

# TECHNICAL SPECIFICATION



Rotating electrical machines –  
Part 25: AC electrical machines used in power drive systems – Application guide

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## CONTENTS

FOREWORD.....	9
INTRODUCTION.....	11
1 Scope.....	12
2 Normative references .....	12
3 Terms and definitions .....	13
4 System characteristics.....	16
4.1 General.....	16
4.2 System information .....	16
4.3 Torque/speed considerations .....	16
4.3.1 General .....	16
4.3.2 Torque/speed capability.....	17
4.3.3 Electrical machine rating.....	18
4.3.4 Limiting factors on torque/speed capability .....	18
4.3.5 Safe operating speed, over-speed capability and over-speed test.....	19
4.3.6 Cooling arrangement .....	19
4.3.7 Voltage/frequency characteristics .....	20
4.3.8 Resonant speed bands .....	20
4.3.9 Duty cycles.....	21
4.4 Electrical machine requirements .....	21
5 Losses and their effects (for induction electrical machines fed from voltage source converters).....	24
5.1 General.....	24
5.2 Location of the additional losses due to converter supply and ways to reduce them .....	25
5.3 Converter features to reduce the electrical machine losses.....	26
5.3.1 Reduction of fundamental losses .....	26
5.3.2 Reduction of additional losses due to converter supply.....	26
5.4 Use of filters to reduce additional electrical machine losses due to converter supply.....	27
5.5 Temperature influence on life expectancy .....	27
5.6 Determination of electrical machine efficiency.....	28
6 Acoustic noise, vibration and torsional oscillation .....	28
6.1 Acoustic noise .....	28
6.1.1 General .....	28
6.1.2 Changes in noise emission due to changes in speed .....	28
6.1.3 Magnetically excited noise.....	29
6.1.4 Sound power level determination and limits .....	31
6.2 Vibration (excluding torsional oscillation) .....	31
6.2.1 General .....	31
6.2.2 Vibration level determination and limits.....	32
6.3 Torsional oscillation .....	32
7 Electrical machine insulation electrical stresses .....	33
7.1 General.....	33
7.2 Causes .....	33
7.3 Winding electrical stress .....	35
7.4 Limits and responsibility.....	36

7.4.1	Electrical machines design for low voltage ( $\leq 1\ 000\ \text{V}$ ) .....	36
7.4.2	Electrical machines designed for medium and high voltage ( $> 1\ 000\ \text{V}$ ) .....	37
7.5	Methods of reduction of voltage stress .....	37
7.6	Insulation stress limitation.....	38
8	Bearing currents .....	39
8.1	Sources of bearing currents in converter-fed electrical motors .....	39
8.1.1	General .....	39
8.1.2	Circulating currents due to magnetic asymmetry .....	39
8.1.3	Electrostatic build-up .....	39
8.1.4	High-frequency effects in converter operation .....	39
8.2	Generation of high-frequency bearing currents.....	41
8.2.1	Common mode voltage .....	41
8.2.2	Motor HF equivalent circuit and the resulting bearing current types .....	42
8.2.3	Circulating current .....	44
8.2.4	Rotor ground current .....	44
8.2.5	Electrostatic Discharge Machining (EDM) currents.....	45
8.3	Consequences of excessive bearing currents.....	46
8.4	Preventing high-frequency bearing current damage .....	50
8.4.1	Basic approaches .....	50
8.4.2	Other preventive measures .....	51
8.4.3	Other factors and features influencing the bearing currents .....	54
8.5	Additional considerations for electrical motors fed by high voltage source converters.....	54
8.5.1	General .....	54
8.5.2	Bearing protection of cage induction, brushless synchronous and permanent magnet electrical motors .....	54
8.5.3	Bearing protection for slip-ring electrical motors and for synchronous electrical motors with brush excitation .....	54
8.6	Bearing current protection for electrical motors fed by high-voltage current source converters .....	55
9	Installation.....	55
9.1	Earthing, bonding and cabling.....	55
9.1.1	General .....	55
9.1.2	Earthing.....	55
9.1.3	Bonding of electrical machines .....	55
9.1.4	Electrical machine power cables for high switching frequency converters .....	56
9.2	Reactors and filters.....	61
9.2.1	General .....	61
9.2.2	Output reactors.....	61
9.2.3	Voltage limiting filter ( $du/dt$ filter) .....	61
9.2.4	Sinusoidal filter.....	61
9.2.5	Electrical machine termination unit .....	61
9.3	Power factor correction .....	62
9.4	Integral electrical machines (integrated electrical machine and drive modules).....	63
10	Additional considerations for permanent magnet (PM) synchronous electrical machines fed by voltage source converters .....	63
10.1	System characteristics .....	63
10.2	Losses and their effects .....	63

10.3	Noise, vibration and torsional oscillation .....	64
10.4	Electrical machine insulation electrical stresses .....	64
10.5	Bearing currents .....	64
10.6	Particular aspects of permanent magnets .....	64
11	Additional considerations for cage induction electrical machines fed by high voltage source converters.....	64
11.1	General.....	64
11.2	System characteristics .....	65
11.3	Losses and their effects .....	66
11.3.1	Additional losses in the stator and rotor winding .....	66
11.3.2	Measurement of additional losses .....	66
11.4	Noise, vibration and torsional oscillation .....	66
11.5	Electrical machine insulation electrical stresses.....	67
11.5.1	General .....	67
11.5.2	Electrical machine terminal overvoltage.....	67
11.5.3	Stator winding voltage stresses in converter applications.....	67
11.6	Bearing currents .....	69
12	Additional considerations for synchronous electrical machines fed by voltage source converters .....	69
12.1	System characteristics .....	69
12.2	Losses and their effects .....	69
12.3	Noise, vibration and torsional oscillation .....	69
12.4	Electrical machine insulation electrical stresses.....	69
12.5	Bearing currents .....	70
13	Additional considerations for cage induction electrical machines fed by block-type current source converters .....	70
13.1	System characteristics (see Figure 35 and Figure 36).....	70
13.2	Losses and their effects .....	71
13.3	Noise, vibration and torsional oscillation .....	73
13.4	Electrical machine insulation electrical stresses.....	73
13.5	Bearing currents .....	73
13.6	Additional considerations for six-phase cage induction electrical machines.....	74
14	Additional considerations for synchronous electrical machines fed by LCI .....	74
14.1	System characteristics .....	74
14.2	Losses and their effects .....	75
14.3	Noise, vibration and torsional oscillation .....	75
14.4	Electrical machine insulation electrical stresses.....	75
14.5	Bearing currents .....	75
15	Additional considerations for cage induction electrical machines fed by pulsed current source converters (PWM CSI).....	76
15.1	System characteristics (see Figure 39) .....	76
15.2	Losses and their effects .....	77
15.3	Noise, vibration and torsional oscillation .....	77
15.4	Electrical machine insulation electrical stresses.....	77
15.5	Bearing currents .....	77
16	Wound rotor induction (asynchronous) electrical machines supplied by voltage source converters in the rotor circuit.....	77
16.1	System characteristics .....	77
16.2	Losses and their effects .....	77

16.3	Noise, vibration and torsional oscillation .....	78
16.4	Electrical machine insulation electrical stresses .....	78
16.5	Bearing currents .....	78
17	Other electrical machine/converter systems .....	78
17.1	Drives supplied by cyclo-converters .....	78
17.2	Wound rotor induction (asynchronous) electrical machines supplied by current source converters in the rotor circuit .....	80
18	Special consideration for standard fixed-speed induction electrical machines in the scope of IEC 60034-12 when fed from voltage source converter and motor requirements to be considered a converter capable motor .....	80
18.1	General .....	80
18.2	Torque derating during converter operation .....	82
18.2.1	General .....	82
18.2.2	Self-cooled motors .....	83
18.2.3	Non self-cooled motors .....	84
18.3	Losses and their effects .....	84
18.4	Noise, vibrations and torsional oscillation .....	84
18.5	Electrical machine insulation electrical stresses .....	84
18.5.1	General .....	84
18.5.2	Converter capable motor .....	85
18.6	Bearing currents in converter capable motors .....	85
18.7	Speed range mechanical limits .....	86
18.7.1	General .....	86
18.7.2	Maximum speed .....	86
18.7.3	Minimum speed .....	86
18.8	Overload torque capability .....	87
18.9	Excess overload current limits .....	87
18.9.1	General .....	87
18.9.2	Converter capable motor .....	87
18.10	Volts/Hz ratio and voltage boost .....	87
18.11	Resonance .....	87
18.12	Hazardous area operation .....	87
18.12.1	General .....	87
18.12.2	Converter capable motor .....	88
18.13	Unusual service conditions .....	89
18.13.1	Converter capable motors .....	89
18.13.2	Unusual converter-fed applications .....	89
19	Additional considerations for synchronous reluctance electrical machine fed by voltage source converters .....	89
19.1	System characteristics .....	89
19.2	Losses and their effects .....	89
19.3	Noise, vibration and torsional oscillation .....	89
19.4	Electrical machine insulation electrical stresses .....	89
19.5	Bearing currents .....	89
19.6	Particular aspects of synchronous reluctance electrical machines .....	90
Annex A (informative)	Converter characteristics .....	91
A.1	Converter control types .....	91
A.1.1	General .....	91
A.1.2	Converter type considerations .....	92

A.2	Converter output voltage generation (for voltage source converters).....	92
A.2.1	Pulse width modulation (PWM) .....	92
A.2.2	Hysteresis (sliding mode) .....	93
A.2.3	Influence of switching frequency .....	93
A.2.4	Multi-level converters.....	94
A.2.5	Parallel converter operation .....	95
Annex B	(informative) Output characteristics of 2 level voltage source converter spectra .....	96
Annex C	(informative) Voltages to be expected at the power interface between converter and electrical machine.....	100
Annex D	(informative) Speed and harmonic capability of converter capable induction motor .....	104
D.1	General.....	104
D.2	Harmonic capability of converter capable motors .....	104
D.3	Speed capability and derating in variable torque application .....	105
D.4	Speed capability and derating in a constant torque application .....	105
Bibliography	.....	107
Figure 1	– Torque/speed capability .....	17
Figure 2	– Current required by motor .....	18
Figure 3	– Examples of possible converter output voltage/frequency characteristics .....	20
Figure 4	– Example for the dependence of the electrical machine losses caused by harmonics $P_h$ , related to the losses $P_{f1}$ at operating frequency $f_1$ , on the switching frequency $f_s$ in case of 2 level voltage source converter supply .....	25
Figure 5	– Example of measured losses $P_L$ as a function of frequency $f$ and supply type .....	26
Figure 6	– Additional losses $\Delta P_L$ of an electrical machine (same electrical machine as Figure 5) due to converter supply, as a function of pulse frequency $f_p$ , at 50 Hz rotational frequency .....	27
Figure 7	– Relative fan noise as a function of fan speed .....	29
Figure 8	– Vibration modes of the stator core.....	30
Figure 9	– Typical surges at the terminals of an electrical machine fed from a PWM converter .....	33
Figure 10	– Typical voltage surges on one phase at the converter and at the electrical machine terminals (2 ms/division) .....	34
Figure 11	– Individual short rise-time surge from Figure 10 (1 $\mu$ s/division) .....	34
Figure 12	– Definition of the rise-time $t_r$ of the voltage pulse at the electrical machine terminals.....	35
Figure 13	– First turn voltage as a function of the rise-time .....	36
Figure 14	– Discharge pulse occurring as a result of converter generated voltage surge at electrical machine terminals (100 ns/division) .....	38
Figure 15	– Classification of bearing currents .....	39
Figure 16	– Parasitic impedances to earth of drive system components .....	40
Figure 17	– Common mode voltage a) determination b) waveform example .....	41
Figure 18	– HF equivalent circuit diagram (a) of a motor (b) geometrical representation of capacitances.....	42
Figure 19	– Graphical representation of the different high frequency bearing current types in the drive unit highlighting the involved physical components.....	43



Figure 20 – Principle of circulating currents formation .....	44
Figure 21 – Rotor ground current principle .....	45
Figure 22 – Example of measured EDM-current pulses for a 400 V and 500 kW induction motor in converter operation .....	46
Figure 23 – Photographs of damaged motor bearings .....	47
Figure 24 – Bonding strap from electrical machine terminal box to electrical machine frame .....	56
Figure 25 – Examples of shielded electrical machine cables and connections .....	57
Figure 26 – Parallel symmetrical cabling of high-power converter and electrical machine .....	58
Figure 27 – Converter connections with 360° HF cable glands showing the Faraday cage .....	59
Figure 28 – Electrical machine end termination with 360° connection .....	59
Figure 29 – Cable shield connection .....	60
Figure 30 – Characteristics of preventative measures .....	62
Figure 31 – Schematic of typical three-level converter .....	65
Figure 32 – Output voltage and current from typical three-level converter .....	65
Figure 33 – Typical first turn voltage $\Delta U$ (as a percentage of the line-to-ground voltage) as a function of $du/dt$ .....	67
Figure 34 – Medium-voltage and high-voltage form-wound coil insulating and voltage stress control materials .....	68
Figure 35 – Schematic of block-type current source converter .....	70
Figure 36 – Current and voltage waveforms of block-type current source converter .....	70
Figure 37 – Influence of converter supply on the losses of a cage induction electrical machine (frame size 315 M, design N) with rated values of torque and speed .....	72
Figure 38 – Schematic and voltage and current waveforms for a synchronous electrical machine supplied from a current source converter .....	74
Figure 39 – Schematic of pulsed current source converter .....	76
Figure 40 – Voltages and currents of pulsed current source converter .....	76
Figure 41 – Schematic of cyclo-converter .....	78
Figure 42 – Voltage and current waveforms of a cyclo-converter .....	79
Figure 43 – Diagram comparing converter capable motor to converter duty motor .....	81
Figure 44 – Fundamental voltage $U_1$ as a function of operating frequency $f_1$ .....	82
Figure 45 – Torque derating factor for cage induction electrical machines of design N, IC 411 (self-circulating cooling) as a function of operating frequency $f_1$ (example) .....	83
Figure A.1 – Effects of switching frequency on electrical machine and converter losses .....	93
Figure A.2 – Effects of switching frequency on acoustic noise .....	94
Figure A.3 – Effects of switching frequency on torque ripple .....	94
Figure B.1 – Waveform of line-to-line voltage $U_{LL}$ for voltage source converter supply with switching frequency $f_s = 30 \times f_1$ (example) .....	96
Figure B.2 – Typical output voltage frequency spectra for a constant frequency PWM control versus hysteresis control .....	97
Figure B.3 – Typical output voltage frequency spectra for random frequency PWM versus hysteresis control .....	97
Figure B.4 – Typical output voltage frequency spectra for a two-phase modulated control versus hysteresis modulation .....	98

Figure B.5 – Typical time characteristics of electrical machine current for a Constant frequency PWM control versus hysteresis control .....	98
Figure B.6 – Typical time characteristics of electrical machine current for a two-phase modulated control versus hysteresis modulation .....	99
Figure C.1 – Example of typical voltage curves and parameters of a two level inverter versus time at the electrical machine terminals (phase to phase voltage; taken from IEC TS 61800-8).....	100
Figure D.1 – Derating curve for harmonic voltages.....	105
Figure D.2 – Torque capability at reduced speeds due to the effects of reduced cooling (applies to 50 Hz or 60 Hz design N).....	106
Table 1 – Significant factors affecting torque/speed capability .....	19
Table 2 – Electrical machine design considerations .....	22
Table 3 – Electrical machine parameters for the tuning of the converter.....	23
Table 4 – Operating voltage at the terminals in units of $U_N$ where the electrical machines may operate reliably without special agreements between manufacturers and system integrators .....	37
Table 5 – Different grades of roller bearing damages .....	48
Table 6 – Effectiveness of bearing current counter measures .....	52

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**ROTATING ELECTRICAL MACHINES –****Part 25: AC electrical machines used in power drive systems –  
Application guide**

## FOREWORD

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This fourth edition of IEC TS 60034-25 cancels and replaces the third edition, published in 2014.

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

- a) The definitions of a converter capable motor and a converter duty motor are added.
- b) Clause 18 modified to include the performance expectations of a converter capable motor.
- c) Clause 8 modified to update shaft currents section.
- d) Annex D added to define the derating requirements.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
2/2067/DTS	2/2097/RVDTS

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

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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## INTRODUCTION

The performance characteristics and operating data for converter-fed electrical machines are influenced by the complete drive system, comprising supply system, converter, cabling, electrical machine, mechanical shafting and control equipment. Each of these components exists in numerous technical variants. Any values quoted in this document are thus indicative only.

In view of the complex technical interrelations within the system and the variety of operating conditions, it is beyond the scope and object of this document to specify numerical or limiting values for all the quantities which are of importance for the design of the power drive system.

To an increasing extent, it is the practice that power drive systems consist of components produced by different manufacturers. The object of this document is to explain, as far as possible, the influence of these components on the design of the electrical machine and its performance characteristics.

This document deals with both AC electrical machines which are specifically designed for converter supply and converter-fed electrical machines within the scope of IEC 60034-12, which are designed originally for mains supply.

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## ROTATING ELECTRICAL MACHINES –

### Part 25: AC electrical machines used in power drive systems – Application guide

#### 1 Scope

This part of IEC 60034 describes the performance characteristics of AC electrical machines for use on converter supplies. For electrical machines specifically designed for converter duty application design features are defined. It also specifies the interface parameters and interactions between the electrical machine and the converter including installation guidance as part of a power drive system, but except for the voltage at the power interface which is described in IEC TS 61800-8.

The general requirements of relevant parts of the IEC 60034 series of standards also apply to electrical machines within the scope of this document.

For electrical machines operating in potentially explosive atmospheres, additional requirements as described in the IEC 60079 series for dust ignition proof apply.

This document is not primarily concerned with safety. However, some of its recommendations may have implications for safety, which are considered as necessary.

Where a converter manufacturer provides specific installation recommendations, they take precedence over the recommendations of this document.

#### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60034-1:2022, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60034-2-1, *Rotating electrical machines – Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)*

IEC 60034-2-2, *Rotating electrical machines – Part 2-2: Specific methods for determining separate losses of large machines from tests – Supplement to IEC 60034-2-1*

IEC 60034-2-3, *Rotating electrical machines – Part 2-3: Specific test methods for determining losses and efficiency of converter-fed AC induction motors*

IEC 60034-6, *Rotating electrical machines – Part 6: Methods of cooling (IC Code)*

IEC 60034-9:2021, *Rotating electrical machines – Part 9: Noise limits*

IEC 60034-12, *Rotating electrical machines – Part 12: Starting performance of single-speed three-phase cage induction motors*

IEC 60034-14:2018, *Rotating electrical machines – Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher – Measurement, evaluation and limits of vibration severity*

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IEC 60079 (all parts): *Explosive atmospheres*

IEC 60079-7, *Explosive atmospheres – Part 7: Equipment protection by increased safety "e"*

IEC TR 61000-5-1, *Electromagnetic compatibility (EMC) – Part 5: Installation and mitigation guidelines – Section 1: General considerations – Basic EMC publication*

IEC TR 61000-5-2, *Electromagnetic compatibility (EMC) – Part 5: Installation and mitigation guidelines – Section 2: Earthing and cabling*

IEC 61800-3, *Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods*

IEC 61800-5-1, *Adjustable speed electrical power drive systems – Part 5-1: Safety requirements – Electrical, thermal and energy* 034-25:2022

<https://standards.iteh.ai/catalog/standards/sist/3db1a02c-81b7-4b24-b53f->

IEC TS 61800-8:2010, *Adjustable speed electrical power drive systems – Part 8: Specification of voltage on the power interface*

IEC TS 62578:2015, *Power electronics systems and equipment – Operation conditions and characteristics of active infeed converter (AIC) applications including design recommendations for their emission values below 150 kHz*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### 3.1

##### **bearing voltage ratio**

##### **BVR**

ratio of the capacitively coupled bearing voltage to the common-mode voltage