2.101 of Ed.2.1):

Table 101 – Maximum winding temperature (for test of blocked output conditions and valves declared under Table 1, item 113)

Condition	Temperature of insulation by class ^d							
	°C							
	A	E	B	F	H	200	220	250
If impedance protected:	150	165	175	190	210	230	250	280
If protected by protective devices:								
during first hour								
– maximum value ^{a b}	200	215	225	240	260	280	300	330
after first hour								
– maximum value ^a	175	190	200	215	235	255	275	305
– arithmetic average ^{a c}	150	165	175	190	210	230	250	280
^a Applicable to actuators with thermal motor protection.								
^b Applicable to actuators protected by incorporated fuses or thermal cut-outs.								
^c Applicable to actuators with no protection.								
^d These classifications correspond to the thermal classes specified in IEC 60085.								

27.2.101 Blocked output test (temperature)

Replace the title and text of this subclause with the following:

27.2.101 Test on three phase valve

27.2.101.1 *With any one phase disconnected, the valve is operated under normal operation and supplied at rated voltage until thermal equilibrium has been reached.*

The temperature of the winding shall not exceed the temperatures indicated in Table 101. Temperatures are measured by the method specified in 14.7.1.

27.3 Overvoltage and undervoltage test

Replace, in the first compliance paragraph in three places "table 7.2" by "Table 1".

27.101 Dry condition test

Replace, in the first sentence, "table 7.2" by "Table 1".

27.101.2

Replace the existing text by the following new text:

The water valve, connected but without water, is energized at rated frequency and rated voltage. The valve is operated:

- at the ambient temperature, and
- considering any limitation of the operating time (duty cycle).

The duration of the test is either 4 h or until the steady temperature state is reached, whichever occurs first.

The temperature measured shall comply with the temperatures indicated in Table 101.

Add the following:

27.102 Running overload

27.102.1 The running overload test is carried out on valves that are intended to be remotely or automatically controlled or liable to be operated continuously in unattended mode if overload protective devices relying on electronic circuits to protect the motor windings, other than those that sense winding temperatures directly, are also subjected to the running overload test.

27.102.2 The valve is operated under normal operation conditions and supplied at rated voltage until steady conditions are established. The load is then increased so that the current through the motor windings is raised by 10 % increments and the valve is operated again until steady conditions are established, the supply voltage being maintained at its original value.

27.102.3 During the test, the winding temperature shall not exceed

- 140 °C, for class 105 (A) winding insulation;
- 155 °C, for class 120 (E) winding insulation;
- 165 °C, for class 130 (B) winding insulation;
- 180 °C, for class 155 (F) winding insulation;
- 200 °C, for class 180 (H) winding insulation;
- 220 °C, for class 200 (N) winding insulation;
- 240 °C, for class 220 (R) winding insulation;
- 270 °C, for class 250 winding insulation.

NOTE If the load cannot be increased in appropriate steps, the motor may be removed from the appliance and tested separately.

27.102.4 For valves which are used in a continuously operation for longer than 24 h without interruption, the load is again increased and the test is repeated until the protective device operates or the motor stalls.

27.102.5 For valves which are used in operation mode which will not exceed for longer than 24 h without interruption, the test is repeated after the winding temperature has reached

environmental temperature conditions. The test will be performed with an increased load so that the current through the motor windings is raised by 10 % increments. The valve is operated again until steady conditions are established, the supply voltage being maintained at its original value. This procedure will be repeated until the protective device operates or the motor stalls.

Annex H – Requirements for electronic controls

H.7 Information

Replace, in the first sentence, "table 7.2" by "Table 1".

H.11 Constructional requirements

Delete Clause H.11 in its entirety.

H.26 Electromagnetic compatibility (EMC) requirements – immunity

H.26.2.1

Delete the following: (introduced in Amendment 1:2002):

“Add the following, explanatory notes:

Electrically operated water valves are type 1 action, therefore only H.26.8, H.26.9 and H.26.13.1 are applicable. H.26.10 is an alternate to H.26.9.

In Canada and the USA, clause H.26.10 is required.”

Add the following:

H.26.5 Voltage dips and voltage interruptions in the power supply network

H.26.5.3 Test procedure

Addition:

Each test is performed three times.

Add the following:

H.26.5.3.101 Compliance

After the test according to H.26.5.3 of all the voltage dips and the voltage interruption of more than one cycle of the supply waveform, the electric actuator shall provide normal operation.

During the test according to H.26.5.3 of an interruption of one cycle of the supply waveform, the control shall continue to operate after restoration of the supply voltage from the position the electric actuator was in right before the interruption.

Add the following:

H.26.6 Not applicable.

H.26.8 Surge immunity test