ICS 17.200; 31.030

CCS N05

JB

Mechanical Industry Standard of the People's Republic of China

JB/T 8901-2025

Replaces JB/T 8901-1999

Sheathed noble metal thermocouple cables

Issued: September 9, 2025

Effective: March 1, 2026

Ministry of Industry and Information Technology Issued

Table of Contents

Foreword

This document is drafted in accordance with the provisions of GB/T 1.1—2020 Directives for standardization — Part 1: Structure and drafting rules of standardization documents.

This document replaces JB/T 8901—1999 Sheathed noble metal thermocouple cables.

Compared with JB/T 8901—1999, besides structural adjustments and editorial modifications, the main technical changes are as follows:

a) Added technical requirements and test methods for PtRh30-PtRh6 sheathed thermocouple cables (see 4.1, 4.3.2, 4.4, 5.3, 6.3);

b) Added technical requirements and test methods for PtRh40-PtRh20 sheathed thermocouple cables (see 4.1, 4.3.2, 4.4, 5.3, 6.3);

c) Modified the selected materials (see 4.3; Appendix A of the 1999 edition);

d) Added dimensions for four-core sheathed noble metal thermocouple cables (see 5.1);

e) Modified the tolerance classes (see 5.3; Clause 5.4 of the 1999 edition);

f) Modified the requirements for insulation resistance (see 5.4; Clause 5.5 of the 1999 edition);

g) Added requirements and test methods for electric strength (see 5.5, 6.5);

h) Added requirements and test methods for electrical continuity (see 5.8, 6.8).

Attention is drawn to the possibility that some contents of this document may involve patents.

The issuing body of this document shall not be responsible for the identification of such patents.

This document is proposed by China Machinery Industry Federation.

This document is administered by the National Technical Committee for Functional Materials for Instruments Standardization (SAC/TC419).

Leading drafting organizations of this document:

Chongqing Materials Research Institute Co., Ltd.,

Chongqing Chuanyi No.17 Factory Co., Ltd.,

Anhui Tiankang (Group) Co., Ltd.,

Henan University of Science and Technology,

Ningbo Aoqi Automation Instrument Equipment Co., Ltd.,

Xinguo Group Co., Ltd.,

Chongqing Dazheng Instrument Co., Ltd.,

Zhejiang Taisuo Technology Co., Ltd.,

Anhui Huining Electrical Instrument Group Co., Ltd.,

Anhui Lande Group Co., Ltd.,

Chongqing Diyang Instrument Co., Ltd.,

Shenzhen Chengtiantai Cable Industrial Development Co., Ltd.

Main drafters of this document:

Wu Baoan, Zhang Chi, He Lunying, Wei Dan, Mao Wenzhang, Song Kexing, Tang Huiyi, Wang Yunchun, Sun Jiong, Qin Youguo, Zhou Hongqin, Xiao Yuchen, Zheng Yawen, Shi Jianhua, Chen Xingguo, Zong Cuimei, Dai Wei, Peng Ya, Chen Shangjing, Tian Yuan.

History of previous editions of the standard replaced by this document:

—— JB/T 8901—1999

Sheathed noble metal thermocouple cables

1 Scope

This document specifies the product classification and technical requirements for sheathed noble metal thermocouple cables, describes the corresponding test methods, and stipulates the delivery method, packaging and quality certification documents.

This document applies to the manufacture of sheathed thermocouple cables whose thermoelements are PtRh10-Pt (Type S), PtRh13-Pt (Type R), PtRh30-PtRh6 (Type B) and PtRh40-PtRh20.

2 Normative References

The contents of the following documents constitute indispensable provisions of this document by normative reference in the text.

For dated references, only the edition cited applies.

For undated references, the latest edition of the referenced document (including all amendments) applies.

GB/T 1598

Platinum-rhodium 10-platinum, platinum-rhodium 13-platinum and platinum-rhodium 30-platinum-rhodium 6 thermocouple wires

GB/T 16839.1

Thermocouples — Part 1: Electromotive force specifications and tolerances

GB/T 36010

Platinum-rhodium 40-platinum-rhodium 20 thermocouple wires

JB/T 8205

Base metal sheathed thermocouple cables

3 Terms and Definitions

The terms and definitions given in JB/T 8205 and the following apply to this document.

3.1 sheathed noble metal thermocouple cables

A flexible solid composite manufactured by insulating one or more pairs of PtRh10-Pt (Type S), PtRh13-Pt (Type R), PtRh30-PtRh6 (Type B) and PtRh40-PtRh20 thermocouple wires with mineral insulating material, enclosing them in a metal sheath, and compacting the assembly.

4 Product Classification

4.1 Product name, type and thermocouple type designation

The product names, types and thermocouple type designations are given in Table 1.

Table 1 Product Name, Type and Thermocouple Type Designation

Product Name	Type	Thermocouple Type Designation
Sheathed PtRh10-Pt thermocouple cable	KS	S
Sheathed PtRh13-Pt thermocouple cable	KR	R
Sheathed PtRh30-PtRh6 thermocouple cable	KB	B
Sheathed PtRh40-PtRh20 thermocouple cable	–	–

4.2 Number of Thermoelement Cores

For noble metal sheathed thermocouple cables (hereinafter referred to as cables) with an outer diameter of less than 3.0 mm, they may be manufactured as two-core cables using one pair of thermocouple wires.

Cables with an outer diameter of 3.0 mm or more may be manufactured as two-core cables using one pair of thermocouple wires, or as four-core thermocouple cables using two pairs of thermocouple wires.

4.3 Materials

4.3.1 Sheath

Heat-resistant superalloys such as GH3039 and GH3030, as well as platinum-rhodium alloys such as PtRh6, PtRh10 and PtRh20 may be used as sheath materials.

Other materials may also be adopted.

4.3.2 Thermoelements

Thermocouple wires specified in GB/T 1598 shall be used for Type S, Type R and Type B cables.

Thermocouple wires specified in GB/T 36010 shall be used for PtRh40-PtRh20 cables.

4.3.3 Insulation

The insulation consists of compacted inorganic compounds.

Magnesium oxide (MgO) with a purity of not less than 96 % or aluminum oxide (Al_2O_3) with a purity of not less than 99.65 % as specified in JB/T 8205 may be used.

4.4 Recommended Maximum Operating Temperature

The recommended maximum operating temperature depends on the cable type, sheath material and outer diameter, as shown in Table 2.

Table 2 Recommended Maximum Operating Temperature

Type	Sheath Material	Outer Diameter (D) mm	Recommended Maximum Operating Temperature ℃
KS	GH3030, GH3039, PtRh10	D ≤ 1.5	800
		1.5 < D ≤ 3.0	900
		3.0 < D ≤ 5.0	1000
		D > 5.0	1100
KR	GH3030, GH3039, PtRh6, PtRh10, PtRh20	D ≤ 1.5	800
		1.5 < D ≤ 3.0	900
		3.0 < D ≤ 5.0	1000
		D > 5.0	1100
KB	PtRh6, PtRh10, PtRh20	D ≤ 3.0	1200
		3.0 < D ≤ 5.0	1300
		5.0 < D ≤ 6.0	1400
		D > 6.0	1500
Sheathed PtRh40- PtRh20 thermocouple cable	PtRh20	D ≤ 3.0	1400
		3.0 < D ≤ 5.0	1500
		D > 5.0	1600

4.5 Marking

The product shall be marked in accordance with the following format:

KR-4-GH3030-φ5.0-II-JB/T 8901-XXXX

The meanings of each element in the marking are as follows:

- KR — Product type;
- 4 — Number of cable cores (omitted for two-core, marked as 4 for four-core);
- GH3030 — Outer sheath material;
- φ5.0 — Outer diameter of the cable;
- II — Tolerance class (Class II, Class III);
- JB/T 8901-XXXX — Standard number.

5 Technical Requirements

5.1 Dimensions

The schematic cross-section of two-core cable is shown in Figure 1.

The typical dimensions of the cable shall comply with the provisions of Table 3.

Other dimensions may also be adopted.