

Subject 60730-2-8

February 3, 2017

SUMMARY OF TOPICS

The following changes in requirements to the Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Electrically Operated Water Valves, Including Mechanical Requirements, UL 60730-2-8, are being proposed:

1. ANSI approval of the proposed revisions to UL 60730-2-8 based on the second amendment to edition No. 2 of IEC 60730-2-8.

STP BALLOTS AND ALL COMMENTS DUE: April 4, 2017

UL's goal is to have no interest category comprise more than one-third of the STP membership balance. To improve the current balance for STP 60730B, UL is looking for participants in all interest categories except producers. Definitions for these interest categories are available on the Standards STP Internet site:

<http://ulstandards.ul.com/develop-standards/participation/interest-categories/>

If you are interested in applying for STP 60730B membership or are aware of potential candidates for this STP, please contact the STP Project Manager, alan.t.mcgrath@ul.com.

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~.

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CONTENTS

NATIONAL DIFFERENCES	6
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FOREWORD	7
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1 Scope and normative references	10
1.5 Normative references	11
2 Definitions	12
2.2 Definitions of types of control according to purpose	12
2.3 Definitions relating to the function of controls	14
2.13 Miscellaneous definitions	16
3 General requirements	16
4 General notes on tests	16
4.1 Conditions of test	16
4.2 Samples required	17
5 Rating	17
6 Classification	17
6.5.2 According to degree of protection provided by enclosures against harmful ingress of water (see IEC 60529)	17
6.7 According to ambient temperature limits of the switch head:	17
6.8 According to protection against electric shock:	18
6.101 According to type of end-connections	18
6.102 According to features of electrically operated water valves	19
6.103 According to temperature, pressure and type of the water controlled	20
6.104 According to nominal size and thread size of end connections	20
7 Information	21
7.4 Additional requirements for marking	23
8 Protection against electric shock	23
9 Provision for protective earthing	24
9.5.101DV.1 Swimming pool VALVE	24
10 Terminals and terminations	24
10.1 Terminals and terminations for external copper conductors	24
10.2 Terminals and terminations for internal conductors	25
11 Constructional requirements	25
11.3 <i>Modification:</i>	25
11.3.9 <i>Replacement:</i>	26
11.101 Separation of wetted parts from electrical parts	26
11.102DV.1 Springs	26
11.103DV.1 Metal parts	26
11.104DV.1 Threaded fasteners	27
12 Moisture and dust resistance	27
13 Electric strength and insulation resistance	27
14 Heating	27
15 Manufacturing deviation and drift	29
16 Environmental stress	29
16.2 Environmental stress of temperature	29
17 Endurance	29
17.7 Over-voltage (or in some countries, overload) test of automatic action at accelerated rate	30
17.16 Test for particular purpose controls	31
18 Mechanical strength	31

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18.101.1	Test at 1,5 times maximum rated working pressure (test for external leakage) . . .	31
18.101.2	Test at 5 times maximum rated working pressure (hydrostatic strength test) . . .	32
18.101.3	Anti-water hammer characteristics	32
18.101.3.1	Pressure drop at low supply pressure	32
18.101.3.2	Pressure drop at rated inlet pressure	33
18.101.3.3	Transient pressure at high pressure	33
18.101.4	Test on valve bodies of thermoplastic material	33
18.102	Wetted material specifications	34
18.102.1.1	Test for corrosion resistance of materials wetted by drinking-water	34
18.102.1.2	Test for corrosion resistance of materials wetted by non-drinking-water . . .	34
18.102.1.3	Tests for the effect on drinking-water quality by wetted materials	34
18.103	Torque	34
18.103.2	Valves with internal threaded end-connections	35
18.103.3	Valves with external threaded end-connections	35
18.103.4	Valves with end-connections for adaptors	35
19	Threaded parts and connections	35
20	Creepage distances, clearances and distances through insulation	36
21	Resistance to heat, fire and tracking	36
22	Resistance to corrosion	36
23	Electromagnetic compatibility (EMC) requirements – emission	36
24	Components	36
25	Normal operation	36
26	Electromagnetic compatibility (EMC) requirements – immunity	36
27	Abnormal operation	36
27.2	~~Blocked mechanism~~ <u>Burnout</u> test	36
27.2.3	Blocked mechanical output test (abnormal temperature test)	37
27.2.101	~~Blocked output test (temperature)~~ <u>Test on three phase valve</u>	38
27.3	Overvoltage and undervoltage test	39
27.101	Dry condition test	40
27.102	Running overload	40
28	Guidance on the use of electronic disconnection	41

Figures

Annexes

Annex H (normative) Requirements for electronic controls

H.6	Classification	42
H.6.18	According to software class	42
H.7	Information	42
H.11	Constructional requirements	42
H.11.12	Controls using software	42
H.26	Electromagnetic compatibility (EMC) requirements – immunity	42
H.26.5	Voltage dips and voltage interruptions in the power supply network	43
H.26.6	Not applicable.	43
H.26.8	Surge immunity test	43
H.26.8.3	Test procedure	43
H.26.9	<u>Electrical</u> fast transient/burst test	44
H.26.9.3	Test procedure	44
H.26.9.101	Test procedure	44
H.26.11	Electrostatic discharge test	45
H.26.11.101	Test procedure	45

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H.26.11.102 Compliance	45
H.26.12 Radio-frequency electromagnetic field immunity	45
H.26.13 <u>Evaluation of compliance</u> <u>Test of influence of supply frequency variations</u>	46
H.26.13.3 Test procedure	46
H.26.13.3.101 Compliance	47
H.26.14 Power frequency magnetic field immunity test	47
H.26.14.3 Test procedure	47

Annex AA (informative) Relation between different flow coefficients

AA.1 K_v value	48
AA.2 C_v value	48

Annex BB (normative) Arrangement for the measurement of transient pressures caused by water valves

Annex CC (normative) Test on valve bodies of thermoplastic material intended to be connected to the water supply mains

Annex DD (normative) Torque

DD.1 Torque test for valves with internally threaded end-connections to ISO 7-1	53
DD.1.1 General	53
DD.1.2 Torque test	53
DD.1.2.1 Torque test for two ports straight through of equal sizes of inlet and outlet (see figure DD.1a)	54
DD.1.2.2 Torque test for two ports straight through unequal size of inlet and outlet. .	55
DD.1.2.3 Torque test for two or more ports under an angle (not on the same axis) of inlets and outlets of equal or unequal size.	55
DD.2 Torque test for valves with internally threaded end-connections to ISO 228-1	55
DD.3 Torque test for valves with internally threaded end-connections with ISO metric thread for compression fittings	56
DD.3.1 Olive type compression fittings	56
DD.3.2 Flared compression fittings	56
DD.4 Torque test for valves with externally threaded end-connections to ISO 7-1	56
DD.5 Torque test for valves with external threaded end-connections to ISO 228-1 or to ISO metric thread for compression fittings	56
DD.6 Torque test for valves with adaptors	56
DD.7 Torque test for valves with internally or externally threaded end-connections for NPT thread .	57
DD.8 Torque test for valves with internally or externally threaded end-connections for SAE thread .	57

Annex EE (normative) Arrangement for the measurement of transient pressures caused by water valves with a declared pressure of up to and including 1,0 MPa (10 bar)

Annex 8.DVA – Manufacturing and Production Tests (normative)

1. ANSI approval of the proposed revisions to UL 60730-2-8 based on the second amendment to edition No. 2 of IEC 60730-2-8.

RATIONALE

Proposal submitted by: Kenneth McKinney, UL LLC

The IEC issued edition 2.2 of IEC 60730-2-8 in November 2015. The previous UL edition was based on edition 2.1 of IEC 60730-2-8. Therefore, UL is proposing to adopt the revisions contained in the second amendment to edition No. 2 of IEC 60730-2-8.

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The National Difference Page and IEC Foreword have been provided for your reference in reviewing this document. However, they are not considered to be part of the ANSI balloted material.

PROPOSAL

NATIONAL DIFFERENCES

GENERAL

National Differences from the text of International Electrotechnical Commission (IEC) Publication 60730-2-8, Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Electrically Operated Water Valves, Including Mechanical Requirements copyright 2003 are indicated by notations (differences) and are presented in bold text.

There are five types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

DR – These are National Differences based on the **national regulatory requirements**.

D1 – These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

D2 – These are national differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE – These are National Differences based on **editorial comments or corrections**.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

Addition / Add - An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base IEC text.

Modification / Modify - A modification is an altering of the existing base IEC text such as the addition, replacement or deletion of certain words or the replacement of an entire clause, subclause, table, figure, or annex of the base IEC text.

Deletion / Delete - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

AUTOMATIC ELECTRICAL CONTROLS FOR HOUSEHOLD AND SIMILAR USE – Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements

FOREWORD

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This Consolidated version of IEC 60730-2-8 bears the edition number 2.2. It consists of the second edition (2000-02) [documents 72/428/FDIS and 72/439/RVD], its amendment 1 (2002-11) [documents 72/553/FDIS and 72/557/RVD] and its amendment 2 (2015-11) [documents 72/1011A/FDIS and 72/1025/RVD]. The technical content is identical to the base edition and its amendments.

This Final version does not show where the technical content is modified by amendments 1 and 2. A separate Redline version with all changes highlighted is available in this publication.

International Standard IEC 60730-2-8 has been prepared by IEC technical committee 72: Automatic controls for household use.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

This part 2-8 is intended to be used in conjunction with IEC 60730-1. It was established on the basis of the ~~second~~ fourth edition (1993-2010) of that publication ~~and its amendments 1 (1994) and 2 (1997)~~. 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.

~~In this part 2-8,~~ The "in some countries" notes regarding differing national practices are contained in the following ~~subclauses~~ elements:

- Table ~~7-2-1~~, items 113 and 114
- 14.7.4, note 101
- 16.2.1
- ~~27.2-101~~ 27.2.3.1
- ~~27-101~~
- H.26.2.1
- annex CC
- table DD.1.2.1, note 1
- table DD.6, note 1

In this publication:

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1) The following print types are used:

- Requirements proper: in roman type.
- *Test specifications: in italic type.*
- Notes: in smaller roman 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.

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.

101DV DE *Modification of the fourth paragraph following item (6) of the Foreword:*

Due to formatting differences, marginal lines are not being used to identify where the base publication has been modified by amendment 1.

102DV DE *Modification of the print types used in the part 2:*

- Words in SMALL ROMAN CAPITALS in the text are defined in clause 2.

103DV DE *Addition to the part 2:*

The numbering system in the standard uses a space instead of a comma to indicate thousands and uses a comma instead of a period to indicate a decimal point. For example, 1 000 means 1,000 and 1,01 means 1.01.

AUTOMATIC ELECTRICAL CONTROLS FOR HOUSEHOLD AND SIMILAR USE – Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements

1 Scope and normative references

This clause of part 1 is replaced applicable as follows:

Replacement:

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 ~~that may use electricity, gas, oil, solid fuel, solar thermal energy, etc. or a combination thereof~~, including heating, air-conditioning and similar applications. The equipment may use electricity, gas, oil, solid fuel, solar thermal energy, etc., or a combination thereof.

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

1.1DV D2 Modification of 1.1 of the part 2 by adding the following:

These requirements do not cover VALVES for marine use.

~~1.1.1 This part 2-8 contains requirements for electrical features of water valves and requirements for mechanical features of valves that affect their intended operation.~~

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, on or in association with, household and 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.

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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”.

1.1.2DV DE Modification of 1.1.2 of the part 2:

In the third paragraph, replace the word “designed” with “intended”.

1.1.3 This part 2-8 also applies to actuators and to valve bodies which are designed to be fitted to each other.

1.1.4 This part 2-8 applies to individual valves, valves utilized as part of a system and valves mechanically integral with multi-functional controls having non-electrical outputs.

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

1.5 Normative references

This clause of part 1 is applicable except as follows:

Addition:

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

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

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

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

ISO 228-1:1994, *Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances and designation*

ISO 630:1995, *Structural steels – Plates, wide flats, bars sections and profiles*

ISO 1179:1981, *Pipe connections threaded to ISO 228-1 for plain end steel and other metal tubes in industrial applications*

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*

ISO 4144:1979, *Pipework – Stainless steel fittings threaded to in accordance with ISO 7-1*

ISO 4400:1994, *Fluid power systems and components – Three-pin electrical plug connectors with earth contact – Characteristics and requirements*

ISO 6952:1994, *Fluid power systems and components – Two-pin electrical plug connectors with earth contact – Characteristics and requirements*

2 Definitions

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

2.2 Definitions of types of control according to purpose

2.2.17

electrically operated valve

Addition:

NOTE A semi-automatic valve that is opened manually and closes automatically or vice versa is also covered by this definition.

Additional definitions:

2.2.17.101

valve

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

2.2.17.102

water valve

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

NOTE A water valve is a type 1 action. Switching devices incorporated in water valves are type 1 or 2 actions.

2.2.17.103

heating-water valve

valve intended to control the water circulation in heating systems

2.2.17.104

actuator

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

NOTE 1 An actuator may be integral with the valve, fixed to the valve body assembly or delivered as a separate component.

NOTE 2 An actuator may also include the valve and closure member.

2.2.17.105

valve body assembly

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

NOTE 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 It may be designated by "DN" followed by a convenient round number, for reference purposes only.

NOTE 2 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 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 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 For rotary valves the word "shaft" should be used in place of "stem".

NOTE 2 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

2.2.17.114DV D2 Addition to the UL part 2:

SAFETY VALVE:

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A normally closed valve intended to be actuated by a safety control or by an emergency device to prevent the delivery of a fluid that can result in risk of fire.

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

2.3.102

normally closed valve

valve which is closed when not electrically energized

2.3.103

normally open valve

valve which is open when not electrically energized

2.3.104

modulating valve

valve which has a variable flow rate between predetermined flow limits

2.3.105

diverting valve

valve with one or more inputs and outputs which may permit flow from any combination of inputs to outputs

2.3.106

closed position

position of the closure member when there is no water flow from the outlet side of the valve

2.3.107

travel

displacement of the closure member from the closed position

2.3.108

rated travel

displacement of the closure member from the closed position to the full open position

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2.3.109

open position

position of the closure member when there is a flow of water from the outlet side of the valve

2.3.110

fully open position

position of the closure member so that the amount of water flowing through the valve is in accordance with the rated flow rate

2.3.111

flow rate

volume of water flowing through the valve in unit time

2.3.112

rated flow rate

flow rate at the rated travel under standard reference conditions of temperature and pressure declared at a given pressure difference

2.3.113

flow factor

factor specifying the amount of water which can pass through the valve at a specified pressure difference

NOTE 1 The flow factor may be referred to as flow coefficient.

NOTE 2 The relationship between the different flow factors in use is indicated in annex AA.

2.3.114

maximum operating pressure differential

declared maximum difference in pressure between inlet and outlet ports of the valve against which the actuator can operate the closure member

2.3.115

minimum operating pressure differential

declared minimum pressure difference at which the valve opens or closes

2.3.116

Void

2.3.117

water hammer

excessive transient pressure which can occur in some water supply systems as a result of closing a valve as intended

2.3.118

transient pressure

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

2.3.119

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

2.13 Miscellaneous definitions

Additional definitions:

2.13.101

drinking-water

water supply which is intended to be suitable for human consumption

NOTE In some standards, "drinking-water" is referred to as "potable water".

2.13.102

non-drinking-water

water supply which is not intended for human consumption

3 General requirements

This clause of part 1 is applicable.

4 General notes on tests

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

4.1 Conditions of test**4.1.2 Addition:**

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

4.2 Samples required

4.2.1 Addition:

One sample is required for each test of clause 27.

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

5 Rating

This clause of part 1 is applicable.

6 Classification

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

6.3.12 — ELECTRICALLY OPERATED VALVE

Addition:

6.3.12.101 — WATER VALVE

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

Replacement of the second explanatory paragraph as follows:

NOTE Preferred degrees of protection provided by enclosures are:

IP20, IP30, IP40, IP54, IP65.

Values differing from these preferred values are allowed.

6.7 According to ambient temperature limits of the switch head:

Modification:

Read “valve” for “control” and “actuator” for “switch head”.

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6.8 According to protection against electric shock:**6.8.3 Replacement:**

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

Additional subclauses:

~~6.8.101 For a single ACTUATOR:~~

~~6.8.101.1 — of class 0;~~

~~6.8.101.2 — of class 0I;~~

~~6.8.101.3 — of class I;~~

~~6.8.101.4 — of class II;~~

~~6.8.101.5 — of class III.~~

6.10 Not applicable.

6.11 Addition:

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

6.12DV D2 Deletion of 6.12 of the part 1:

This clause is not applicable.

6.16DV D2 Deletion of 6.16 of the part 1:

This clause is not applicable.

*Additional subclauses:***6.101 According to type of end-connections**

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

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

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

6.101.2 Valves provided with externally threaded end-connections for:

- a) compression fittings, or
- b) washered union connection, or
- c) cone seated union connection, or
- d) threaded pipe connections either according to ISO 7-1, ISO 228-1 or NPT thread.

6.101.3 Valves provided with flanged end-connections suitable for connection to flanges with or without adaptors.

6.101.4 Valves provided with end-connections with neck-end for soldered or welded connections.

6.101.5 Valves provided with end-connections with hose tails for use with flexible tubing.

6.102 According to features of electrically operated water valves

6.102.1 *According to the size and capacity:*

Size and capacity to be specified in dimension of inlet and outlet connections and flow factor.

6.102.2 *According to the type of operation:*

Direct or pilot controlled with or without minimum pressure differential limit.

6.102.3 *According to function:*

Description of function regarding the number of water connections and the valve position when de-energized.

6.102.4 *According to material of wetted parts:*

Includes the material identification of all internal parts in contact with water such as the body and the sealing material.

6.102.5 *According to construction of the closure member:*

The valve may be a direct operated or pilot valve controlled diaphragm or piston-operated poppet type or spool type closing member.

6.102.6 *According to construction of the actuator:*

Examples are: electromagnetic; electric motor; electrically heated wax or bi-metal controlled actuator with actuator stem in contact with or shielded from the water.