

ICS 25.180.10

CCS K 61



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 5959.11-2016

Replacing GB 5959.11-2000

**Safety in electroheat installations -- Part 11: Particular
requirements for installations using the effect of
electromagnetic forces on liquid metals**

(English Translation)

Issued on: February 24, 2016

Implemented on: September 1, 2016

Issued by: Standardization Administration of China

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Foreword

"Safety of electric devices" has the following 13 sections.

--- Part 1. General requirements;

--- Part 2. Particular requirements for arc furnace apparatus;

--- Part 3. Particular requirements for induction and conduction heating and induction melting apparatus means;

--- Part 4. Particular requirements for resistance heating apparatus;

--- Part 41. Particular requirements for resistance heating equipment --- glass heating and melting apparatus;

--- Part 5. Particular requirements for plasma unit;

- Part 6. Industrial microwave heating equipment safety regulations;
- Part 7. A device having an electron gun of special requirements;
- Part 8. Particular requirements for electrosag remelting furnaces;
- Part 9. Particular requirements for high-frequency dielectric heating apparatus;
- Part 10. Particular requirements for industrial and commercial use resistive heating system;
- Part 11. Particular requirements for liquid metal electromagnetic force device;
- Part 13. Electric apparatus for explosive atmosphere of special requirements.

In addition to this series, Part 13 standard, but are used IEC 60519 "Safety of electric devices" each part of the development of corresponding.

This is Part 11.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This Part replaces GB 5959.11-2000 "Safety - Part 11 Electric equipment. The liquid metal electromagnetic stirring, transport or pouring of the special requirements of the device", compared with GB 5959.11-2000 The main changes are as follows.

- Standard Applies from "liquid metal electromagnetic stirring, transport or pouring" to "liquid metal electromagnetic force means";
- Normative references added GB/T 3984.1-2004, CISPR11, IEC 60143-1:2004, delete GB 5959.3;
- To increase the high power level sensor yoke requirements;
- A sudden increase in power outages, prevent liquid metal splash hazard requirements;
- Remove inductor current, voltage requirements (see 2000 version 3.5);
- Remove the power supply cable design requirements (see the 2000 version 3.7);
- Deletion of the mobile sensor electromagnetic field requirements (see the 2000 version 3.9);
- Simplifies the solution was cooled capacitor requirements;
- Remove the capacitor temperature monitoring alternative provisions (see the 2000 version of the 4.6, 4.7);
- "Commercial power supply" in the supplement to the parallel resonance requirement;
- Delete "electric generator frequency conversion unit" chapter (see Chapter 6, 2000);
- "Electronic inverter device" with "solid state drive" increased "energy storage harm"

requirement;

- Delete "ferromagnetic multiplier" chapter (see Chapter 8 edition 2000);
- Modify the design requirements of the switching device;
- On the "cables, wires and busbars" interconnector increase "Design should be taken to avoid excessive internal over-flow";
- On the "liquid cooling" increase "should consider the possibility of causing the pressure switch valve surge";
- "Nameplate" adds RF equipment requirements;
- Delete "shock protection," in direct contact and continuous contact allowed contact voltage vs. frequency for the note (see the 2000 version 14.2.1 and 14.1.1);
- Delete "indirect contact protection," the "should be used to protect the star point grounding or ground protection measures" (see the 2000 version 14.2.3);
- "Ground provisions", the supplement without detecting a ground wire on the current situation and armored cable, conduit or tube through a third grounding voltage cabinet high-voltage circuit section when the request to the second voltage section.

This section uses the translation method identical with IEC 60519-11:2007 "Safety of electric devices - Part 11. A liquid metal electromagnetic force means special requirements" (second edition, in English).

Consistency correspondence between this part of international documents and normative references of our files are as follows.

- GB 4824 industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement (GB 4824-2013, CISPR11:2010, IDT);
- GB/T 6115.1-2008 Series capacitors for power systems - Part 1. General (IEC 60143-1:2004, MOD).

This part is proposed by the China Electrical Equipment Industrial Association.

This part of the National Electric Equipment Industry Standardization Technical Committee (SAC/TC121) centralized.

This section is drafted. Xi'an Institute Ltd. furnace, Metallurgical Engineering Technology Center, the State Quality Supervision and Inspection Center Furnace, Shaanxi electric engineering technology research center.

1 Scope

This section GB/T 5959 applies to the electromagnetic force based on liquid metal effect, comprising.

- Low Frequency Electromagnetic liquid metal (induction) stirring or conveying means;
- In the casting process of magnetic fields affect the device;
- Member directly affected by electromagnetic stirring, transport or pouring device impacts.

Application examples.

- Casting machine, electric arc furnace, ladle like stirring means;
- For filling or emptying of the furnace, conveyor chute or mold of liquid metal;
- Quantitative liquid metal delivery means, such as die-casting machine filling;
- During casting by electromagnetic fields on the surface of the ingot or casting stream to enhance crystallization;
- Melting vessel mechanical seal gap, for example, for vertical galvanizing line.

This section includes.

- General requirements for liquid metal electromagnetic force device;
- Electromagnetic casting equipment Particular requirements (Appendix A);
- Lining the special requirements of having an electromagnetic device (Appendix B).

NOTE: When this section in conjunction with GB 5959.1-2005, the term "electric device" or "electric equipment" should be replaced by "liquid metal electromagnetic force means."

2 Normative references

The following documents for the application of this document is essential. For cited documents with dates, only the dated edition applies to this document. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 2900.23-2008 Electrotechnical terminology industrial electric equipment (IEC 60050-841:2004, IDT) GB/T 3984.1-2004 Power capacitors for induction heating installations - Part 1. General (IEC 60110-1:1998, IDT) GB 5959.1-2005 Safety of electric devices - Part 1. General requirements (IEC 60519-1:2003, IDT) GB 4-41 Part 16895.21-2011 low voltage electrical devices. safety Protection against electric shock (IEC 60364-4-41:2005, IDT) IEC 60143-1:2004 Series capacitors for power systems - Part 1. General CISPR 11 Industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement