IEC 62135-2

Edition 3.0 2020-03

REDLINE VERSION

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Resistance welding equipment –
Part 2: Electromagnetic compatibility (EMC) requirements

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 25.160.30

ISBN 978-2-8322-8113-0

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RESISTANCE WELDING EQUIPMENT –

Part 2: Electromagnetic compatibility (EMC) requirements

FOREWORD

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This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 62135-2 has been prepared by IEC technical committee 26: Electric welding.

This third edition cancels and replaces the second edition published in 2015. This edition constitutes a technical revision.

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

a) update of the applicable limits related to the updated references;

b) implementation of radiated magnetic field requirements.

The text of this standard is based on the following documents:

FDIS	Report on voting
26/696/FDIS	26/698/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 62135 series, under the general title *Resistance welding equipment*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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RESISTANCE WELDING EQUIPMENT –

Part 2: Electromagnetic compatibility (EMC) requirements

1 Scope

This part of IEC 62135 is applicable to equipment for resistance welding and allied processes which are connected to mains supplies with rated voltages up to 1 000 V AC RMS. This document does not define safety requirements.

Resistance welding equipment type tested in accordance with, and which has met the requirements of, this document, is deemed to be in compliance for all applications.

The frequency range covered is from 0 Hz to 400 GHz.

Arc welding equipment containing a radio receiver or transmitter is within the scope of this document. Additional requirements for such equipment is specified in Annex D.

The radiated emission requirements in this document are not intended to be applicable to the intentional transmissions from a radio transmitter as defined by the ITU nor to any spurious emissions related to these intentional transmitters.

This product EMC standard for resistance welding equipment takes precedence over all aspects of the generic standards and no additional EMC tests are required or necessary.

NOTE 1 Typical allied processes are resistance hard and soft soldering or resistance heating achieved by means comparable to resistance welding equipment.

NOTE 2 Limit values are specified for only part of the frequency range.

Resistance welding equipment are classified as Class A and Class B equipment.

This part of IEC 62135 specifies

a) test methods to be used in conjunction with CISPR 11:2015, CISPR 11:2015/AMD1:2016 and CISPR 11:2015/AMD2:2019 to determine radio-frequency (RF) emission;

b) relevant standards and test methods for harmonic current emission, voltage fluctuation and flicker;

c) additional requirements for equipment powered by internal or external batteries (Annex C).

NOTE 3 The limits in this document cannot, however, provide full protection against interference to radio and television reception when the resistance welding equipment is used closer than 30 m to the receiving antenna(e).

NOTE 4 In special cases, when highly susceptible apparatus is being used in close proximity, additional mitigation measures are sometimes employed to further reduce the electromagnetic emissions.

NOTE 5 The origins of the limit values in this document are summarized in Annex A.

This part of IEC 62135 also defines immunity requirements and test methods for continuous and transient, conducted and radiated disturbances including electrostatic discharges.

NOTE 6 These requirements do not, however, cover extreme cases which are extremely rare.

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 60050-161, *International Electrotechnical Vocabulary – Chapter 161: Electromagnetic compatibility*~~

~~IEC 60050-851, *International Electrotechnical Vocabulary – Part 851: Electric welding*~~

IEC 61000-3-2:~~2014~~2018, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*

IEC 61000-3-3:2013, *Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection*
IEC 61000-3-3:2013/AMD1:2017

IEC 61000-3-11:~~2000~~2017, *Electromagnetic compatibility (EMC) – Part 3-11: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems – Equipment with rated current ≤ 75 A and subject to conditional connection*

IEC 61000-3-12:2011, *Electromagnetic compatibility (EMC) – Part 3-12: Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase*

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3 : Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*
IEC 61000-4-3:2006/AMD1:2007
IEC 61000-4-3:2006/AMD2:2010

IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*
IEC 61000-4-5:2014/AMD1:2017

IEC 61000-4-6:2013, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*
IEC 61000-4-11:2004/AMD1:2017

IEC 61000-4-34:2005, *Electromagnetic compatibility (EMC) – Part 4-34: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current more than 16 A per phase*
IEC 61000-4-34:2005/AMD1:2009

IEC 61000-6-1:2016, *Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity standard for residential, commercial and light-industrial environments*

IEC 61000-6-2:2016, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments*

IEC 61000-6-3:2006, *Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments*
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IEC 61000-6-4:2018, *Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments*

IEC 62135-1:2015, *Resistance welding equipment – Part 1: Safety requirements for design, manufacture and installation*

ISO 669:2016, *Resistance welding – Resistance welding equipment – Mechanical and electrical requirements*

CISPR 11:~~2009~~2015, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*
~~CISPR 11:2009/AMD 1:2010~~
CISPR 11:2015/AMD1:2016
CISPR 11:2015/AMD2:2019

CISPR 16-1-1:2019, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

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~~ISO 669, *Resistance welding – Resistance welding equipment – Mechanical and electrical requirements*~~

IEC 62135-2

Edition 3.0 2020-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Resistance welding equipment – Part 2: Electromagnetic compatibility (EMC) requirements

Matériels de soudage par résistance – Partie 2: Exigences de compatibilité électromagnétique (CEM)



IEC 62135-2:2020-03(en-fr)

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ISO 669:2016, *Resistance welding – Resistance welding equipment – Mechanical and electrical requirements*

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CISPR 11:2015/AMD2:2019

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CISPR 16-1-2:2014, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Coupling devices for conducted disturbance measurements*
CISPR 16-1-2:2014/AMD1:2017

CISPR 16-1-4:2019, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Antennas and test sites for radiated disturbance measurements*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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MATÉRIELS DE SOUDAGE PAR RÉSISTANCE –

Partie 2: Exigences de compatibilité électromagnétique (CEM)

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La Norme internationale IEC 62135-2 a été établie par le comité d'études 26 de l'IEC: Soudage électrique.

Cette troisième édition annule et remplace la deuxième édition parue en 2015. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) mise à jour des limites applicables conformément aux références mises à jour;
b) mise en œuvre des exigences du champ magnétique rayonné.

Le texte de cette norme est issu des documents suivants:

FDIS	Rapport de vote
26/696/FDIS	26/698/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 62135, publiées sous le titre général *Matériels de soudage par résistance*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de cette publication ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous " http://webstore.iec.ch " dans les données relatives à la publication recherchée. À cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

MATÉRIELS DE SOUDAGE PAR RÉSISTANCE –

Partie 2: Exigences de compatibilité électromagnétique (CEM)

1 Domaine d'application

La présente partie de l'IEC 62135 est applicable aux matériels de soudage par résistance et procédés connexes qui sont connectés aux réseaux d'alimentation avec des tensions assignées jusqu'à 1 000 V efficace en courant alternatif. Le présent document ne définit pas d'exigences de sécurité.

Les matériels de soudage par résistance ayant fait l'objet d'un essai de type conforme au présent document et qui en ont rempli les exigences sont considérés comme étant conformes pour toutes les applications.

La plage de fréquences couverte est de 0 Hz à 400 GHz.

Les matériels de soudage à l'arc contenant un récepteur ou un émetteur radio relèvent du domaine d'application du présent document. Des exigences supplémentaires applicables à de tels matériels sont spécifiées dans l'Annexe D.

Les exigences en matière d'émissions rayonnées contenues dans le présent document ne sont pas destinées à s'appliquer aux transmissions intentionnelles d'un émetteur radio telles que définies par l'UIT ni aux émissions parasites associées à ces émetteurs intentionnels.

La présente norme de produit CEM pour les matériels de soudage par résistance prévaut sur tous les aspects des normes génériques et aucun essai additionnel CEM n'est exigé ou nécessaire.

NOTE 1 Le brasage tendre et fort par résistance ou le chauffage par résistance par des moyens comparables au matériel de soudage par résistance sont des procédés connexes typiques.

NOTE 2 Les valeurs limites ne sont spécifiées que pour une partie de la plage de fréquences.

Les matériels de soudage par résistance sont classés en matériels de Classe A et de Classe B.

La présente partie de l'IEC 62135 spécifie

a) les méthodes d'essai à utiliser conjointement à la CISPR 11:2015, CISPR 11:2015/AMD1:2016 et CISPR 11:2015/AMD2:2019 pour déterminer l'émission radiofréquence (RF);
b) les normes pertinentes et les méthodes d'essai pour l'émission de courant harmonique, la fluctuation de tension et le papillotement;
c) les exigences supplémentaires pour les matériels alimentés par des batteries internes ou externes (Annexe C).

NOTE 3 Les limites du présent document ne peuvent pas, toutefois, fournir une pleine protection contre les interférences à la réception de la radio et de la télévision quand le matériel de soudage par résistance est utilisé à moins de 30 m d'une ou de plusieurs antennes réceptrices.

NOTE 4 Dans des cas spéciaux, quand un appareil de grande sensibilité est utilisé dans un voisinage proche, des mesures d'atténuation additionnelles sont parfois utilisées pour réduire davantage les émissions électromagnétiques.

NOTE 5 Les origines des valeurs limites dans le présent document sont résumées dans l'Annexe A.

La présente partie de l'IEC 62135 définit les exigences d'immunité et les méthodes d'essai pour les perturbations continues et transitoires, conduites et rayonnées, y compris les décharges électrostatiques.

NOTE 6 Ces exigences ne couvrent pas, toutefois, les cas extrêmes qui sont particulièrement rares.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 61000-3-2:2018, *Compatibilité électromagnétique (CEM) – Partie 3-2: Limites – Limites pour les émissions de courant harmonique (courant appelé par les appareils ≤ 16 A par phase)*

IEC 61000-3-3:2013, *Compatibilité électromagnétique (CEM) – Partie 3-3: Limites – Limitation des variations de tension, des fluctuations de tension et du papillotement dans les réseaux publics d'alimentation basse tension, pour les matériels ayant un courant assigné ≤ 16 A par phase et non soumis à un raccordement conditionnel*
IEC 61000-3-3:2013/AMD1:2017

IEC 61000-3-11:2017,*Compatibilité électromagnétique (CEM) – Partie 3-11: Limites – Limitation des variations de tension, des fluctuations de tension et du papillotement dans les réseaux publics d'alimentation basse tension – Équipements ayant un courant assigné ≤ 75 A et soumis à un raccordement conditionnel*

IEC 61000-3-12:2011, *Compatibilité électromagnétique (CEM) – Partie 3-12: Limites – Limites pour les courants harmoniques produits par les appareils connectés aux réseaux publics basse tension ayant un courant appelé > 16 A et ≤ 75 A par phase*

IEC 61000-4-2:2008, *Compatibilité électromagnétique (CEM) – Partie 4-2: Techniques d'essai et de mesure – Essai d'immunité aux décharges électrostatiques*

IEC 61000-4-3:2006, *Compatibilité électromagnétique (CEM) – Partie 4-3: Techniques d'essai et de mesure – Essai d'immunité aux champs électromagnétiques rayonnés aux fréquences radioélectriques*
IEC 61000-4-3:2006/AMD1:2007
IEC 61000-4-3:2006/AMD2:2010

IEC 61000-4-4:2012, *Compatibilité électromagnétique (CEM) – Partie 4-4: Techniques d'essai et de mesure – Essais d'immunité aux transitoires électriques rapides en salves*

IEC 61000-4-5:2014, *Compatibilité électromagnétique (CEM) – Partie 4-5: Techniques d'essai et de mesure – Essai d'immunité aux ondes de choc*
IEC 61000-4-5:2014/AMD1:2017

IEC 61000-4-6:2013, *Compatibilité électromagnétique (CEM) – Partie 4-6: Techniques d'essai et de mesure – Immunité aux perturbations conduites, induites par les champs radioélectriques*

IEC 61000-4-11:2004, *Compatibilité électromagnétique (CEM) – Partie 4-11: Techniques d'essai et de mesure – Essais d'immunité aux creux de tension, coupures brèves et variations de tension*
IEC 61000-4-11:2004/AMD1:2017

IEC 61000-4-34:2005, *Compatibilité électromagnétique (CEM) – Partie 4-34: Techniques d'essai et de mesure – Essais d'immunité aux creux de tension, coupures brèves et variations de tension pour matériel ayant un courant appelé de plus de 16 A par phase*
IEC 61000-4-34:2005/AMD1:2009

IEC 61000-6-1:2016, *Compatibilité électromagnétique (CEM) – Partie 6-1: Normes génériques – Norme d'immunité pour les environnements résidentiels, commerciaux et de l'industrie légère*

IEC 61000-6-2:2016, *Compatibilité électromagnétique (CEM) – Partie 6-2: Normes génériques – Norme d'immunité pour les environnements industriels*

IEC 61000-6-3:2006, *Compatibilité électromagnétique (CEM) – Partie 6-3: Normes génériques – Norme sur l'émission pour les environnements résidentiels, commerciaux et de l'industrie légère*
IEC 61000-6-3:2006/AMD1:2010

IEC 61000-6-4:2018, *Compatibilité électromagnétique (CEM) – Partie 6-4: Normes génériques – Norme sur l'émission pour les environnements industriels*

IEC 62135-1:2015, *Matériels de soudage par résistance – Partie 1: Exigences de sécurité pour la conception, la fabrication et l'installation*

ISO 669:2016, *Soudage par résistance – Matériel de soudage par résistance – Exigences mécaniques et électriques*

CISPR 11:2015, *Appareils industriels, scientifiques et médicaux – Caractéristiques de perturbations radioélectriques – Limites et méthodes de mesure*
CISPR 11:2015/AMD1:2016
CISPR 11:2015/AMD2:2019

CISPR 16-1-1:2019, *Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Partie 1-1: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Appareils de mesure*

CISPR 16-1-2:2014, *Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Partie 1-2: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Dispositifs de couplage pour la mesure des perturbations conduites*
CISPR 16-1-2:2014/AMD1:2017

CISPR 16-1-4:2019, *Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Partie 1-4: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques – Antennes et emplacements d'essai pour les mesures des perturbations rayonnées*