SVENSK STANDARD SS-EN 62520

Fastställd	Utgåva	Sida	Ansvarig kommitté
2012-04-11	1	1 (1+31)	SEK TK 9

Järnvägstillämpningar – Elektrisk traktion – Strömriktarmatade linjära asynkronmotorer med kort primärlindning

Railway applications – Electric traction – Short-primary type linear induction motors (LIM) fed by power converters

Som svensk standard gäller europastandarden EN 62520:2011. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62520:2011.

Nationellt förord

Europastandarden EN 62520:2011

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62520, First edition, 2011 - Railway applications - Electric traction - Short-primary type linear induction motors (LIM) fed by power converters**

utarbetad inom International Electrotechnical Commission, IEC.

ICS 45.060

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Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62520

August 2011

ICS 45.060

English version

Railway applications - Electric traction - Short-primary type linear induction motors (LIM) fed by power converters

(IEC 62520:2011)

Applications ferroviaires - Traction électrique - Moteurs à induction linéaires (LIM) du type à primaire court alimentés par des convertisseurs de puissance (CEI 62520:2011)

Elektrische Zugförderung - Elektrische Maschinen für Schienen- und Straßenfahrzeuge - Umrichtergespeiste Asynchron-Linearmotoren des Kurzstatortyps (IEC 62520:2011)

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 62520:2011 E

SEK Svensk Elstandard

Foreword

The text of document (9/1531/FDIS), future edition 1 of IEC 62520, prepared by IEC TC 9, Electrical equipment and systems for railways, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62520 on 2011-06-29.

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

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)	2012-03-29
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2014-06-29

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62520:2011 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 60034-5	NOTE	Harmonized as EN 60034-5.
IEC 61672-1	NOTE	Harmonized as EN 61672-1.
IEC 61260	NOTE	Harmonized as EN 61260.
IEC 61287-1	NOTE	Harmonized as EN 61287-1.
IEC 61377-1	NOTE	Harmonized as EN 61377-1.

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

Publication	Year	Title	EN/HD	Year
IEC 60034-8	-	Rotating electrical machines - Part 8: Terminal markings and direction of rotation	EN 60034-8	-
IEC 60050-131	-	International Electrotechnical Vocabulary (IEV) - Part 131: Circuit theory	-	-
IEC 60050-151	-	International Electrotechnical Vocabulary (IEV) - Part 151: Electrical and magnetic devices	-	-
IEC 60050-411	-	International Electrotechnical Vocabulary (IEV) - Chapter 411: Rotating machinery	-	-
IEC 60050-811	-	International electrotechnical vocabulary (IEV) - Chapter 811: Electric traction	-	-
IEC 60085	-	Electrical insulation - Thermal evaluation and designation	EN 60085	-
IEC 60349-2	2010	Electric traction - Rotating electrical machines for rail and road vehicles - Part 2: Electronic converter-fed alternating current motors	EN 60349-2	2010
IEC 60850	-	Railway applications - Supply voltages of traction systems	-	-
IEC 61133	2006	Railway applications - Rolling stock - Testing of rolling stock on completion of construction and before entry into service	-	-
IEC 61373	-	Railway applications - Rolling stock equipment - Shock and vibration tests	EN 61373	-

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INTRODUCTION

This International Standard is introduced because there are significant differences between the rotary induction motor and the linear induction motor (LIM). These differences necessitate a different testing standard to ensure consistency, repeatability and dependability of the test results. For clarification, the significant differences are listed below:

a) The LIM has a power factor and an electric efficiency substantially lower than those of rotary motors, because its magnetic gap length is several times that of the rotary motors. As such, the assumption made for the rotary induction motor that the primary leakage reactance is significantly less than the mutual reactance is no longer valid.

b) The traction efficiency of a LIM does not include the mechanical transmission, typical of rotary motor propulsion.

c) LIMs produce direct thrust between the primary and secondary without the need for mechanical contact. Therefore, there are no adhesion limits due to the rail and wheels contact of the typical rotary drive. No spin/slide controls are needed with LIMs and thus there is no need for testing of this function.

d) LIMs produce not only thrust (which is in the longitudinal direction) but also normal and lateral forces which are effectively eliminated in the rotary induction motor, due to the symmetrical geometry of rotary motor. The normal force is either an attraction or a repulsion between the primary and secondary. The effect of these forces should be considered on deflection of primary and secondary and for their mechanical strength and rigidity, particularly as the deflection will affect the gap between primary and secondary and thereby change the LIM performance.

e) The normal force mentioned in d) has a direct effect on the design of magnetically levitated vehicles. Depending on whether the normal force is attractive or repulsive, this force will either assist the suspension of the vehicle or oppose it. Thus testing of the LIM must ensure that the force occurs in the appropriate part of the LIM operating range.

f) Information in Table 1 should be shared with subsystem component designers. Particular attention is drawn to the need for collaboration between the designers of the LIM and its associated converter as detailed in 5.1.

RAILWAY APPLICATIONS – ELECTRIC TRACTION – SHORT-PRIMARY TYPE LINEAR INDUCTION MOTORS (LIM) FED BY POWER CONVERTERS

1 Scope

This International standard applies to short-primary type linear induction motors (LIM) for propelling rail and road vehicles.

This standard applies to a specific configuration of LIM that has the primary mounted on either the vehicle body or trucks and a secondary that is fixed to the track and that is connected only by a magnetic field with the primary.

The object of this standard is to allow the performance of a LIM to be confirmed by tests and to provide a basis for assessment of its suitability for a specified duty.

The rating of LIMs fed in parallel by a common converter should take into account the effect on load-sharing due to differences of gap length and of LIM characteristics. The user should be informed of the maximum permissible difference in gap length for the particular application.

The electrical input to LIMs covered by this standard should come from an electronic converter.

NOTE At the time of drafting, only the following combination of LIMs and converters had been used for traction applications, but it may also apply to other combinations which may be used in the future:

– LIMs fed by voltage source converters.

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 60034-8, *Rotating electrical machines – Part 8: Terminal markings and direction of rotation*

IEC 60050-131, *International Electrotechnical Vocabulary – Part 131: Circuit theory*

IEC 60050-151, *International Electrotechnical Vocabulary – Part 151: Electrical and magnetic devices*

IEC 60050-411, *International Electrotechnical Vocabulary – Part 411: Rotating machinery*

IEC 60050-811, *International Electrotechnical Vocabulary – Part 811: Electric traction*

IEC 60085, *Electrical insulation – Thermal evaluation and designation*

IEC 60349-2:2010, *Electric traction – Rotating electrical machines for rail and road vehicles – Part 2: Electronic convertor-fed alternating current motors*

IEC 60850, *Railway applications – Supply voltages of traction systems*

IEC 61133:2006, *Railway applications – Rolling stock – Testing of rolling stock on completion of construction and before entry into service*

IEC 61373, *Railway applications – Rolling stock equipment – Shock and vibration tests*