

Translated English of Chinese Standard: GB/T3805-2008

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 13.260

K 09

GB/T 3805-2008

Replacing GB/T 3805-1993

Extra-low voltage (ELV) - Limit values

特低电压（ELV）限值

Issued on: January 22, 2008

Implemented on: September 01, 2008

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine;
Standardization Administration of the People's Republic of China.**

Table of Contents

Foreword.....	3
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 General.....	6
5 Environmental situations	7
6 Voltage limits	7
7 Special applications	9
Appendix A (Informative) Factors affecting voltage limits	12
References.....	15

Extra-low voltage (ELV) - Limit values

1 Scope

This Standard gives guidance on the selection of voltage classes within Band I, as defined in GB/T 18379, for conductive parts that may be touched by human beings in various applications and environmental situations under both normal and fault conditions.

After taking into account the significant factors, professional standardization technical committees may select voltage limit values other than those given in this Standard, if it is shown by experience that a reasonable safety level can be achieved.

Voltage classes for patient contact in medical applications are not covered by this Standard.

This Standard does not include any reference to insulation systems or to methods of protection. The conventional touch voltage limit value as defined in IEC 60050-826 for the purpose of automatic disconnection of the supply is not within the scope of this Standard.

2 Normative references

The terms in the following documents become the terms of this Standard by reference to this Standard. For dated references, all subsequent amendments (not including errata content) or revisions do not apply to this standard. However, parties to agreements that are based on this Standard are encouraged to study whether the latest versions of these documents can be used. For undated references, the latest edition applies to this Standard.

GB 16895.21-2004, Electrical installations of buildings - Part 4-41: Protection for safety - Protection against electric shock (IEC 60364-4-41:2001, IDT)

GB/T 18379-2001, Voltage bands for electrical installations of buildings (IEC 60449:1973, IDT)

GB/T 13870.1-1992, Effects of current passing through the human body - Part 1: General aspects (Chapter 3: Effect of 15 ~ 100 Hz sinusoidal alternating current; Chapter 4: Effect of DC current; Chapter 5: Electrical impedance of the human body (neq IEC 60479-1:1984)

GB/T 13870.2-1997, Effects of current passing through the human body - Part 2: Special aspects (Chapter 4: Effect of alternating current with a frequency above 100

Hz; Chapter 5: Effect of special waveform currents; Chapter 6: Effect of short-term unidirectional pulse currents) (IDT IEC 60479-2:1987)

GB/T 12113-2003, Methods of measurement of touch current and protective conductor current (IEC 60990:1999, IDT)

IEC 60050-826, International Electrotechnical Vocabulary - Chapter 826: Electrical installations of buildings

3 Terms and definitions

The following terms and definitions are applicable to this Standard.

3.1

grippable part

A part which, if it were to supply a sufficiently large current through the human hand, would cause muscular contraction and inability to let go.

Note: Parts which are intended to be gripped with the entire hand are assumed to be grippable without further investigation. See GB 12113-2003 for a full description of “grippable part”.

3.2

touch current

The electric current passing through the human body or animal body when a person or animal comes into contact with one or more accessible parts of equipment.

[IEV 195-05-21]

3.3

touch voltage

The voltage with the conductive parts when a person or animal comes into contact with the conductive parts.

[IEV 195-05-11]

4 General

The values given in this Standard are based on GB/T 13870.1-1992 and GB/T 13870.2-1997, as well as experience from other sources. The regulation of the voltage limits is given for both normal and fault conditions. These limits are not related to the concepts

of direct and indirect contact, nor are they used to distinguish between grounded and ungrounded circuits. Voltages up to the limit values can be considered as non-hazardous to the human body under the specified conditions.

The voltage limits specified in this Standard refers to the voltage limits for power supplied by a power source whose internal impedance is much lower than that of the human body. For other sources, touch current limits not covered by this Standard may apply. The voltage limits stated apply to the highest voltages that can exist between two simultaneously accessible parts (with all external factors, such as mains voltage tolerance, in their least favorable condition). Factors affecting voltage limits are listed in Appendix A.

5 Environmental situations

For the purposes of this Standard, the effects of the following situations are taken into account:

Environmental situation 1: Both the impedance of skin and the resistance to ground are negligible (e.g., human immersed condition);

Environmental situation 2: The impedance of skin and the resistance to ground are reduced (e.g., wet conditions);

Environmental situation 3: Both the impedance of skin and the resistance to ground are not reduced (e.g., dry conditions);

Environmental conditions 4: Special situation (e.g., electric welding, electroplating). The definition of special situation shall be stipulated by relevant professional standardization technical committees.

6 Voltage limits

The voltage limits specified in this Standard are conservative for contact areas not greater than 80 cm². Higher limits are specified for the case of small contact areas with alternating currents with a frequency not greater than 100 Hz. However, no data is available for higher frequencies or for the DC case.

Voltage limits for AC are sinusoidal waveform root mean square values (r.m.s).

Voltage limits for DC are the ripple-free DC voltage, which is usually a DC whose root-mean-square value of the ripple content is not greater than 10%. For example: for a 120 V ripple-free DC system, the peak value does not exceed 137 V.

6.1 Steady-state limits

Appendix A

(Informative)

Factors affecting voltage limits

Factors marked with “*” have been taken into account in the preparation of this Standard, and have played a role in determining the voltage limit in this Standard. The professional standardization technical committees shall take all these factors into consideration.

A.1 Human body impedance

- touch voltage;
- humidity of the skin;
- current path;
- contact area;
- contact pressure;
- waveform/frequency.

A.2 Accessible parts

- contact area (fingertip, finger, hand);
- grippability;
- location of the accessible part;
- intentional/unintentional touch.

A.3 Electrical system

- AC/DC;
- waveform, frequency, single pulse;
- reference point grounding and floating grounding;
- separation from other systems;
- source impedance;
- tripping device;

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 3 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

3. <https://www.google.com/search?tbm=bks&q=ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Google Books -- Select your currency.
- Processed by Google (delivery, tax invoice etc.). Delivered in 9 seconds by Google.
- Tips: Download an unprotected **True-PDF** (text-editable) from Google-Books:
 1. <https://play.google.com/books> → 2. Sign in → Google account
 3. Find the **BOOK** you bought → 4. Click "3-dots" → Export
 5. Save as "*.pdf" (Save True-PDF to your local computer for offline reading/printing)

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

Accountable person and shareholder: Wayne Zheng

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----