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

Interested committees:

Title: BS EN IEC 60730-2-8 Automatic electrical controls

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

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

- 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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THIS DRAFT IS NOT CURRENT BEYOND 8 May 2024**

This draft is issued to allow comments from interested parties; all comments will be given consideration prior to publication. No acknowledgement will normally be sent. **See overleaf for information on the submission of comments.**

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Responsible Committee Secretary: **Mr Simon Bounds (BSI)**Direct tel: **0208 996 7281**E-mail: simon.bounds@bsigroup.com

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

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	Commend (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.	



72/1411/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 60730-2-8 ED4	
DATE OF CIRCULATION: 2024-03-15	CLOSING DATE FOR VOTING: 2024-06-07
SUPERSEDES DOCUMENTS: 72/1398/RR	

IEC TC 72 : AUTOMATIC ELECTRICAL CONTROLS	
SECRETARIAT: United States of America	SECRETARY: Ms Grace Roh
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	☒ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE: Automatic electrical controls - Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements
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PROPOSED STABILITY DATE: 2028

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

AUTOMATIC ELECTRICAL CONTROLS –

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

FOREWORD

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IEC 60730-2-8 has been prepared by IEC technical committee 72: automatic electrical controls. It is an International Standard.

This fourth edition of IEC 60730-2-8 cancels and replaces the third edition IEC 60730-2-8:2018 and Amendment 1:2021. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

adoption to IEC 60730-1:2022 with all its significant changes to IEC 60730-1:2013, Amendment 1:2015 and Amendment 2:2020.

159 The text of this International Standard is based on the following documents:

Draft	Report on voting
XX/XX/FDIS	XX/XX/RVD

160
161 Full information on the voting for its approval can be found in the report on voting indicated in
162 the above table.

163 The language used for the development of this International Standard is English.

164 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in
165 accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available
166 at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are
167 described in greater detail at www.iec.ch/publications.

168 A list of all parts of the IEC 60730 series, under the general title: automatic electrical control, can
169 be found on the IEC website.

170 This part 2-8 is intended to be used in conjunction with IEC 60730-1:2022. Consideration may
171 be given to future editions of, or amendments to, IEC 60730-1.

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

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

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

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

181 The reader's attention is drawn to the fact that Annex Q to Annex T list all of the "in-some-
182 country" clauses on differing practices of a less permanent nature relating to the subject of this
183 document.

184 In this publication:

185 1) The following print types are used:

- 186 – requirements proper: in roman type;
- 187 – *test specifications: in italic type*;
- 188 – explanatory matter: in smaller roman type.
- 189 – Defined terms: **bold type**.

190 2) Subclauses, notes or items which are additional to those in Part 1 are numbered starting
191 from 101, additional annexes are lettered AA, BB, etc.

192

193
194

195 The committee has decided that the contents of this document will remain unchanged until the
196 stability date indicated on the IEC website under webstore.iec.ch in the data related to the
197 specific document. At this date, the document will be

- 198 • reconfirmed,
199 • withdrawn,
200 • replaced by a revised edition, or
201 • amended.

202

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

203

204

AUTOMATIC ELECTRICAL CONTROLS –

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

1 Scope

Replacement:

This document applies to **electrically operated water valves**

- for use in, on, or in association with equipment for household appliance and similar use;

NOTE 1 Throughout this document, the word "equipment" means "appliance and equipment" and "control" means "electrically operated water valve".

EXAMPLE 1 **Electrically operated water valves** for appliances within the scope of IEC 60335.

- for building automation within the scope of ISO 16484 series and IEC 63044 series (HBES/BACS);

EXAMPLE 1 Independently mounted **water valves**, controls in smart grid systems and controls for building automation systems within the scope of ISO 16484-2.

- for equipment that is used by the public, such as equipment intended to be used in shops, offices, hospitals, farms and commercial and industrial applications;

EXAMPLE 2 **Electrically operated water valves** for commercial catering, heating and air-conditioning equipment.

- that are **smart enabled electrically operated water valves**;

EXAMPLE 3 Smart grid control, remote interfaces/control of energy-consuming equipment including computer or smart phone.

- that are AC or DC powered **electrically operated water valves** with a rated voltage not exceeding 690 V AC or 600 V DC;
- used in, on, or in association with equipment that use electricity, gas, oil, solid fuel, solar thermal energy, etc., or a combination thereof;
- utilized as part of a **control system** or **controls** which are mechanically integral with **multifunctional controls** having non-electrical outputs;
- using NTC or **PTC thermistors** and to discrete **thermistors**, requirements for which are contained in Annex J;
- that responsive to or controlling such characteristics as temperature, pressure, passage of time, humidity, light, electrostatic effects, flow, or liquid level, current, voltage, acceleration, or combinations thereof;
- **actuators** and to **valve** bodies which are designed to be fitted to each other.
- as well as manual controls when such are electrically and/or mechanically integral with automatic controls.

NOTE 2 Requirements for manually actuated mechanical switches not forming part of an automatic control are contained in IEC 61058-1-1.

This document applies to

- the inherent safety of **electrically operated water valves**, and
- functional safety of **electrically operated water valves** and safety related systems,
- controls where the performance (for example the effect of EMC phenomena) of the product can impair the overall safety and performance of the controlled system,

250 – the operating values, operating times, and operating sequences where such are associated
251 with equipment safety.

252 This document specifies the requirements for construction, operation and testing of **electrically**
253 **operated water valves** used in, on, or in association with an equipment.

254 This document contains requirements for electrical features of **water valves** and requirements
255 for mechanical features of **valves** that affect their intended operation.

256 This document does not

- 257 • apply to **electrically operated water valves** intended exclusively for industrial process
258 applications unless explicitly mentioned in the relevant part 2 or the equipment standard.
259 However, this document can be applied to evaluate automatic electrical controls intended
260 specifically for industrial applications in cases where no relevant safety standard exists.
- 261 • apply to
 - 262 – **electrically operated water valves** of nominal connection size above DN 50;
 - 263 – **electrically operated water valves** for admissible **nominal pressure rating** above
264 1,6 MPa;
 - 265 – food dispensers;
 - 266 – detergent dispensers;
 - 267 – steam valves;
- 268 • take into account the **response value** of an **automatic action** of a **electrically operated**
269 **water valve**, if such a **response value** is dependent upon the method of mounting the
270 control in the equipment. Where a **response value** is of significant purpose for the
271 protection of the **user**, or surroundings, the value defined in the appropriate equipment
272 standard or as determined by the manufacturer will apply.
- 273 • address the integrity of the output signal to the network devices, such as interoperability
274 with other devices unless it has been evaluated as part of the control system.
- 275 • cover the prevention of contamination of drinking water as a result of contact with materials.

276 Throughout this document, where it can be used unambiguously, the term:

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

282 2 Normative references

283 This clause of Part 1 is applicable except as follows:

284 *Addition:*

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

287 ISO 65:1981, *Carbon steel tubes suitable for screwing in accordance with ISO 7-1*

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

290 ISO 630-2:2011, *Structural steels – Part 2: Technical delivery conditions for structural steels*
291 *for general purposes*

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

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

295 **3 Terms and definitions**

296 This clause of Part 1 is applicable except as follows:

297 **3.2 Definitions of types of control according to purpose**

298 **3.2.13**

299 **electrically operated valve**

300 *Addition:*

301 Note 101 to entry: A semi-automatic **valve** that is opened manually and closes automatically or vice versa is also
302 covered by this definition.

303 *Add the following definitions:*

304 **3.2.13.101**

305 **valve**

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

308 **3.2.13.102**

309 **water valve**

310 **valve** intended to be connected to a water supply and to control water flow

311 **3.2.13.103**

312 **heating-water valve**

313 **valve** intended to control the water circulation in heating systems

314 **3.2.13.104**

315 **actuator**

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

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

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

321 **3.2.13.105**

322 **valve body assembly**

323 assembly comprising the **valve body**, inlet and outlet **end connections**, the **valve seat**,
324 **closure member** and **stem** or shaft

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

326 **3.2.13.106**

327 **valve body**

328 part of the **valve body assembly** which is the main pressure boundary

329 Note 1 to entry: It provides the water flow passage-ways with **end connections**.

330 **3.2.13.107**

331 **nominal size**

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

- 334 Note 1 to entry: It may be designated by "DN" followed by a convenient round number, for reference purposes only.
- 335 Note 2 to entry: Some older international standards refer to **nominal size** as nominal diameter but, for the purpose
- 336 of this document, the two terms are synonymous.
- 337 **3.2.13.108**
- 338 **nominal pressure rating**
- 339 numerical designation of pressure rating
- 340 Note 1 to entry: It may be designated by the letters "PN" (also referred to as the pressure number) followed by a
- 341 convenient round number, for reference purposes only.
- 342 **3.2.13.109**
- 343 **end connection (end-connection)**
- 344 **valve body** configuration provided to make a pressure-tight joint to the fluid-conducting system
- 345 **3.2.13.110**
- 346 **valve seat**
- 347 surface of the orifice within the **valve** which makes full contact with the **closure member**
- 348 **3.2.13.111**
- 349 **closure member**
- 350 movable part of the **valve** which is positioned in the flow path to modify the rate of flow through
- 351 the **valve**
- 352 Note 1 to entry: A **closure member** may be a plug, ball, disc, vane, gate, etc.
- 353 **3.2.13.112**
- 354 **stem**
- 355 component which connects the actuator to, and positions, the **closure member**
- 356 Note 1 to entry: For rotary **valves**, the word "shaft" should be used in place of "**stem**".
- 357 Note 2 to entry: In some controls, the **stem** may be part of the actuator.
- 358 **3.2.13.113**
- 359 **fitting**
- 360 any device such as a reducer, expander, elbow, or T-piece which is attached directly to an end-
- 361 connection of the **valve body assembly**
- 362 **3.3 Definitions relating to the function of controls**
- 363 *Add the following definitions:*
- 364 **3.3.101**
- 365 **on-off valve**
- 366 **valve** which is open or closed, without any intermediate positions
- 367 **3.3.102**
- 368 **normally closed valve**
- 369 **valve** which is closed when not electrically energized
- 370 **3.3.103**
- 371 **normally open valve**
- 372 **valve** which is open when not electrically energized
- 373 **3.3.104**
- 374 **modulating valve**
- 375 **valve** which has a variable **flow rate** between predetermined flow limits

- 376 **3.3.105**
377 **diverting valve**
378 **valve** with one or more inputs and outputs which may permit flow from any combination of inputs
379 to outputs
- 380 **3.3.106**
381 **closed position**
382 position of the **closure member** when there is no water flow from the outlet side of the **valve**
- 383 **3.3.107**
384 **travel**
385 displacement of the **closure member** from the **closed position**
- 386 **3.3.108**
387 **rated travel**
388 displacement of the **closure member** from the **closed position** to the **full open position**
- 389 **3.3.109**
390 **open position**
391 position of the **closure member** when there is a flow of water from the outlet side of the **valve**
- 392 **3.3.110**
393 **full(y) open position**
394 position of the **closure member** so that the amount of water flowing through the **valve** is in
395 accordance with the **rated flow rate**
- 396 **3.3.111**
397 **flow rate**
398 volume of water flowing through the **valve** in unit time
- 399 **3.3.112**
400 **rated flow rate**
401 **flow rate** at the **rated travel** under standard reference conditions of temperature and pressure
402 declared at a given pressure difference
- 403 **3.3.113**
404 **flow factor**
405 factor specifying the amount of water which can pass through the **valve** at a specified pressure
406 difference
- 407 Note 1 to entry: The **flow factor** may be referred to as flow coefficient.
- 408 Note 2 to entry: The relationship between the different **flow factors** in use is indicated in Annex AA.
- 409 **3.3.114**
410 **maximum operating pressure differential**
411 declared maximum difference in pressure between inlet and outlet ports of the **valve** against
412 which the actuator can operate the **closure member**
- 413 **3.3.115**
414 **minimum operating pressure differential**
415 declared minimum pressure difference at which the **valve** opens or closes
- 416 **3.3.116**
417 **water hammer**
418 excessive **transient pressure** which can occur in some water supply systems as a result of
419 closing a **valve** as intended

3.3.117**transient pressure**

short-time pressure surge exceeding the normal stable supply pressure in the closed condition of the **valve**

3.3.118**valve with anti-water-hammer characteristics**

valve that does not cause an excessive pressure drop when opening and no excessive **transient pressure** when closing if connected directly, without special precautions to water supply mains applications where water-hammer may occur

3.13 Miscellaneous definitions

Add the following definitions

3.13.101**water for tap and shower outlets**

water intended to supply a bath, shower, bidet, wash basin, kitchen sink, or other such taps that discharge in to a drainage system

4 General

This clause of Part 1 is applicable except as follows:

4.3 General notes on tests**4.3.2 Conditions of test****4.3.2.2 Addition:**

Unless otherwise specified in this document, water temperature for the tests shall be maintained at a temperature of $(20 \pm 5) ^\circ\text{C}$.

5 Required technical information

This clause of Part 1 is applicable except as follows:

5.2 Methods of providing technical information

This clause of Part 1 is applicable except as follows:

Table 1 – Required technical information and methods of providing these information

	Information	Clause or subclause	Method
<i>Modifications:</i>			
6	Purpose of control NOTE electrically operated water valves can be declared as water valve, heating-water valve	3.2, 4.3.4.2, 4.3.4.5, 19.15	D or E
8	The type of load controlled by each circuit (for valves with switching devices) ^b such as substantially resistive, resistive or inductive, declared specific load, 20 mA load, declared motor load and pilot duty load	16, 19, Table 18, Table 19, Table 20, 23.2.2, 26.2.3,	C
15	Temperature limits of the electrically operated water valve , if the minimum value ($T_{\min}$) lower than $0 ^\circ\text{C}$ or the maximum value ($T_{\max}$) other than $55 ^\circ\text{C}$	16.5, 16.7, 19.3	D