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Responsible committee: CPL/72 Electrical control devices for household equipment and appliances

Interested committees:

Title: Draft BS EN 60730-2-8 Ed.3.0 Automatic electrical controls for household and similar use. Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements.

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- i) has any issues related to 3rd party IPR, patent or copyright
- ii) affects other national standard(s)
- iii) requires additional national guidance or information

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Introduction

This draft standard is based on European discussions in which the UK has taken an active part. Your comments on this draft are welcome and will assist in the preparation of the consequent British Standard. Comment is particularly welcome on national, legislative or similar deviations that may be necessary.

Even if this draft standard is not approved by the UK, if it receives the necessary support in Europe, the UK will be obliged to publish the official English Language text unchanged as a British Standard and to withdraw any conflicting standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with reasons) or positive vote on this draft.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:

IEC 60730-2-8 ED3

DATE OF CIRCULATION:

2017-06-30

CLOSING DATE FOR VOTING:

2017-09-22

SUPERSEDES DOCUMENTS:

72/1076/RR

IEC TC 72 : AUTOMATIC ELECTRICAL CONTROLS	
SECRETARIAT: United States of America	SECRETARY: Mr Joseph Musso
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☒ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

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

NOTE FROM TC/SC OFFICERS:

THIS DOCUMENT IS BASED UPON:

72/901/DC – 72/932/INF

72/1048/DC – 72/1070/INF

72/1069/DC – 72/1075/INF

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

AUTOMATIC ELECTRICAL CONTROLS –**Part 2-8: Particular requirements for electrically operated water valves,
including mechanical requirements**

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International Standard IEC 60730-2-8 has been prepared by IEC technical committee 72: Automatic electrical controls

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This part 2-8 is intended to be used in conjunction with IEC 60730-1. It was established on the basis of the fifth edition (2013) including AMD1 (2015) of that publication. Consideration may be given to future editions of, or amendments to, IEC 60730-1.

This part 2-8 supplements or modifies the corresponding clauses in IEC 60730-1 so as to convert that publication into the IEC standard: *Safety requirements for electrically operated water valves, including mechanical requirements*.

Where this part 2-8 states "addition", "modification", or "replacement", the relevant requirement, test specification or explanatory matter in part 1 should be adapted accordingly.

Where no change is necessary, part 2-8 indicates that the relevant clause or subclause applies.

In the development of a fully international standard, it has been necessary to take into consideration the differing requirements resulting from practical experience in various parts of the world and to recognize the variation in national electrical systems and wiring rules.

The "in some countries" notes regarding differing national practices are contained in the following elements:

- Table 1, footnotes 102 and 103
- table 13, footnote 101
- 16.2.1
- 27.2.3.1
- table DD.1.2.1, footnote a
- table DD.6, footnote a

In this publication:

- 1) The following print types are used:
 - Requirements proper: in roman type.
 - *Test specifications: in italic type.*
 - Notes: in smaller roman type.
 - Defined terms: in **bold type**
- 2) Subclauses, notes, tables or figures which are additional to those in part 1 are numbered starting from 101, additional annexes are lettered AA, BB, etc.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the stability date indicated on the IEC web site 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.

The National Committees are requested to note that for this publication the stability date is 2020.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE

AUTOMATIC ELECTRICAL CONTROLS –

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

1 Scope and normative references

This clause of part 1 is applicable except as follows:

1.1 Scope

Replacement:

This standard 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.

NOTE 1 Throughout this standard the word "equipment" means "appliances and equipment."

This International Standard is applicable to electrically operated water valves for building automation within the scope of ISO 16484.

This standard also applies to automatic electrically operated water valves for equipment that may be used by the public, such as equipment intended to be used in shops, offices, hospitals, farms and commercial and industrial applications.

EXAMPLE 1 Electrically operated water valves for commercial catering, heating and air-conditioning equipment.

This standard does not apply to electrically operated water valves intended exclusively for industrial process applications unless explicitly mentioned in the relevant equipment standard.

This standard applies to electrically operated water valves powered by primary or secondary batteries, requirements for which are contained within the standard, including Annex V.

This standard does not cover the prevention of contamination of drinking water as a result of contact with materials.

1.1.1 This standard 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, on or in association with, household and similar equipment.

This standard contains requirements for electrical features of water valves and requirements for mechanical features of valves that affect their intended operation.

This standard is also applicable to electrically operated water valves for appliances within the scope of the IEC 60335 series of standards.

This standard 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;

- 41 – steam valves;
- 42 – electrically operated water valves designed exclusively for industrial applications.

43 Throughout this standard, where it can be used unambiguously, the term:

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

49 **1.1.2** This standard applies to electrically operated water valves, responsive to or controlling such
50 characteristics as temperature, pressure, passage of time, humidity, light, electrostatic effects, flow, or
51 liquid level, current, voltage, acceleration, or combinations thereof.

52 **1.1.3** This standard also applies to actuators and to valve bodies which are designed to be fitted to
53 each other.

54 **1.1.4** This standard applies to individual valves, valves utilized as part of a system and valves
55 mechanically integral with multi-functional controls having non-electrical outputs.

56 NOTE Attention is drawn to the fact that, in many countries, additional test requirements and by-laws have been established
57 by the water authorities or companies.

58 **1.1.5** This standard applies to a.c. or d.c. powered electrically operated water valves with a rated
59 voltage not exceeding 690 V a.c. or 600 V d.c.

60 **1.1.6** This standard does not take into account the **response value** of an **automatic action** of a
61 valve, if such a **response value** is dependent upon the method of mounting the valve in the
62 equipment. Where a **response value** is of significant purpose for the protection of the **user**, or
63 surroundings, the value defined in the appropriate equipment standard or as determined by the
64 manufacturer shall apply.

65 **1.1.7** This standard applies also to electrically operated water valves incorporating **electronic**
66 **devices**, requirements for which are contained in Annex H.

67 **1.1.8** This standard applies also to electrically operated water valves using NTC or PTC **thermistors**,
68 requirements for which are contained in Annex J.

69 **1.1.9** This standard applies to the electrical and **functional safety** of electrically operated water
70 valves capable of receiving and responding to communications signals, including signals for power
71 billing rate and demand response.

72 The signals may be transmitted to or received from external units being part of the valve (wired), or to
73 and from external units which are not part of the valve (wireless) under test.

74 **1.1.10** This standard does not address the integrity of the output signal to the network devices, such
75 as interoperability with other devices unless it has been evaluated as part of the **control system**.

76 **1.2 Normative references**

77 This clause of part 1 is applicable except as follows:

78 *Addition:*

79 ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads – Part 1: Dimensions,*
80 *tolerances and designation*

- 81 ISO 65:1981, *Carbon steel tubes suitable for screwing in accordance with ISO 7-1*
- 82 ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions,*
83 *tolerances and designation*
- 84 ISO 630, *Structural steels – Plates, wide flats, bars sections and profiles*
- 85 ISO 1179-1, *Connections for general use and fluid power – Ports and stud ends with ISO 228-1*
86 *threads with elastomeric or metal-to-metal sealing – Part 1: Threaded ports*
- 87 ISO 4144, *Pipework – Stainless steel fittings threaded in accordance with ISO 7-1*
- 88 ISO 4400, *Fluid power systems and components – Three-pin electrical plug connectors with earth*
89 *contact – Characteristics and requirements*
- 90 ISO 6952, *Fluid power systems and components – Two-pin electrical plug connectors with earth*
91 *contact – Characteristics and requirements*

92 **2 Definitions**

93 This clause of part 1 is applicable, except as follows:

94 **2.2 Definitions of types of control according to purpose**

95 **2.2.17** 96 **electrically operated valve**

97 *Addition:*

98 Note 1 to entry: A semi-automatic valve that is opened manually and closes automatically or vice versa is also covered by
99 this definition.

100 *Additional definitions:*

101 **2.2.17.101** 102 **valve**

103 device consisting of an actuator connected to a valve body assembly and used to stop or regulate flow
104 of fluid by the closure or partial closure of an orifice

105 **2.2.17.102** 106 **water valve**

107 valve intended to be connected to a water supply and to control water flow

108 **2.2.17.103** 109 **heating-water valve**

110 valve intended to control the water circulation in heating systems

111 **2.2.17.104** 112 **actuator**

113 electrically operated mechanism or prime mover used to effect the opening or closing action of a valve

114 Note 1 to entry: An actuator may be integral with the valve, fixed to the valve body assembly or delivered as a separate
115 component.

116 Note 2 to entry: An actuator may also include the valve and closure member.

117 **2.2.17.105** 118 **valve body assembly**

119 assembly comprising the valve body, inlet and outlet end connections, the valve seat, closure member
120 and stem or shaft

121 Note 1 to entry: In some cases, the stem and closure member may be part of the actuator.

2.2.17.106**valve body**

part of the valve body assembly which is the main pressure boundary. It provides the water flow passage-ways with end connections

2.2.17.107**nominal size**

numerical designation of size which is common to all components in a fluid-conducting system other than components designated by outside diameter or by thread size

Note 1 to entry: It may be designated by "DN" followed by a convenient round number, for reference purposes only.

Note 2 to entry: Some older international standards refer to nominal size as nominal diameter but, for the purpose of this standard, the two terms are synonymous.

2.2.17.108**nominal pressure rating**

numerical designation of pressure rating

Note 1 to entry: It may be designated by the letters "PN" (also referred to as the pressure number) followed by a convenient round number, for reference purposes only.

2.2.17.109**end connection**

valve body configuration provided to make a pressure-tight joint to the fluid-conducting system

2.2.17.110**valve seat**

surface of the orifice within the valve which makes full contact with the closure member

2.2.17.111**closure member**

movable part of the valve which is positioned in the flow path to modify the rate of flow through the valve

Note 1 to entry: A closure member may be a plug, ball, disc, vane, gate, etc.

2.2.17.112**stem**

component which connects the actuator to, and positions, the closure member

Note 1 to entry: For rotary valves the word "shaft" should be used in place of "stem".

Note 2 to entry: In some controls the stem may be part of the actuator.

2.2.17.113**fitting**

any device such as a reducer, expander, elbow, or T-piece which is attached directly to an end-connection of the valve body assembly

2.3 Definitions relating to the function of controls**2.3.29**

Amend the existing definition as follows:

Delete "maximum rated pressure".

Additional definitions:

2.3.101**on-off valve**

valve which is open or closed, without any intermediate positions

- 166 **2.3.102**
167 **normally closed valve**
168 valve which is closed when not electrically energized
- 169 **2.3.103**
170 **normally open valve**
171 valve which is open when not electrically energized
- 172 **2.3.104**
173 **modulating valve**
174 valve which has a variable flow rate between predetermined flow limits
- 175 **2.3.105**
176 **diverting valve**
177 valve with one or more inputs and outputs which may permit flow from any combination of inputs to
178 outputs
- 179 **2.3.106**
180 **closed position**
181 position of the closure member when there is no water flow from the outlet side of the valve
- 182 **2.3.107**
183 **travel**
184 displacement of the closure member from the closed position
- 185 **2.3.108**
186 **rated travel**
187 displacement of the closure member from the closed position to the full open position
- 188 **2.3.109**
189 **open position**
190 position of the closure member when there is a flow of water from the outlet side of the valve
- 191 **2.3.110**
192 **fully open position**
193 position of the closure member so that the amount of water flowing through the valve is in accordance
194 with the rated flow rate
- 195 **2.3.111**
196 **flow rate**
197 volume of water flowing through the valve in unit time
- 198 **2.3.112**
199 **rated flow rate**
200 flow rate at the rated travel under standard reference conditions of temperature and pressure declared
201 at a given pressure difference
- 202 **2.3.113**
203 **flow factor**
204 factor specifying the amount of water which can pass through the valve at a specified pressure
205 difference
- 206 Note 1 to entry: The flow factor may be referred to as flow coefficient.
207 Note 2 to entry: The relationship between the different flow factors in use is indicated in annex AA.

- 208 **2.3.114**
209 **maximum operating pressure differential**
210 declared maximum difference in pressure between inlet and outlet ports of the valve against which the
211 actuator can operate the closure member
- 212 **2.3.115**
213 **minimum operating pressure differential**
214 declared minimum pressure difference at which the valve opens or closes
- 215 **2.3.116**
216 Void
- 217 **2.3.117**
218 **water hammer**
219 excessive transient pressure which can occur in some water supply systems as a result of closing a
220 valve as intended
- 221 **2.3.118**
222 **transient pressure**
223 short-time pressure surge exceeding the normal stable supply pressure in the closed condition of the
224 valve
- 225 **2.3.119**
226 **valve with anti-water-hammer characteristics**
227 valve that does not cause an excessive pressure drop when opening and no excessive transient
228 pressure when closing if connected directly, without special precautions to water supply mains
229 applications where water-hammer may occur
- 230 **2.13 Miscellaneous definitions**
- 231 *Additional definitions:*
- 232 **2.13.101** Void
- 233 **2.13.102** Void
- 234 **2.13.103**
235 **water for tap and shower outlets**
236 water intended to supply a bath, shower, bidet, wash basin, kitchen sink, or other such taps that
237 discharge in to a drainage system
- 238 **3 General requirements**
- 239 This clause of part 1 is applicable.
- 240 **4 General notes on tests**
- 241 This clause of part 1 is applicable, except as follows:
- 242 **4.1 Conditions of test**
- 243 **4.1.2 Addition:**
- 244 *Unless otherwise specified in this standard, water temperature for the tests shall be maintained at a*
245 *temperature of (20 ± 5) °C.*
- 246 **4.2 Samples required**
- 247 **4.2.1 Addition:**
- 248 *One sample is required for each test of clause 27.*

249 NOTE By agreement between manufacturer and testing authority, one sample may be submitted to more than one test.

250 **5 Rating**

251 This clause of part 1 is applicable.

252 **6 Classification**

253 This clause of part 1 is applicable, except as follows:

254 **6.3.12** – electrically operated valve

255 *Addition:*

256 **6.3.12.101** – water valve

257 **6.5.2** According to degree of protection provided by enclosures against harmful ingress of water (see
258 IEC 60529)

259 *Replacement of the second explanatory paragraph as follows:*

260 NOTE 2 Preferred degrees of protection provided by enclosures are:

261 IP20, IP30, IP40, IP54, IP65.

262 Values differing from these preferred values are allowed.

263 **6.7 According to ambient temperature limits of the switch head:**

264 *Modification:*

265 Read "valve" for "control" and "actuator" for "switch head".

266 **6.8 According to protection against electric shock:**

267 **6.8.3** *Replacement:*

268 For an independently mounted valve or a valve integrated or incorporated in an assembly utilizing a
269 non-electrical source:

270 **6.10** Not applicable.

271 **6.11** *Addition:*

272 Water valves shall be subjected to a minimum of 6 000 automatic cycles.

273 *Additional subclauses:*

274 **6.101 According to type of end-connections**

275 **6.101.1** Valves provided with internally threaded end-connections with either:

276 ISO 7-1 or NPT thread when pressure-tight joints are made on the thread, or

277 ISO 228-1 thread when pressure-tight joints are not made on the thread, but via an additional sealing
278 washer.

279 **6.101.2** Valves provided with externally threaded end-connections for:

280 a) compression fittings, or

281 b) washered union connection, or

- 282 c) cone seated union connection, or
283 d) threaded pipe connections either according to ISO 7-1, ISO 228-1 or NPT thread.
- 284 **6.101.3** Valves provided with flanged end-connections suitable for connection to flanges with or
285 without adaptors.
- 286 **6.101.4** Valves provided with end-connections with neck-end for soldered or welded connections.
- 287 **6.101.5** Valves provided with end-connections with hose tails for use with flexible tubing.
- 288 **6.102 According to features of electrically operated water valves**
- 289 **6.102.1** According to the size and capacity:
290 Size and capacity to be specified in dimension of inlet and outlet connections and flow factor.
- 291 **6.102.2** According to the type of operation:
292 Direct or pilot controlled with or without minimum pressure differential limit.
- 293 **6.102.3** According to function:
294 Description of function regarding the number of water connections and the valve position when de-
295 energized.
- 296 **6.102.4** According to material of wetted parts:
297 Includes the material identification of all internal parts in contact with water such as the body and the
298 sealing material.
- 299 **6.102.5** According to construction of the closure member:
300 The valve may be a direct operated or pilot valve controlled diaphragm or piston-operated poppet type
301 or spool type closing member.
- 302 **6.102.6** According to construction of the actuator:
303 Examples are: electromagnetic; electric motor; electrically heated wax or bi-metal controlled actuator
304 with actuator stem in contact with or shielded from the water.
- 305 **6.103 According to temperature, pressure and type of the water controlled**
- 306 Valves for controlling:
- 307 **6.103.1** Cold water supply with a maximum temperature of 25 °C;
308 **6.103.2** Hot water supply with a maximum temperature of 90 °C;
309 **6.103.3** Void
310 **6.103.4** Void
311 **6.103.5** Circulation heating water with a maximum temperature of between 50 °C and 120 °C;
312 **6.103.6** Water with a maximum rated temperature other than indicated above;
313 **6.103.7** Water flow in systems with a maximum pressure of 0,1 MPa;
314 **6.103.8** Water flow in systems with a maximum pressure of 0,6 MPa;