This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

BSI Standards Publication

Automatic electrical controls

Part 1: General requirements

bsi.

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

National foreword

This British Standard is the UK implementation of EN 60730-1:2016+A1:2019. It is derived from IEC 60730-1:2013, incorporating corrigendum September 2014 and amendment 1:2015. It supersedes BS EN 60730-1:2016, which will be withdrawn on 12 April 2022.

CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags [C⟩ ⟨C].

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment A1 is indicated by [A1⟩ ⟨A1].

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by CENELEC corrigendum September 2014 is indicated in the text by [AC1⟩ ⟨AC1].

The UK participation in its preparation was entrusted to Technical Committee CPL/72, Electrical control devices for household equipment and appliances.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 580 88579 2

ICS 97.120; 33.160.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2016.

Amendments/corrigenda issued since publication

Date	Text affected
31 May 2019	Addition of CENELEC endorsement pages

EUROPEAN STANDARD EN 60730-1:2016/A1

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

EUROPÄISCHE NORM

April 2019

ICS 97.120

English Version

Automatic electrical controls - Part 1: General requirements

Dispositifs de commande électrique automatiques - Partie 1: Exigences générales

Automatische elektrische Regel- und Steuergeräte - Teil 1: Allgemeine Anforderungen

This European Standard was approved by CENELEC on 2016-03-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2019 CENELEC All rights of exploitation in any form and by any means reserved worldwide for CENELEC Members.

Ref. No. EN 60730-1:2016/A1:2019 E

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

This document (EN 60730-1:2016*)* consists of the text of IEC 60730-1:2013 + corrigendum 1:2014 prepared by IEC/TC 72 "Automatic electrical controls", together with the common modifications prepared by CLC/TC 72 "Automatic controls for household use*"*.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2017-01-29
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	- *

** Justification for no dow:*
This European Standard supersedes EN 60730-1:2011. However, EN 60730-1:2011 remains valid until all the Part 2's which are used in conjunction with it have been withdrawn. No date of withdrawal (dow) has been given pending the updating of all the Part 2's to align with this EN 60730-1:2016. The applicable date of withdrawal is given in each Part 2. It is intended the dow for this Part 1 will be fixed once all the Part 2's have been updated.

This document supersedes EN 60730-1:2011.

EN 60730-1:2016 includes the following significant technical changes with respect to EN 60730-1:2011:

– changes of the title of the Standard into "*Automatic electrical controls – Part 1: General requirements*";
– revisions to Clause H.26 based on changes in technology, applications, and to improve consistency and layout;
– modification to Table H.12 to align with CISPR 22;
– revisions to Annex J to correlate the fault modes of thermistors, and to exempt thermistors used in conjunction with type 1 controls in SELV low power circuits from the tests specified in Annex J;
– new requirements covering battery-powered controls, and the use of batteries in controls;
– revision addressing the relay faults in Table H.24;
– new/updated requirements in Clause 24, for switch mode power supplies;
– revisions covering the allowance of screwless-type clamping units complying with IEC 60999-1;
– new requirements addressing remotely actuated control functions;
– addition of a new/updated leakage current diagram to align the Annex E diagram with the diagram in IEC 60990;
– updated requirements for temperature sensing controls.

This Part 1 is to be used in conjunction with the appropriate Part 2 for a particular type of control, or for controls for particular applications. This Part 1 may also be applied, so far as reasonable, to controls not mentioned in a Part 2, and to controls designed on new principles, in which case additional requirements may be considered to be necessary.

Where, for a particular clause or subclause, the text of Part 2 indicates:

Addition: the Part 1 text applies with the additional requirement indicated in a Part 2;

Modification: the Part 1 text applies with a minor change as indicated in a Part 2;

Replacement: the Part 2 text contains a change which replaces the Part 1 text in its entirety.

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

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

NOTE In this standard the following print types are used:

– Requirements proper: in roman type.

– *Test specifications: in italic type.*

– Explanatory matter: in smaller roman type.

- Defined terms: **bold type**.

Some table titles contain reference in brackets to table numbers in IEC 60730-1:1999 (edition 3) for ease of correlation between Parts 2 and the Part 1.

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 60730-1:2013 are prefixed “Z”.

Special national conditions are listed in Annex ZB (normative) which forms part of this standard.

National deviations are listed in Annex ZC (informative).

Endorsement notice

The text of the International Standard IEC 60730-1:2013 was approved by CENELEC as a European Standard with agreed common modifications.

Foreword to amendment A1

The text of document 72/1017/FDIS, future IEC 60730-1:2013/A1, prepared by IEC/TC 72 "Automatic electrical controls" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60730-1:2016/A1:2019.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2019-10-12
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2022-04-12

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 60730-1:2013/A1:2015 was approved by CENELEC as a European Standard without any modification.

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 62151	-	Safety of equipment electrically connected to a telecommunication network	-	-
IEC 62368-1	-	Audio/video, information and communication technology equipment - Part 1: Safety requirements	EN 62368-1	-

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

Annex ZB
(normative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions.

NOTE If it affects harmonization, it forms part of the European Standard.

For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.

Clause	Special national condition
2.7.2	**Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom** Class 0 controls are not allowed.
2.7.3	**Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom** Class 01 controls are not allowed.
2.7.5.3	**Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom** Class 01 controls are not allowed.
4.3.3.1	**Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom** Class 0 and Class 01 controls are not allowed.
4.3.3.3	**Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom** Class 0 and Class 01 controls are not allowed.
6.8.2.1	**Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom** Class 0 controls are not allowed.
6.8.2.2	**Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom** Class 01 controls are not allowed.
6.8.3.1	**Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom** Class 0 controls are not allowed.
6.8.3.2	**Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom** Class 01 controls are not allowed.

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

7.4.3 **United Kingdom**

Add to the requirement:

Terminals intended exclusively for a live external conductor shall be indicated by the letter ‘L’.

7.4.3.2 **United Kingdom**

Add to the requirement:

The letter ‘L’ shall not be used except as indicated above.

9.1.1 **Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom**

Class 01 controls are not allowed.

9.1.2 **Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom**

Class 01 controls are not allowed.

11.9.4 **Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom**

Class 01 controls are not allowed.

Table 12 **Austria, Belgium, Denmark, France, Germany, Italy, Norway and United Kingdom**

Table footnote [d] Class 01 controls are not allowed.

16.2.1 **Finland, Norway and Sweden**

In the first dashed paragraph, replace "*(-10 ± 2) °C*" by "*(-25 ± 2) °C*".

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

Annex ZC
(informative)

A-deviations

A-deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN-CENELEC national member.

This European Standard falls under Directives LVD (2006/95/EC), RTTED (1999/5/EC) and EMC (2004/108/EC).

NOTE (from CEN/CENELEC IR Part 2:2011, 2.17) Where standards fall under EU Directives, it is the view of the Commission of the European Communities (OJ No C 59, 1982-03-09) that the effect of the decision of the Court of Justice in case 815/79 Cremonini/Vrankovich (European Court Reports 1980, p. 3583) is that compliance with A-deviations is no longer mandatory and that the free movement of products complying with such a standard should not be restricted except under the safeguard procedure provided for in the relevant Directive.

A-deviations in an EFTA-country are valid instead of the relevant provisions of the European Standard in that country until they have been removed.

Clause	Deviation
11.1.2	**Sweden** (Ordinance 1991:1290) Mercury is not allowed in switches and controls, such as level switches, thermostats and relays.
11.1.3	**United Kingdom** (Statutory Instrument 1768:1994) Add to the requirement: These regulations apply to all plugs for domestic use at a voltage of not less than 200 V and in general allow only plugs to BS 1363 to be fitted.

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

Annex ZD
(normative)

EMC immunity for controls

ZD.1 Electromagnetic compatibility (EMC) requirements – Immunity

The tests of Annex ZD apply to **operating controls** of **Type 1 action** intended to be used as "**free standing controls, independently mounted and/or in-line cord controls**" for EMC immunity instead of Clause H.26. See Figure ZD.1.

Annex ZD may be made applicable to incorporated and/or integrated controls if so requested by their manufacturer.

NOTE For EMC emission, Clause H.23 applies.

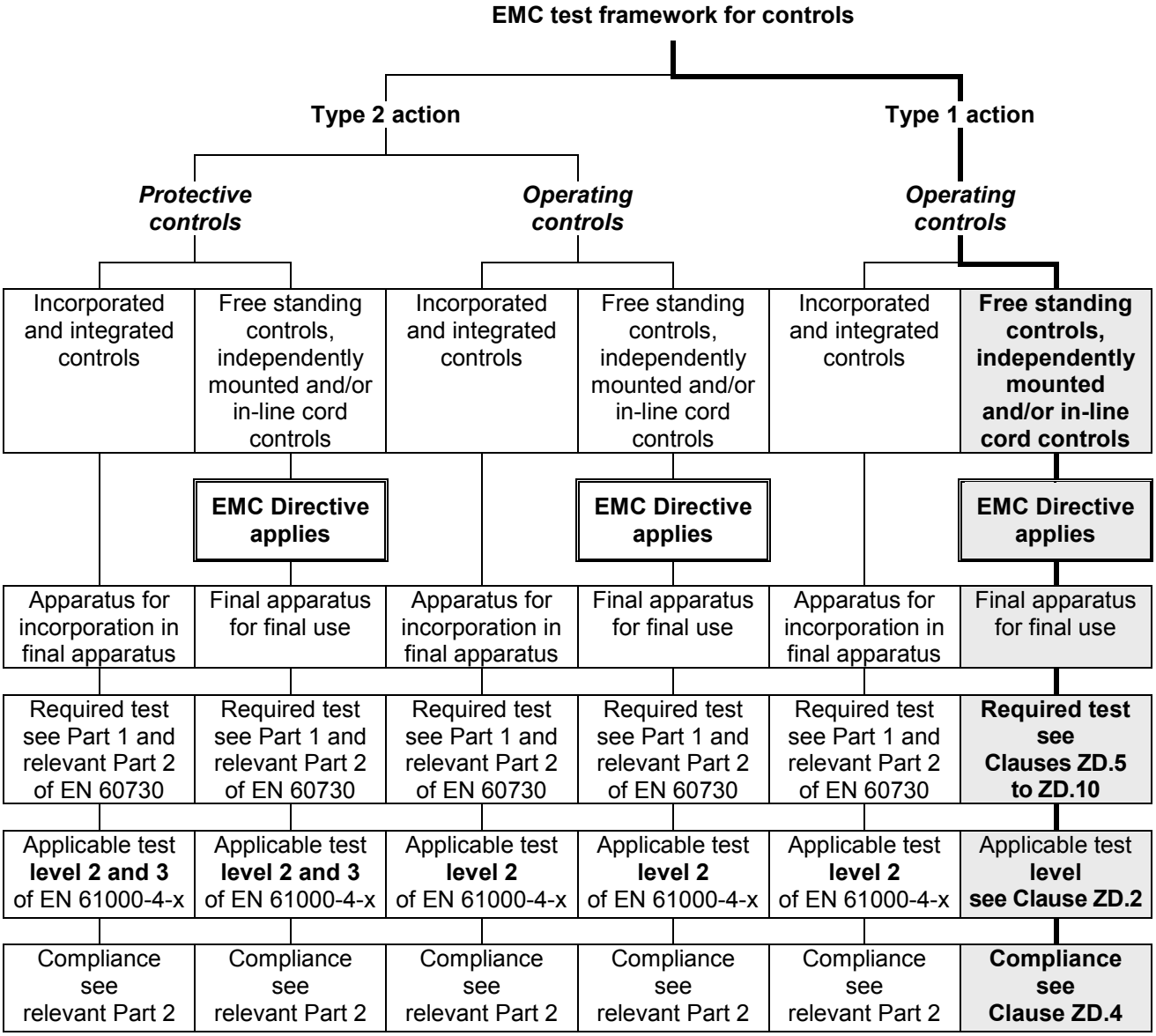

Figure ZD.1 – EMC test framework for controls

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

ZD.2 Classification of the control

Table ZD.1 – Classification and test overview

Control declaration	Installation and environmental condition									
	ESD		**Radiated EMF field**			**Burst**	**Surge**	**Conducted disturbance**	**Power magnetic field**	**Voltage dips & interruption**
	Environmental class EN 61000 -4-2		Environmental class EN 61000 -4-3 [d]			Environment class EN 61000 -4-4	Installation class [c] EN 61000 -4-5	Environment class EN 61000 -4-6	Environment class EN 61000 -4-8	Environment class EN 61000 -4-11
EMC level	Level 2	Level 3	Level 2	Level 2	Level 1	Level 2	Class 2	Level 2	Level 2	Class 2
Residential [a]	Contact dis-charge	Air dis-charge	< 1,0 GHz	1,4 GHz … 2,0 GHz	2,0 GHz … 2,7 GHz	Protected	Power and signal cables are well separated		Well protected	
EMC level	Level 2	Level 3	Level 3	Level 2	Level 1	Level 3	Class 3	Level 3	Level 4	Class 3
Industrial [b]	Contact dis-charge	Air dis-charge	< 1,0 GHz	1,4 GHz … 2,0 GHz	2,0 GHz … 2,7 GHz	Typical industrial	Power and signal cables run in parallel		Typical industrial	

[a] Residential: Controls are restricted for the use only in residential, commercial and light industrial environment (EN 61000-6-1).

[b] Industrial: In addition to residential, controls are also suitable for industrial environment (EN 61000-6-2).

[c] Installation classes: see Annex R.

[d] EN 61000-4-20 may be used for small EUT's as defined in EN 61000-4-20:2010, 6.1.

ZD.3 Information

Additional items to Table 1 (7.2 of the previous edition):

	Information	Clause or subclause	Method
Z3	According to the electromagnetic environment of one of the two EMC levels	ZD.2	X
Z4	EUT to be tested without primary protection, Table ZD.3, footnote [a]	ZD.5	X
Z5	Cable length up to or equal to 30 m, Table ZD.3, footnote [b]	ZD.5	X
Z6	Data line length < 10 m, Table ZD.3, footnote [c]	ZD.5	X
Z7	Test level (= protection level when upstream protection is not in place), Table ZD.3, footnote [d]	ZD.5	X
Z8	Data line length up to and including 3 m, Table ZD.5	ZD.5	X
Z9	Applicable of test and frequency, Table ZD.9	ZD.9	X

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

ZD.4 Evaluation of compliance

The compliance criteria are given in Table ZD.2 and are based on the operating conditions and the functional specification of the control during and after the test.

Number of test samples: minimum one sample

After the test, the control shall meet the requirements of Clause 8, 17.5 and Clause 20. If, as a result of the application of the tests defined in Annex ZD, the control becomes dangerous or unsafe, the control shall be deemed to have failed the test.

Table ZD.2 – Compliance criteria

Operating conditions	Compliance criteria		
	A	B	C
Digital inputs/outputs	No deviation on input readings No deviation on output settings (no change of state)	No deviation on input readings No deviation on output settings (no change of state)	Any error, such as a change of state, destruction of data, and loss of a connection is permitted, provided the initial state is restored automatically after the test - Automatic recovery after the test [b]
Analogue inputs/outputs	Deviation as declared in the final product specification is permitted [a].	Deviation is permitted during test.	
Display, Monitor	Operation shall be possible at reasonable comfort.	Deviation is permitted (e.g. display fault, such as flickering)	
Local operator override / switching	No deviation	Deviation is permitted for analogue values. No change of state for digital values	
Communication ports	No deviation detectable by the user The reduced data transfer rate shall be reasonable for the control operation.	Deviation is permitted. Loss of communication during the test Automatic recovery after the test	

[a] The permissible deviation is with respect to the value without electromagnetic interference. This means that any basic deviation is ignored.

[b] This compliance criterion is based on the fact that the control operation in the end user application will be unsupervised.

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

ZD.5 Surge immunity test

The control is mounted as specified in 4.1.1, supplied at rated voltage and operated at representative operating conditions. It is tested in accordance with EN 61000-4-5.

The severity levels for the declared installation class are specified in Table ZD.3.

Repetition rate: maximum 1/min

Polarity: positive (+) and negative (-)

Number of pulses: at least five pulses for each polarity are applied at selected points

Phase angle: 0°, 90°, 180° and 270° versus the phase angle of the AC line voltage to the equipment under test, with a tolerance of ± 10°

NOTE Most protectors in common use have low average power capabilities, even though their peak power or peak energy handling can deal with high currents. Therefore, the maximum repetition rate (the time between two surges and the recovery time) depends on the built-in protection devices of the EUT.

Table ZD.3 – Test levels for voltage surges

Control declaration	Test levels kV											
	AC power supply and AC I/O directly connected to mains network		**AC power supply and AC I/O not directly connected to mains network**		**DC power supply and DC I/O directly connected thereto**		**Unsymmetrical operated circuits/lines [c]**		**Symmetrical operated circuits/lines [c]**		**Shielded I/O and shielded communication lines**	
	Coupling mode		Coupling mode		Coupling mode		Coupling mode		Coupling mode		Coupling mode	
EMC Level	line to line	line to earth	line to line	line to earth	line to line	line to earth	line to line	line to earth	line to line	line to earth	line to line	line to earth
Residential	1	2,0	NA	NA	NA	NA	0,5	1,0	NA	1,0	NA	0,5
Industrial	1,0	2,0	1,0 [d]	2,0 [a,d]	0,5 [e]	0,5 [e]	1,0 [b]	2,0 [a,b]	NA	2,0 [a,b]	NA	2,0 [b]

[a] Normally tested with primary protection unless declared otherwise by the manufacturer (Clause ZD.3, requirement Z4).

[b] The test level shall be lowered to the next lower one if the cable length is shorter than or equal to 30 m (Clause ZD.3, requirement Z5).

[c] This test is not applicable to interconnection cables used as data lines and a length of up to 10 m (Clause ZD.3, requirement Z6).

[d] If protection is specified upstream from the EUT, the test level should correspond to the protection level when the protection is not in place (Clause ZD.3, requirement Z7).

[E] Not applicable to input ports intended for connection to a battery or a rechargeable battery that must be removed or disconnected from the apparatus for recharging. Apparatus with a DC power input port intended for use with an AC–DC power adaptor shall be tested on the AC power input of the AC–DC power adaptor specified by the manufacturer or, where none is so specified, using a typical AC–DC power adaptor. DC ports, which are not intended to be connected to a DC distribution network are treated as signal ports.

Compliance criteria: B (see Table ZD.2)

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

ZD.6 Electrical fast transient/burst immunity test

The control is mounted as specified in 4.1.1, supplied at rated voltage and operated at representative operating conditions. It is tested in accordance with EN 61000-4-4.

The severity levels for the declared EMC level are specified in Table ZD.4.

Polarity: positive (+) and negative (-)

Duration: one minute for each polarity

Table ZD.4 – Test levels for burst

Control declaration	Open circuit output test voltage and repetition rate of the impulses			
EMC level	On power port, PE		On I/O (input/output) signal, data and control ports	
	Voltage peak kV	Repetition rate kHz	Voltage peak kV	Repetition rate kHz
Residential	1	5	0,5	5
Industrial	2	5	1	5

Table ZD.5 – Test application for electrical fast transient burst test

AC power supply and control output for direct connection to the supply	DC power supply and control outputs for direct connection to the supply	Data lines [a]
Direct application via CDN according to EN 61000-4-4 between the reference ground plane and – each power supply line, individually – the nearest protective earth terminal – to all multiple combinations of power supply lines and also earth line	Capacitive clamp [b]	Capacitive clamp
[a] Applicable only to lines longer than 3 m, according to the manufacturer's declaration (Clause ZD.3, requirement Z8). [b] Not applicable to lines connected to dedicated non-rechargeable power supplies.		

Compliance criteria B: (see Table ZD.2)

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

ZD.7 Radio-frequency electromagnetic field immunity

ZD.7.1 Immunity to conducted disturbances

The control is mounted as specified in 4.1.1, supplied at rated voltage and operated at representative operating conditions. It is tested in accordance with EN 61000-4-6, the complete frequency range being swept at least once.

The severity levels for the declared EMC level are specified in Table ZD.6.

Table ZD.6 – Test levels for conducted disturbances on mains, I/O lines and DC power lines

Control declaration **EMC level**	**Frequency ranges: 150 kHz – 80 MHz**	
	Voltage level (EMF)	
	U_0 dBμV	U_0 V
Residential	130 [a c d]	3 [a c d]
Industrial	140 [a b c]	10 [a b c]

[a] The test level can also be defined as the equivalent current into a 150 Ω load.

[b] Except for the ITU broadcast frequency band 47 MHz to 68 MHz, where the level shall be 3 V.

[c] For I/O lines only applicable if the total cable length according to the manufacturer's functional specification may exceed 3 m.

[d] For input and output DC power port lines only applicable if the total cable length according to the manufacturer's functional specification may exceed 3 m.

Compliance criteria A: (see Table ZD.2)

ZD.7.2 Electrostatic discharge

The control is mounted as specified in 4.1.1, supplied at rated voltage and operated at representative operating conditions. It is tested in accordance with EN 61000-4-2.

The severity levels for the declared EMC level are specified in Table ZD.7.

Number of discharges for direct:	at least 5 discharges in each polarity (+/-)
Number of discharges for indirect horizontal: (Horizontal coupling plane)	at least 5 discharges in each polarity (+/-) for each position opposite the centre point of the horizontal coupling plane
Number of discharges for indirect vertical: (Vertical coupling plane)	at least 5 discharges in each polarity (+/-)

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

Table ZD.7 – Test levels for electrostatic discharge

Control declaration EMC level		Contact discharge Test voltage kV	Air discharge Test voltage kV
Residential and Industrial	Direct	4	8
	Indirect	4	Not applicable

Compliance criteria B: (see Table ZD.2)

ZD.8 Immunity to radiated electromagnetic fields

The control is mounted as specified in 4.1.1, supplied at rated voltage and operated at representative operating conditions. It is tested in accordance with EN 61000-4-3, the complete frequency range being swept at least once.

The severity levels for the declared EMC level are specified in Table ZD.8.

Table ZD.8 – Test levels for radiated electromagnetic field on enclosure

Control declaration EMC level	Frequency ranges		
	80 MHz to 1 GHz	1,4 GHz to 2 GHz	2,0 GHz to 2,7 GHz
	Field strength V/m	Field strength V/m	Field strength V/m
Residential	3	3 [a]	1 [a]
Industrial	10 [b]	3 [a]	1 [a]

[a] The frequency range has been selected to cover the frequencies with the highest potential risk of a disturbance.

[b] Except for the ITU broadcast frequency bands 87 MHz to 108 MHz, 174 MHz to 230 MHz, and 470 MHz to 790 MHz, where the level shall be 3 V/m.

Compliance criteria A: (see Table ZD.2)

ZD.9 Immunity to power-frequency magnetic fields

This test is only applicable to controls containing devices susceptible to magnetic fields. (e.g. hall-effect devices) and if declared by the manufacturer (Clause ZD.3, requirement Z9).

Such a control is supplied at rated voltage and operated at representative operating conditions. It is tested in accordance with EN 61000-4-8.

The severity levels for the declared EMC level are specified in Table ZD.9.

This is a preview of "BS EN 60730-1:2016+A...". Click here to purchase the full version from the ANSI store.

Table ZD.9 – Test levels for power-frequency magnetic field on enclosure

Control declaration EMC level	Power A/m	Frequency Hz
Residential	3	50 / 60 [a]
Industrial	30	50 / 60 [a]
[a] The test shall be carried out at the frequencies appropriate to the power supply frequency. Equipment intended for use in areas supplied only at one of these frequencies need only be tested at that frequency (Clause ZD.3, requirement Z9).		

Compliance criteria A: (see Table ZD.2)

ZD.10 Test of the influence of voltage dips and voltage interruption in the power supply network

During the test, the control shall be initially operated at its rated voltage. The control is operated at representative operating conditions.

It is tested in accordance with EN 61000-4-11. The test is only applicable to AC power input ports. The test levels for the declared EMC level are specified in Tables ZD.10 and ZD.11.

Table ZD.10 – Voltage dips (50 Hz / 60 Hz)

Control declaration EMC level	Voltage ΔU reduction	Duration in periods 50 Hz/60 Hz	Compliance criteria (see Table ZD.2)
Residential and industrial	30 %	25/30	C
Industrial	60 %	10/12	C
NOTE Voltage shift at zero crossing.			

Table ZD.11 – Voltage interruption (50 Hz / 60 Hz)

Control declaration EMC level	Voltage ΔU reduction	Duration in periods	Compliance criteria (see Table ZD.2)
Residential	100 %	0,5	B
Residential and industrial	100 %	1	B
Residential and industrial	100 %	250/300	C