SVENSK STANDARD SS-EN 60079-15

Fastställd	Utgåva	Sida	Ingår i
2005-12-19	2	1 (1+84)	SEK Område 31

Svenska Elektriska Kommissionen, SEK

Elektrisk utrustning för områden med explosiv gasatmosfär – Del 15: Utförande "n"

Electrical apparatus for explosive gas atmospheres –
Part 15: Construction, test and marking of type of protection "n" electrical apparatus

Som svensk standard gäller europastandarden EN 60079-15.2005. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60079-15:2005.

Nationellt förord

Europastandarden EN 60079-15:2005

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 60079-15, Third edition, 2005 - Electrical apparatus for explosive gas atmospheres - Part 15: Construction, test and marking of type of protection "n" electrical apparatus**

utarbetad inom International Electrotechnical Commission, IEC.

Standarden skall användas tillsammans med SS-EN 60079-0.

Tidigare fastställd svensk standard SS-EN 60079-15, utgåva 1, 2004, gäller ej fr o m 2008-06-01.

ICS 29.260.20

Denna standard är fastställd av Svenska Elektriska Kommissionen, SEK,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
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Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

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Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD **EN 60079-15**

NORME EUROPÉENNE

EUROPÄISCHE NORM October 2005

ICS 29.260.20 Supersedes EN 60079-15:2003

English version

Electrical apparatus for explosive gas atmospheres Part 15: Construction, test and marking of type of protection "n" electrical apparatus

(IEC 60079-15:2005)

Matériel électrique pour atmosphères explosives gazeuses
Partie 15: Construction, essais et marquage des matériels électriques du mode de protection "n"
(CEI 60079-15:2005)

Elektrische Betriebsmittel für gasexplosionsgefährdete Bereiche
Teil 15: Konstruktion, Prüfung und Kennzeichnung von elektrischen Betriebsmitteln der Zündschutzart "n"
(IEC 60079-15:2005)

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 60079-15:2005 E

Foreword

The text of document 31/558/FDIS, future edition 3 of IEC 60079-15, prepared by IEC TC 31, Electrical apparatus for explosive atmospheres, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60079-15 on 2005-06-01.

This European Standard is to be read in conjunction with EN 60079-0.

This European Standard supersedes EN 60079-15:2003.

The significant technical changes with respect to EN 60079-15:2003 are as follows:

– linking the standard to EN 60079-0 and adding Table 1 to show the connections;
– references to third party testing stations removed;
– adding the definition of associated energy limiting apparatus [nL] and [Ex nL];
– definitions eliminated that also appear in EN 60079-0;
– elimination of n-pressurization, all pressurization requirements now covered by EN 60079-2;
– air gap spark test requirement added for motors over 100 kW;
– added risk assessment tables for motors over 1 kV and over 100 kW;
– requirements changed for motors operating with frequency converters;
– references to other IEC and European standards updated for luminaires;
– caplights and handlights addressed by reference to EN 60079-0;
– creepage and clearance requirements for low powered apparatus between 60 V a.c. up to 250 V a.c. added in Table 10;
– requirement for plugs and sockets to maintain the degree of protection expanded;
– cable clamping test eliminated;
– insertion and removal torque values for E40/E39 lamp caps adjusted downward;
– high-voltage impulse test for ballasts eliminated;
– changes made to test and acceptance criteria in luminaire starter and ignitor tests;
– ignition tests for large or high-voltage machines added;
– marking and documentation sections changed to reflect changes elsewhere in the standard;
– manufacturer’s responsibility section dropped and replaced with instructions section.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2006-05-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2008-06-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 94/9/EC. See Annex ZZ.

Annexes ZA and ZZ have been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60079-15:2005 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60034-17	NOTE	Harmonized as CLC/TS 60034-17:2004 (not modified).
IEC 60068-2-6	NOTE	Harmonized as EN 60068-2-6:1995 (not modified).
IEC 60079-18	NOTE	Harmonized as EN 60079-18:2004 (not modified).
IEC 60297	NOTE	Harmonized in the HD 493 and EN 60297 series (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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

NOTE Where an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
		Cable glands for electrical installations	EN 50262	– [1)]
IEC 60034	Series	Rotating electrical machines	EN 60034	Series
IEC 60034-1	– [1)]	Part 1: Rating and performance	EN 60034-1	2004 [2)]
IEC 60034-5	– [1)]	Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification	EN 60034-5	2001 [2)]
IEC 60034-7	– [1)]	Part 7: Classification of types of construction, mounting arrangements and terminal box position (IM Code)	EN 60034-7	1993 [2)]
IEC/TS 60034-25	– [1)]	Part 25: Guide for the design and performance of cage induction motors specifically designed for converter supply	CLC/TS 60034-25	2005 [2)]
IEC 60061 (mod)	Series	Lamp caps and holders together with gauges for the control of interchangeability and safety	EN 60061	Series
IEC 60068-2-27	1987	Basic environmental testing procedures Part 2: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993
IEC 60079-0 (mod)	2004	Electrical apparatus for explosive gas atmospheres Part 0: General requirements	EN 60079-0	2004
IEC 60079-1	– [1)]	Electrical apparatus for explosive gas atmospheres Part 1: Flameproof enclosures 'd'	EN 60079-1 + corr. March	2004 [2)] 2004
IEC 60079-11	1999	Part 11: Intrinsic safety "i"	-	-
IEC 60079-17	– [1)]	Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines)	EN 60079-17	2003 [2)]

[1)] Undated reference.

[2)] Valid edition at date of issue.

Publication	Year	Title	EN/HD	Year
IEC 60081	– [1]	Double-capped fluorescent lamps - Performance specifications	EN 60081	1998 [2]
IEC 60112	– [1]	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	2003 [2]
IEC 60155	– [1]	Glow-starters for fluorescent lamps	EN 60155	1995 [2]
IEC 60238	1998	Edison screw lampholders	EN 60238	1998 [3]
IEC 60269-3	– [1]	Low-voltage fuses Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications)	EN 60269-3	1995 [2]
IEC 60400 (mod)	– [1]	Lampholders for tubular fluorescent lamps and starterholders	EN 60400	2000 [2]
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 60598-1 (mod)	1996	Luminaires Part 1: General requirements and tests	EN 60598-1	1997 [4]
IEC 60598-2 (mod)	Series	Part 2: Particular requirements	EN 60598-2	Series
IEC 60664-1	– [1]	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	EN 60664-1	2003 [2]
IEC 60927	1996	Auxiliaries for lamps - Starting devices (other than glow starters) - Performance requirements	EN 60927	1996
IEC 60998-2-4	1993	Connecting devices for low-voltage circuits for household and similar purposes Part 2-4: Particular requirements for twist-on connecting devices	EN 60998-2-4	1993 [5]
IEC 61048 (mod)	– [1]	Auxiliaries for lamps - Capacitors for use in tubular fluorescent and other discharge lamp circuits - General and safety requirements	EN 61048 + corr. December	1993 [2] 1998
IEC 61184	– [1]	Bayonet lampholders	EN 61184	1997 [2]
IEC 61347-1	– [1]	Lamp controlgear Part 1: General and safety requirements	EN 61347-1	2001 [2]

[3] EN 60238 is superseded by EN 60238:2004 (+ corrigendum January 2005) which is based on IEC 60238:2004.

[4] EN 60598-1 is superseded by EN 60598-1:2004, which is based on IEC 60598-1:2003 (modified).

[5] EN 60998-2-4 is superseded by EN 60998-2-4:2005, which is based on IEC 60998-2-4:2004 (modified).

Publication	Year	Title	EN/HD	Year
IEC 61347-2-1	– [1)]	Part 2-1: Particular requirements for starting devices (other than glow starters)	EN 61347-2-1	2001 [2)]
IEC 61347-2-2	– [1)]	Part 2-2: Particular requirements for d.c. or a.c. supplied electronic step-down convertors for filament lamps	EN 61347-2-2	2001 [2)]
IEC 61347-2-3	– [1)]	Part 2-3: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps	EN 61347-2-3	2001 [2)]
IEC 61347-2-4	– [1)]	Part 2-4: Particular requirements for d.c. supplied electronic ballasts for general lighting	EN 61347-2-4	2001 [2)]
IEC 61347-2-7	– [1)]	Part 2-7: Particular requirements for d.c. supplied electronic ballasts for emergency lighting	EN 61347-2-7	2001 [2)]
IEC 61347-2-8	– [1)]	Part 2-8: Particular requirements for ballasts for fluorescent lamps	EN 61347-2-8	2001 [2)]
IEC 61347-2-9	– [1)]	Part 2-9: Particular requirements for ballasts for discharge lamps (excluding fluorescent lamps)	EN 61347-2-9	2001 [2)]

CONTENTS

ELECTRICAL APPARATUS FOR EXPLOSIVE GAS ATMOSPHERES –

Part 15: Construction, test and marking of type of protection "n" electrical apparatus

1 Scope

This part of IEC 60079 specifies requirements for the construction, testing and marking for Group II electrical apparatus with type of protection, "n" intended for use in explosive gas atmospheres.

This part is applicable to non-sparking electrical apparatus and also to electrical apparatus with parts or circuits producing arcs or sparks or having hot surfaces which, if not protected in one of the ways specified in this standard, could be capable of igniting a surrounding explosive gas atmosphere. This standard describes several different methods by which this can be achieved which may be combined with other methods described in IEC 60079-0.

This part supplements the general requirements in IEC 60079-0. The relationship of IEC 60079-0 to this part is as indicated in Table 1.

Table 1 – Relationship of this part to IEC 60079-0

Clause of IEC 60079-0		IEC 60079-0 clause application to IEC 60079-15				
		Type of protection nC	Non sparking apparatus nA and nA nL	Restricted breathing apparatus nR	Energy limited apparatus nL	Associated energy limited apparatus [nL] and [Ex nL]
4	Apparatus grouping and temperature classification	Yes	Yes	Yes	Yes	Yes
5	Temperatures					
5.1	Environmental influences	Yes	Yes	Yes	Yes	Yes
5.2	Service temperature	Yes	Yes	Yes	Yes	Yes
5.3	Maximum surface temperature	Yes	Yes	Yes	Yes	No
5.4	Surface temperature and ignition temperature	No	No	No	No	No
5.5	Small components	Yes	Yes	Yes	Yes	No
6	Requirements for all electrical apparatus					
6.1	General	Yes	Yes	Yes	Yes	Yes
6.2	Mechanical strength of apparatus	Yes	Yes	Yes	Yes [c)]	No
6.3	Opening times	No	No	Yes	No	No
6.4	Circulating currents	Yes	Yes	Yes	No	No
6.5	Gasket retention	Yes	Yes	Yes	Yes	No

Clause of IEC 60079-0		IEC 60079-0 clause application to IEC 60079-15				
		Type of protection nC	**Non sparking apparatus nA and nA nL**	**Restricted breathing apparatus nR**	**Energy limited apparatus nL**	**Associated energy limited apparatus [nL] and [Ex nL]**
7	Non-metallic enclosures and non-metallic parts of enclosures					
7.1	General	Yes	Yes	Yes	Yes	No
7.2	Thermal endurance	Yes	Yes	Yes	Yes	No
7.3	Electrostatic charges on external non-metallic materials of enclosures	Yes	Yes	Yes	Yes	No
7.4	Threaded holes	Yes	Yes	Yes	Yes	No
8	Enclosures containing light metals					
8.1	Material composition	Yes	Yes	Yes	Yes	No
8.2	Threaded holes	Yes	Yes	Yes	Yes	No
9	Fasteners					
9.1	General	Yes	Yes	Yes	Yes	No
9.2	Special fasteners	No	No	No	No	No
9.3	Holes for special fasteners	No	No	No	No	No
10	Interlocking devices	No	No	No	No	No
11	Bushings	Yes	Yes	Yes	Yes	No
12	Materials used for cementing	No	No	No	No	No
13	Ex components	No	No	No	No	No
14	Connection facilities and terminal compartments	No	No	No	No	No
15	Connection facilities for earthing or bonding conductors	Yes	Yes	Yes	Yes	No
16	Entries into enclosures	Yes	Yes	Yes	Yes	No
17	Supplementary requirements for rotating electrical machines	No	Yes	No	No	No
18	Supplementary requirements for switchgear	Yes	Yes	Yes	No	No
19	Supplementary requirements for fuses	No	No	No	No	No
20	Supplementary requirements for plugs and sockets	No	No	No	No	No
21	Supplementary requirements for luminaires	No	No	No	No	No
22	Supplementary requirements for cap lights and handlights	Yes	Yes	Yes	No	No
23	Apparatus incorporating cells and batteries	Yes	Yes	Yes	Yes	No
24	Documentation	Yes	Yes	Yes	Yes	Yes

Clause of IEC 60079-0		IEC 60079-0 clause application to IEC 60079-15				
		Type of protection nC	**Non sparking apparatus nA and nA nL**	**Restricted breathing apparatus nR**	**Energy limited apparatus nL**	**Associated energy limited apparatus [nL] and [Ex nL]**
25	Compliance of prototype or sample with documents	Yes	Yes	Yes	Yes	Yes
26	Type tests					
26.1	General	Yes	Yes	Yes	Yes	Yes
26.2	Test configuration	Yes	Yes	Yes	Yes	Yes
26.3	Tests in explosive test mixtures	Yes	Yes	Yes	Yes	Yes
26.4	Tests of enclosures					
26.4.1	Order of tests	No	No	No	No	No
26.4.2	Resistance to impact	Yes	Yes	Yes	Yes	No
26.4.3	Drop test	Yes	Yes	Yes	Yes	No
26.4.4	Acceptance criteria for test for resistance to impact and drop test	Yes	Yes	Yes	Yes	No
26.4.5	Degree of protection IP by enclosures	No	No	No	No	No
26.5	Thermal tests					
26.5.1	Temperature measurement	Yes	Yes	Yes	Yes	No
26.5.2	Thermal shock test	Yes	Yes	Yes	Yes	No
26.5.3	Small component ignition test	Yes	Yes	No	Yes	No
26.6	Torque test for bushings	Yes	Yes	Yes	Yes	Yes
26.6.1	Procedure	Yes	Yes	Yes	Yes	Yes
26.6.2	Acceptance criteria	Yes	Yes	Yes	Yes	Yes
26.7	Non-metallic enclosures or of non-metallic parts of enclosures					
26.7.1	General	Yes	Yes	Yes	Yes	No
26.7.2	Temperatures during tests	Yes	Yes	Yes	Yes	No
26.8	Thermal endurance to heat	Yes	Yes	Yes	Yes	No
26.9	Thermal endurance to cold	Yes	Yes	Yes	Yes	No
26.10	Resistance to light	Yes	Yes	Yes	Yes	No
26.11	Resistance to chemical agents for Group I electrical apparatus	No	No	No	No	No
26.12	Earth continuity	Yes	Yes	Yes	Yes	No
26.13	Surface resistance test of parts of enclosures of non-metallic materials	Yes	Yes	Yes	Yes	No
26.14	Charging tests to verify the inability to store a dangerous charge	Yes	Yes	Yes	Yes	No

Clause of IEC 60079-0		IEC 60079-0 clause application to IEC 60079-15				
		Type of protection nC	**Non sparking apparatus nA and nA nL**	**Restricted breathing apparatus nR**	**Energy limited apparatus nL**	**Associated energy limited apparatus [nL] and [Ex nL]**
26.15	Measurement of capacitance to verify the inability to store a dangerous charge	Yes	Yes	Yes	Yes	Yes
26.15.1	Procedure	Yes	Yes	Yes	Yes	No
26.15.2	Acceptance criteria	Yes	Yes	Yes	Yes	No
27	Routine verifications and tests	Yes	Yes	Yes	Yes	Yes
28	Manufacturer's responsibility	Yes	Yes	Yes	Yes	Yes
28.1	Certificate	Yes	Yes	Yes	Yes	Yes
28.2	Responsibility for marking	Yes	Yes	Yes	Yes	Yes
29	Marking	Yes	Yes	Yes	Yes	Yes
30	Instructions	Yes	Yes	Yes	Yes	Yes

[a] An entry of “Yes” in the table indicates the requirements of the referenced section of IEC 60079-0 apply. An entry of “No” indicates the requirements either do not apply or have been modified by IEC 60079-15.

[b] Type of protection nC includes encapsulated devices, enclosed break devices, non-incendive components, sealed devices and hermetically sealed devices.

[c] Clause 6.2 is a calling clause for the tests in 26.4 which are different for both portable and fixed apparatus.

NOTE 1 A non-incendive component is limited in use to the particular circuit for which it has been shown to be non-ignition capable and, therefore, cannot be separately assessed as complying with this standard.

NOTE 2 Compliance with this standard does not imply any removal of, or lowering of the requirements of any other standard with which the electrical apparatus complies.

NOTE 3 This part supplements, and may enhance, the requirements for apparatus for normal industrial applications. Where compliance with other IEC standards is indicated, such as IEC 60034 for motors and IEC 60598-2 for luminaires, proving compliance to those standards is normally the responsibility of the manufacturer.

2 Normative references

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

IEC 60034 (all parts), *Rotating electrical machines*

IEC 60034-1, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60034-5, *Rotating electrical machines – Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP Code) – Classification*

IEC 60034-7, *Rotating electrical machines – Part 7: Classification of type of construction, mounting arrangements and terminal box position (IM Code)*

IEC 60034-25, *Rotating electrical machines – Part 25: Guide for the design and performance of cage induction motors specifically designed for converter supply*

IEC 60061 (all parts), *Lamp caps and holders together with gauges for the control of interchangeability and safety*

IEC 60068-2-27:1987, *Environmental testing – Part 2: Tests – Test Ea and guidance: Shock*

IEC 60079-0:2004, *Electrical apparatus for explosive gas atmospheres – Part 0: General requirements*

IEC 60079-1, *Electrical apparatus for explosive gas atmospheres – Part 1: Flameproof enclosures "d"*

IEC 60079-11:1999, *Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety "i"*

IEC 60079-17, *Electrical apparatus for explosive gas atmospheres – Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines)*

IEC 60081, *Double-capped fluorescent lamps – Performance specifications* [1]

IEC 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60155, *Glow-starters for fluorescent lamps*

IEC 60238:1998, *Edison screw lampholders* [1]

IEC 60269-3, *Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications)*

IEC 60400, *Lampholders for tubular fluorescent lamps and starterholders* [1]

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)* [1]

IEC 60598-1:1996, *Luminaires – Part 1: General requirements and tests*

IEC 60598-2 (all parts), *Luminaires – Part 2: Particular requirements*

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests* [1]

IEC 60927:1996*, Auxiliaries for lamps – Starting devices (other than glow starters) – Performance requirements* [1]

IEC 60998-2-4:1993, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-4: Particular requirements for twist-on connecting devices*

IEC 61048, *Auxiliaries for lamps – Capacitors for use in tubular fluorescent and other discharge lamp circuits – General and safety requirements* [1]

IEC 61184, *Bayonet lampholders*

IEC 61347-1, *Lamp controlgear – Part 1: General and safety requirements*

IEC 61347-2-1, *Lamp controlgear – Part 2-1: Particular requirements for starting devices (other than glow starters)*

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[1] A consolidated version of this standard exists.

IEC 61347-2-2, *Lamp controlgear – Part 2-2: Particular requirements for d.c. or a.c. supplied electronic step-down convertors for filament lamps*

IEC 61347-2-3, *Lamp controlgear – Part 2-3: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps* [2]

IEC 61347-2-4, *Lamp controlgear – Part 2-4: Particular requirements for d.c. supplied electronic ballasts for general lighting*

IEC 61347-2-7, *Lamp controlgear – Part 2-7: Particular requirements for d.c. supplied electronic ballasts for emergency lighting*

IEC 61347-2-8, *Lamp controlgear – Part 2-8: Particular requirements for ballasts for fluorescent lamps*

IEC 61347-2-9, *Lamp controlgear – Part 2-9: Particular requirements for ballasts for discharge lamps (excluding fluorescent lamps* [2]

EN 50262, *Metric cable glands for electrical installations*

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2 A consolidated version of this standard exists.