SIC
重庆川仪

# WR 系列热电偶

使用说明书

# WR Series Thermocouple

**Operation Instructions**



重庆川仪十七厂有限公司

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

# 特 别 提 示

# Particular Notes

**本说明书仅限于下列产品使用：**

**The Instructions is restricted to be applied in the following products:**

WR□装配热电偶

WR□ thermocouple assembly

WRG□K 铠装热电偶

WRG□K sheathed thermocouple

WR□K 铠装芯装配式热电偶

WR□K core-sheathed thermocouple assembly

WR□□L-耐磨（耐腐蚀）热电偶

WR□□L - wear-resisting (corrosion resistance) thermocouple

WR□□K-耐磨（耐腐蚀）热电偶

WR□□K- wear-resisting (corrosion resistance) thermocouple

WR□□Q-耐磨（耐腐蚀）热电偶

WR□□Q- wear-resisting (corrosion resistance) thermocouple

WR□KS 铠装多点热电偶

WR□KS sheathed multipoint thermocouple

WR□KM 铠装多支热电偶

WR□KM sheathed multi-branch thermocouple

WR□KT-TS 提升管反应器抗冲刷热电偶

WR□KT-TS anti-erosion thermocouple for riser reactor

WR□KC-COT 乙烯裂解炉插入式热电偶

WR□KC-COT inserted thermocouple for ethylene cracking furnace

WR□KB-COT 乙烯裂解炉表面热电偶

WR□KB-COT surface thermocouple for ethylene cracking furnace

WR□KH 高压加氢反应器（带测漏装置）多点热电偶

WR□KH multipoint thermocouple for high-pressure hydrogenation reactor (with leak detection devices)

WR□KR 甲烷化反应器专用多点热电偶

WR□KR methanator-dedicated multipoint thermocouple

MR□K□防热辐射热电偶

MR□K□ thermal radiation proofing thermocouple

MP□K□防热辐射抽气式热电偶

MP□K□ thermal radiation proofing and suction thermocouple

WR□T-RF 高炉热风炉专用热电偶

WR□T-RF blast furnace hot blast stove-dedicated thermocouple

HO□K 玻璃窑炉铂金套管铠装热电偶

HO□K platinum sleeve sheathed thermocouple for glass furnace

WR□-T□GL 玻璃窑炉刚玉保护管热电偶

WR□-T□GL corundum-tube thermocouple for glass furnace

WR□-F□GL 玻璃窑炉刚玉保护管热电偶（接插件式）

WR□-F□GL corundum-tube thermocouple for glass furnace (plug-in type)

WR□-P□GL 玻璃窑炉铂金保护管热电偶（接线盒式）

WR□-P□GL platinum-tube thermocouple for glass furnace (junction box type)

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# 使用说明书

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**警告！**

**Warning!**

1. 安装使用前，请认真阅读本使用说明书；
1. Please carefully read the Instructions before installation and use;
2. 隔爆产品严禁带电条件下开盖；
2. Strictly prohibit uncovering any electrified explosion-proof products;
3. 本产品技术规范可能发生改变，恕不另行通知。
3. Changes may happen on the Product Technical Specification,



## 1. 概述

## 1. Overview

装配热电偶通常由感温元件、保护管、接线盒及安装固定装置等主要部件组成。

Thermocouple assembly generally mainly consists of temperature sensing components, protective tubes, junction boxes and fixedly installed devices etc.

本产品执行标准:

Executive standard of the product:

GB/T30429-2013《工业热电偶》。

GB/T30429-2013 *Industrial Thermocouple Assemblies*

铠装热电偶是新型的温度传感器，具有体形细长、热响应快、抗振动、耐高压、使用寿命长以及便于弯曲等优点。

Sheathed thermocouple, a new type of temperature sensor, has multiple advantages such as long and thin shape, rapid thermal response, vibration resistance, high pressure resistance, long service life and flexibility.

本产品执行标准:

Executive standards of the product:

GB/T18404-2001《铠装热电偶电缆及铠装热电偶》；

GB/T18404-2001 *Mineral Insulated Thermocouple Cables and Thermocouples*

JB/T8205-1999 《廉金属铠装热电偶电缆》。

JB/T8205-1999 *Sheathed Base Metal Thermocouple Cables*

**2. 分度表及允差**

**2. Reference Table and Tolerance**

热电偶分度表及允差执行标准：

Executive standards of thermocouple reference table and tolerance:

GB/T 16839.1-1997 《热电偶 第 1 部分：分度表》

GB/T 16839.1-1997 *Thermocouples Part 1: Reference Tables*

GB/T 16839.2-1997 《热电偶 第 2 部分：允差》

GB/T 16839.2-1997 *Thermocouples Part 2: Tolerances*

## 3. 热响应时间

## 3. Thermal Response

3.1 装配热电偶的热响应时间

3.1 Thermal response time of thermocouple assembly

表 1 装配热电偶的热响应时间

Table 1 Thermal response time of thermocouple assembly

| 保护管直径（mm） | 保护管材质 | 热响应时间$\tau_{0.5}$（s） |
|---|---|---|
| Φ16 | 非金属 | ≤240 |
| | 金属 | ≤180 |
| Φ20 | 金属 | ≤240 |
| Φ25 | 非金属 | ≤300 |

| Diameter of protective tube (mm) | Material of protective tube | Thermal response time $\tau_{0.5}$ (s) |
|---|---|---|
| Φ16 | Nonmetal | ≤240 |
| | Metal | ≤180 |
| Φ20 | Metal | ≤240 |
| Φ25 | Nonmetal | ≤300 |



3.2 铠装热电偶的热响应时间

3.2 Thermal response time of sheathed thermocouple

表 2 铠装热电偶的热响应时间

Table 2 Thermal response time of sheathed thermocouple

| $\tau_{0.5,s}$ 测量端 | 铠装热电偶直径（mm） | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.25 | 0.5 | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 4.5 | 5.0 | 6.0 | 8.0 |
| 露端型 | — | — | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 1.0 |
| 接壳型 | 0.1 | 0.2 | 0.2 | 0.3 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 2.0 | 4.0 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 绝缘型 | 0.1 | 0.4 | 0.6 | 0.8 | 1.0 | 2.0 | 2.5 | 3.0 | 4.0 | 6.0 | 8.0 |

| $\tau_{0.5,s}$ Measuring end | Sheathed thermocouple diameter (mm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.25 | 0.5 | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 | 4.5 | 5.0 | 6.0 | 8.0 |
| Exposed junction type | — | — | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 1.0 |
| Shorted junction type | 0.1 | 0.2 | 0.2 | 0.3 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 2.0 | 4.0 |
| Isolated junction type | 0.1 | 0.4 | 0.6 | 0.8 | 1.0 | 2.0 | 2.5 | 3.0 | 4.0 | 6.0 | 8.0 |

## 4. 适用环境

## 4. Application environment

4.1 防护等级

4.1 Protection grade

热电偶接线盒防护等级为 IP66/IP68。

Protection grade of thermocouple junction box is IP66/IP68.

4.2 非防爆产品

4.2 Non-explosion insulation product

- 热电偶参比端（接线盒外）的温度一般不应超过 100℃，并保持其稳定不变。
- Temperature of thermocouple (thermocouple) reference junction (on the exterior of junction box) should not exceed 100 ℃ and keep stable and invariant.
- 应避免装在炉门旁边或与加热物体距离过近及具有强磁场之外，热电偶的热线盒不可碰到被测介质的容器壁。

- In addition to avoid being installed on the side of fire door or being close to heating objects as well as having high-intensity magnetic field, Thermocouple junction box should not contact container wall of mediums measured.

4.2 防爆产品

4.2 Explosion insulation product

通常情况下，防爆电气设备使用的环境温度为-20～+40℃。

In general, electric apparatus for explosive atmospheres should be used under -20～+40℃ environmental temperature.

**5. 安装使用要求**

**5. Installation and use requirements**

5.1 非金属保护管产品

5.1 Products with non-metal protective tubes

凡具有非金属保护管的产品在安装使用时应注意：

For any products with non-metal protective tubes, when installing and use, attentions should be attached to:

- 保护管易碎，杜绝碰撞。
- Fragile protective tubes are definitely allowed to be collided.
- 搬运、安装以及拆卸时应轻拿、轻放，避免跌落或硬物碰撞
- 造成保护管断裂。
- When handling, installation and disassembly, it should take and put gently to avoid collision protection tube rupture by hard objects.

在安装时应遵循以下步骤：

It should abide by the following steps for installation:

- 产品安装时应沿设备安装孔顺向安装，避免产品保护管与设备安装孔内壁接触而造成产品保护管的破损以致产品无法正常使用。
- Product installation shall be installed along the downstream equipment installation hole and avoid the contact between products protective pip wall and equipment installation hole to damage to product protection tube, and which causes products cannot be normally used.
- 若设备内部温度小于 500℃，产品可直接插入设备中或直接从设备中拆卸。
- If the internal temperature of the equipment is less than 500 ℃, the product can be directly inserted into the device or remove directly from the device.
- 若设备内部温度大于 500℃，产品安装时，先将产品热端插入设备温度为 500℃（产品接入便携式测温计）的位置停留不少于 5 分钟，然后按每 5 分钟插入 50～100mm 的速度将产品缓慢插入设备中即可。
- If the equipment internal temperature greater than 500 ℃, while product installation, first the heating end of product should be inserted into the device under 500 ℃ (product portable thermometer) for not less than five minutes, and then slowly insert the product at the slow speed 50 to 100 mm rate for every 5 minutes into the device.
- 若设备内部温度大于 500℃，产品拆卸时，从设备中抽出产品的过程一定要缓慢，按每 5 分钟 50～100mm 的速度将产品缓慢取出，否则会因为非金属管的温度急剧变化而产生炸裂。切忌抽出后直接放到地面上。

- If the internal temperature of the device is greater than 500 ℃, when dismantling products, the process of draining products from the equipment must be slow and slowly remove the products at the rate of 50 ~ 100 mm per 5 minutes; otherwise, non-metallic pipe may be broken due to rapid changes in temperature. By all means, avoid directly putting on the ground after taking out .

5.2 安装注意事项

5.2 Installation notes

- 铠装热电偶测量表面温度时，必须尽量使测量端贴紧被测物体表面，以保持良好的热接触，减少测量误差。
- When measuring the surface temperature of armoured thermocouple, try to make measuring ends post on the measured body surface in order to keep good thermal contact and reduce the measurement error.
- 固定卡套螺纹在安装时，务必在调整好所需的插入深度后，立即加以拧紧，以确保达到耐压密封而又不损坏的要求。**卡套螺栓在首次使用时，插入深度是可调的。一旦拧紧，插深则不再可调。**
- When installing fixed and adjustable thread joints, be sure to immediately tighten it after adjusting the inserted depth to ensure to achieve the requirement of the pressure sealing without damage. **Inserted depth is adjustable when using thread bolts for the first time. Once tightening, the depth is no longer adjustable.**
- NPT系列及ZG系列等锥螺纹在现场使用时，应加强对螺纹连接处的密封处理，如缠绕生胶带或涂覆密封胶。

- When taper threads of NPT, ZG and other series are used on the spot, sealing treatment of thread joints should be strengthened, such as wrapping raw tape or coating sealant.

**6. 防爆产品要求**

**6. Requirements on explosion proof products**

6.1安装场所中气体、蒸汽、薄雾状易燃物质的级别不得高于产品铭牌中所规定的级别，运行时接线盒、保护管和固定装置等任何暴露于爆炸性混合物部分的表面温度不得超过产品铭牌中所规定的温度级别。

6.1 Levels of gas, steam, mist shape inflammable materials on installation spot shall not exceed that stipulated in product nameplate. The surface temperature of any part exposed to explosive mixture during operation, including junction box, protective tube, fixed device and so on, shall not exceed temperature levels stipulated in the product nameplate.

- 隔爆型热电偶在可氧化性或中性气氛中使用，但不适用于强烈氧化气氛。
- Explosion insulation thermocouple can be used under oxidizable or neutral atmosphere but not to be suitable for strong oxidizing atmosphere.
- 使用隔爆型热电偶时必须选用相匹配的补偿导线，并注意补偿导线与热电偶极性相一致。
- During operation of explosion insulation thermocouple, matched compensating lead wire must be selected, which shall conform to the polarity of thermocouple.

6.2 隔爆型热电偶（**防爆标志"Ex d ⅡC T6 Gb"**）只能用于爆炸性气体环境，且限于1区、2区危险场所，不能在0区使用。

6.2 Explosion insulation thermocouple (**explosion sign "Ex d ⅡC**

**T6 Gb")** shall be only used for explosive gas environment. Moreover, it is limited to be used in hazardous locations of Area 1 and Area 2 and cannot be used in Area 0.

粉尘防爆型热电偶（**防爆标志"Ex t ⅢC Db"**）只能用于可燃性粉尘环境，且限于21区、22区危险场所，不能在20区使用。

Dust explosion isulation thermocouple **"explosion sign Ex t ⅢC Db"** shall be only used for combustible dust environment. Moreover, it is limited to be used in hazardous locations of Region 21 and Region 22 and cannot be used in Region 20.

**防爆产品使用时，应符合相应防爆等级的有关规定。**

**Any explosion insulation products shall comply with the relevant regulations on explosion insulation grades when using.**

6.3 现场使用时，接线盒的盖子须在切断电源后方可开盖。

6.3 During on-site installation, any junction boxes cannot be uncovered unless being cut off in advance.

6.4 必须防止热流引爆。

6.4 It requires preventing thermal flow detonation.

6.5 对隔爆外壳材质有明显腐蚀的地方不能使用。

6.5 Any places that are obviously capable of corrosive effects on explosion insulation shell materials are not allowed to use.

6.6 补偿导线应为隔爆阻燃型电缆。

6.6 Compensating lead wires should adopt explosion and flame insulation cables.

6.7 各连接件应保护连接可靠。

6.7 It must make sure reliable protective connections of various fastenings.

6.8 外接地端子必须可靠接地。

6.8 External grounding terminals are required of reliable earthing.

6.10 安装场所存在可燃性气体的温度组别与产品使用中外露部分最高表面温度均应符合下表参数：

6.10 Temperature grading groups of combustible gases in installation site and the maximum surface temperature of product exposed parts during use shall be in consistence with the parameters stated in the table below:

表 3 产品外露部分最高表面温度

Table 3 Maximum surface temperature of product exposed parts

| 温度组别 | T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|
| 允许最高表面温度 | 440℃ | 290℃ | 195℃ | 130℃ | 95℃ | 80℃ |

| Temperature class | T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|
| Tolerable maximum surface temperature | 440℃ | 290℃ | 195℃ | 130℃ | 95℃ | 80℃ |

6.11 隔爆铭牌应保持清晰、完好、不得丢失。

6.11 All explosion insulation nameplates shall be distinct and complete; make sure safekeeping and no loss is allowed.

6.12 使用过程中严禁拆卸热电偶中的任何部件。

6.12 Strictly prohibit dismantling any components contained in thermocouple during use.

6.13 现场安装必须符合“中华人民共和国爆炸危险场所电气安全规程（试行）”和 GB 3836.15-2000 爆炸性环境用防爆电气设备 第 15 部分-危险场所电气安装（煤矿除外）中有关规定。

6.13 Filed installation shall meet the relevant stipulations in “Rules for electrical safety in explosive hazardous areas of the People’s Republic of China (tentative)” and “GB 3836.15-2000 Electrical apparatus for explosive gas atmospheres--Part 15: Electrical installations in hazardous areas(other than mines)”.

## 7. 接线图

## 7. Wiring Diagram

在接线时，先打开接线盒盖，然后根据图 1 所示接线板种类查找表 2，按表 4 规定的接线规则进行接线。

First, open the junction box covers; then refer to Table 2 according to the wiring board types shown in Fig. 1; finally, conduct wiring operation as per the relevant rules stated in Table 4.

图 1 热电偶接线板

Fig. 1 Thermocouple wiring board

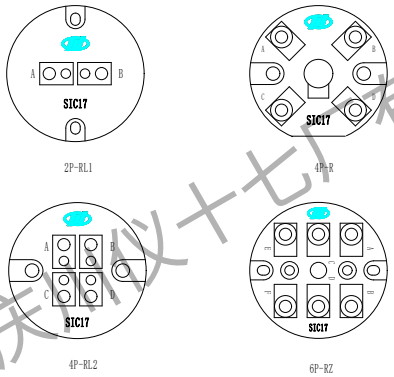




表 4 接线板接线规则

Table 4 Wiring rules for wiring boards

| 产品类别 | 接线板类型 | | | |
|---|---|---|---|---|
| | 4P-R | 6P-RZ | 4P-RL2 | 2P-RL1 |
| 铠偶单支式 | A+D- | C+D- | - | - |
| 铠偶双支式 | A+B-,C+D- | A+E-,F+B- | - | - |

| | | | | |
|---|---|---|---|---|
| 装配偶双支式（廉金属） | - | - | A+B-,C+D- | - |
| 装配偶单支式（廉金属） | - | - | - | A+B- |

| Product category | Type of wiring board | | | |
|---|---|---|---|---|
| | 4P-R | 6P-RZ | 4P-RL2 | 2P-RL1 |
| Single-branch sheathed thermocouple | A+D- | C+D- | - | - |
| Double-branch sheathed thermocouple | A+B-,C+D- | A+E-,F+B- | - | - |
| Double-branch thermocouple assembly **(base metal)** | - | - | A+B-,C+D- | - |
| Single-branch thermocouple assembly **(base metal)** | - | - | - | A+B- |

注：实际使用时未在图 1 和表 4 所示的接线板和接线规则中的接线方式，应根据实际标识进行接线。

Note: In actual practice, in case of wiring modes not be indicated and described in the wiring boards and rules respectively stated in Fig. 1 and Table 4, wiring should be conducted according to the actual marks.

## 8. 典型安装示意图

## 8. Typical Installation Diagram

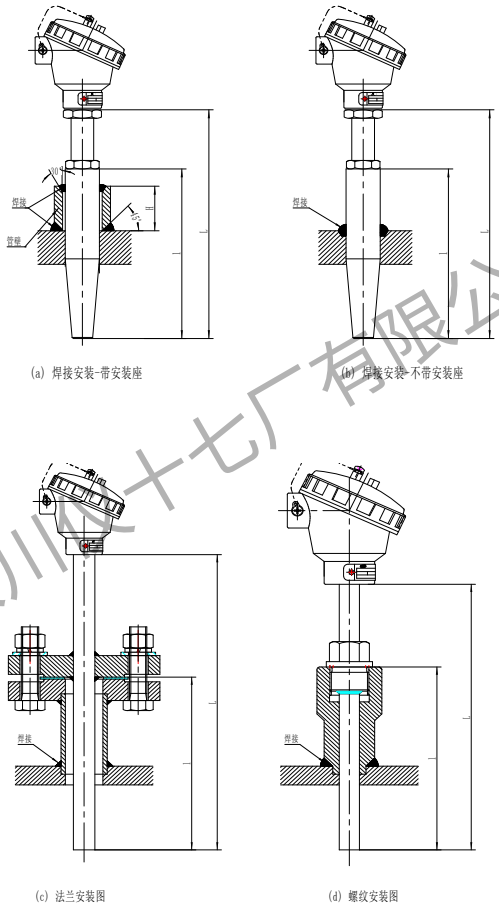




图 2 热电偶典型安装示意图

Fig. 2 Typical installation diagram of thermocouple

注：若安装方式为特殊结构，可来电商榷。

Note: in case of applying special construction as installation mode, please call us for negotiation.

## 9. 维护与修理

## 9. Maintenance and repair

9.1 维护

9.1 Maintenance

9.1.1 带切断阀产品的维护

9.1.1 Maintenance of products with stop valves

- 不得随意关闭切断阀。一旦关闭，热电偶芯即被切断。
- Closing stop valves at will is not allowed. Thermocouple cores will be cut down once closing.
- 带切断阀产品的耐磨头损坏时，应立即将切断阀关闭，即将
- 阀芯旋转 90°。
- If any wear-resisting heads of products with stop valves are damaged, it must immediately close stop valves, e.g. rotate valve cores by 90°.

9.1.2 定期检查

9.1.2 Regular inspection

- 要经常清除隔爆型热电偶外露部分的杂物和易燃物，保持外露部分的清洁，其最高表面温度不得超过相关温度组别中规定的要求。
- It requires frequently clearing foreign articles and inflammables in the exposed positions of explosion insulation thermocouple to keep any exposing parts clean, and the maximum surface temperature shall not exceed the requirements stipulated in the relevant temperature classes.
- 定期检查接线盒盖、引入装置密封塞是否良好；安装是否牢

- 固；防松装置是否有效；接地是否牢靠。
- Regularly check whether the sealing plugs of junction box covers and entry devices are in complete and serviceable conditions; check and confirm fixed installation; check whether anti-loose devices are in effect; make sure reliable grounding.

9.2 修理

9.2 Repair

表 5 热电偶故障现象及修理方法

Table 5 Thermocouple fault phenomena and repair methods

| 序号 | 故障现象 | 可能原因 | 修理方法 |
|---|---|---|---|
| 1 | 热电势比实际应有的小（仪表指示值偏低） | （1）热电偶内部电极漏电（短路）。<br>（2）热电偶接线盒内接线柱短路。<br>（3）热电偶偶丝变质或工作端损坏。 | （1）将热电偶感温元件取出，检查漏电原因，若是因潮湿引起，应将热电偶感温元件烘干，若是绝缘管绝缘不良，则应更换。<br>（2）打开接线盒清洁接线柱，清除造成短路的原因。<br>（3）更换元件。 |
| 2 | 指示仪表无指示 | 热电偶断路 | 更换元件。 |
| 3 | 仪表指示值不稳定（仪表本身无故障的情况下） | （1）接线盒内感温元件和补偿导线接触不良。<br>（2）热电极有断续短路和断续接地现象。（3）热电偶安 | （1）打开接线盒，重新紧固。<br>（2）更换元件。<br>（3）将热电偶牢固安装。 |

| 序号 | 故障现象 | 可能原因 | 修理方法 |
|---|---|---|---|
| | | 装不牢而发生振动。 | |

| No. | Fault phenomenon | Possible cause | Repair method |
|---|---|---|---|
| 1 | Thermoelectric potential is less than the actual competent value (lower indicated value of instrument) | (1) Electric leakage of internal electrode of thermocouple (short circuit)<br>(2) Short circuit on binding post in the junction box of thermocouple | (1) Take out the heat responsive element of thermocouple and check the cause of electric leakage. If it is caused by moist, heat responsive element of thermocouple should be dried; if it is caused by poor insulation of insulation tube, the insulation tube should be changed.<br>(2) Open the junction box and clean the binding post to eliminate the cause leading to short circuit.<br>(3) Replace components. |
| 2 | No indication by instrument | (3) Metamorphism of thermo wire or breakdown of working end of thermocouple. | Replace components |

| No. | Fault phenomenon | Possible cause | Repair method |
|---|---|---|---|
| 3 | Unsteady indicating value from instrument (if no fault of instrument) | (1) Loose contact between temperature sensing components and compensating lead wires inside junction box<br>(2) Intermittent short circuit and grounding of thermode exists.<br>(3) Thermocouple vibration due to unfixed installation. | (1) Open junction box and fasten it.<br>(2) Replace components.<br>(3) Tightly install thermocouples. |

**10. 贮存**

**10. Storage**

热电偶应贮存在周围环境温度 10-35℃，相对湿度不高于 80%，且空气中不含可能使零部件腐蚀的介质中。

Thermocouples should be appropriately stored in 10-35 ℃ surrounding environment temperature with relative humidity less than 80%. Moreover, any mediums that may corrode components should not be contained in the air.

## 11. 补充说明

## 11. Supplementary instructions

11.1产品验收

11.1 Product acceptance

收到本产品后，请及时按产品国家标准或我厂标准规定的出厂检验项目验收。若有质量问题，请于收货之日起一个月内（以用户来函邮戳日期为准）函告我厂，我厂将及时受理。逾期则被视为已验收合格。

After receiving the product, please timely conduct inspection and acceptance in accordance with product national standard and factory inspection items stipulated by our factory. In case of any quality problems, please inform us by letters within one month after the date of receiving (subject to the postmark date of letters from users), and we will approach any issues proposed without delay. Expiry will be regarded as accepted and qualified.

11.2关于热电势测试问题

11.2 Issues on thermoelectrical potential test

热电势是微电压测试，加上外界影响，温度偏差控制诸多因素，毫伏级测试准确十分困难，加之热电偶因有热电势受温度，机械振动等多种条件影响很难做到固定不变。请各位用户在验收时注意几个问题：

Thermoelectrical potential should be conducted micro-voltage test in addition to multiple factors including external influences and temperature deviation control etc. and all of which cause much difficulties in precise mV test; besides, the tested values are changeable to various condition such as temperature and mechanical vibration. Users should pay more attention to the following several problems while conducting inspection and acceptance:

（1）采用相应等级标准监测温度；

(1) Adopt standard supervising temperature at corresponding levels;

（2）标准偶与被测偶的测量端必须在同一等温区；

(2) The measuring ends of standard couple and tested couple must lie in a same isothermal region;

（3）保证足够的浸入深度；

(3) Ensure adequate immersion depth;

（4）避免因绝缘体或保护管污染和漏电造成测试误差；

(4) Avoid those test errors caused by contamination of insulator or protective tubes and electricity leakage;

（5）测试时必须温度稳定；

(5) It requires maintaining a constant temperature during test;

（6）标准偶与被测偶参比端置于同一冰点；

(6) Reference ends of standard couple and measured couple should be placed in a same freezing point;

（7）连接相同等级的补偿导线。

(7) Use compensating lead wires at the same grade for connection.

11.3 我公司提供的包装物有可能对贵方的环境造成影响，请妥善处理。

11.3 Please properly dispose the packaging materials supplied by our company that may influence the environment.

**12. 附表**

**12. Annexed Table**

爆炸性气体分级、分组举例表：

Example Table of Grading and Grouping of Explosive Gases:

| 类和级 | | | ⅡA | ⅡB | ⅡC |
|---|---|---|---|---|---|
| 引 | T1 | T＞450 | 乙烷、丙烷、丙酮、苯 | 二甲苯、 | 煤气、氢 |

| | | | | | |
|---|---|---|---|---|---|
| 燃温度（℃）与组别 | | | 乙烯、氯乙烯、氨苯、甲苯、苯胺、甲醇、一氧化碳、乙酸乙脂、乙酸、丙烯酸 | 民用煤气、环戊烷 | 气、焦炉煤气 |
| | T2 | 450≥T＞300 | 丁烷、乙酸、丙烯、丁醇、乙酸丁脂、乙酸戊脂、乙酸酐 | 环氧乙烷、环氧戊烷、丁二烯、乙烯 | 乙炔 |
| | T3 | 300≥T＞200 | 戊烷、己烷、庚烷、葵烷、辛烷、汽油、硫化氢、环乙烷 | 异戊二烯 | - |
| | T4 | 200≥T＞135 | 乙醚、乙醛 | - | - |
| | T5 | 135≥T＞100 | - | - | 二硫化碳 |
| | T6 | 100≥T＞85 | 亚硝酸乙脂 | - | 硝酸乙烯 |
| 注：表中未列入的爆炸性气体见 GB3836.1-2010 | | | | | |

| **Classification & Grade** | | **ⅡA** | **ⅡB** | **ⅡC** |
|---|---|---|---|---|
| Ignition temperature（°C）and groups | T1 | T＞450 | Ethane, propane, acetone, styrene, vinyl chloride, phenalgin, methyl benzene, aniline, methyl alcohol, carbon monoxide, acetic aster, acetic acid, acrylic acid | Dimethyl benzene domestic gas, cyclopentane | Coal gas, hydrogen and coke oven gas |
| | T2 | 450≥T＞300 | Butane, acetic acid, propene, butanol, butyl acetate, amyl | Ethylene oxide, pentene | acetylene |

| | | | | | |
|---|---|---|---|---|---|
| | | | acetate, acetic anhydride | oxide, butadiene and ethylene | |
| | T3 | 300≥T＞200 | Pentane, hexane, heptane, decane, octane, gasoline, hydrogen sulfide, cyclohexane | isoprene | - |
| | T4 | 200≥T＞135 | Ether, acetic aldehyde | - | - |
| | T5 | 135≥T＞100 | - | - | Carbon disulfide |
| | T6 | 100≥T＞85 | Nitrous ether | - | ethyleneni trate |
| Note: See GB3836.1-2010 for explosive gases not listed in the table. | | | | | |

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