热 电 阻 使 用 说 明 书

INSTRUCTIONS OF RESISTANCE THERMOMETER SENSOR

红器自控（江苏）有限公司

Hongqi Automatic Control (Jiangsu) Co., LTD

装配热电阻

Assembly Thermal Resistance

应　用

通常和显示仪表、记录仪表、电子计算机等配套使用。直接测量和各种生产过程中的 -200 ℃ - 500 ℃ 范围内液体、蒸汽和气体介质以及固体表面测温。

特　点

1、压簧式感温元件、抗振性能好；

2、毋须补偿导线、节省费用；

3、测量精度高；

4、机械强度高、耐压性能好；

5、进口薄膜电阻元件、性能可靠稳定；

工作原理

热电阻是利用物质在温度变化时，其电阻随着发生变化的特征来测量温度的。当阻值变化时，工作仪表显示出阻值所对应的温度值。

主要技术参数

产品执行标准

IEC751

JB/T8622-1997

JB/T8623-1997

常温绝缘电阻

热电阻在环境温度为 15-35 ℃，相对湿度不 80%，试验电压为 10~100v（直流）电极与外套管之间的绝缘电阻≥ 100MΩ

Application

It is usuakky connected with display meter, recording meter and computer,etc.-to directly measure temperature of liquid,vapor.gas and solid surface ranging from-200 ℃ to 500 ℃ during various production process.

Features

1.Spring thermal sensor with good shock-proof performance

2.No compensational wire,spare cost

3.High measuring accuracy

4.High mechanical strength.good pressure-resistant performance

5.Imported fim resitor with stsble &reliable performance

Operation Theory

It is based on that temperature change of material results in change of its resistance.When resistance value changes. the working insttument will display relevant temperature.

Main Technical Parameters

Executive Standard

IEC751

JB/T8622-1997

JB/T8623-1997

Insulation Resistance at Normal Temperature

The insulation resistance between electrode and protection tube of armored resistanve shall be no less than 100MΩ under condition that environment tomperature is 15-35 ℃ ,relative humidity is no more than 80%. and testing voltange is D.C.10~100V

测量范围及允差

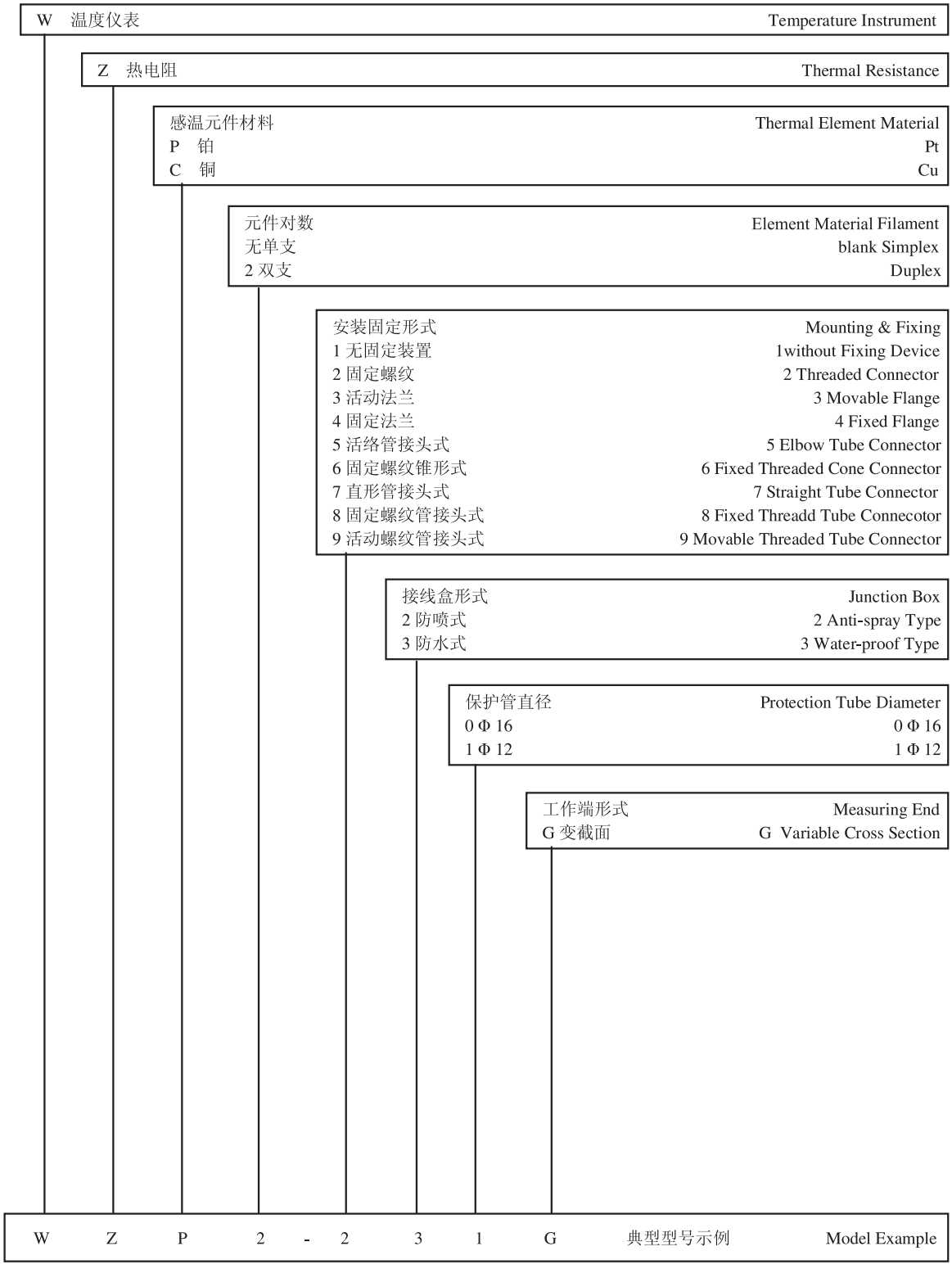
Measuring Range &Tolerance

型号 Tpye	分度号 Graduation	测量范围 Measuring Range ℃	精度等级 Accuracy	允许偏差 Tolerance
WZP	Pt100	-200 - +500	A 级	±（0.15+0.002）ltl
			B 极	±（0.30+0.005）ltl
WZC	Cu50 Cu100	-50 - + 100	-	±（0.30+0.006）ltl

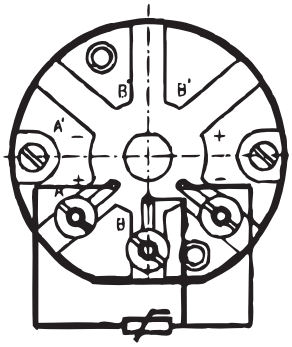
注：t 为感温元件实测温度绝对值　　Remarks:t is absolute value actually tested with thermal sensor

型号命名方法

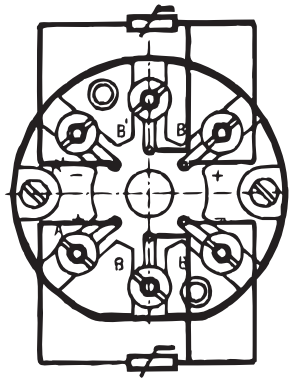
Type Naming Method



接线方式　Wiring Method



单支接线方法
Wiring Method (Simplex)



双支接线方法
Wiring Method (Duplex)

铠装热电阻

Armored Thermal Resistance

应　用

通常和显示仪表、记录仪表、电子计算机等配套使用。直接测量各种生产过程中的-200 ℃ -500 ℃范围内液体、蒸汽和气体介质以及固体表面温度。

特　点

●热响应时间少，减小动态误差；

●直径小，长度不受限制；

●测量精确度高；

●进口薄膜电阻元件，性能可靠稳定；

工作原理

铠装热电阻是利用物质在温度变化时，取电阻也随着发生变化的特征来测量温度的。当阻值变化时，工作仪表变显示出阻值所对应的温度值。

主要技术参数

产品执行标准

IEC751

JB/T8622 - 1997

Application

It is usually connected with displaymeter. recording meterand computer. ect. to directory maesure temperature of liquid.vapor.gas and sold surface ranging from -200 ℃ to500 ℃ during various production process.

Features

● With quick thermal response.reducing dynamic error

● Small diameter.no limit on length

● High measuring accuracy

● Impoted film resistor with high reliability and stability

Operation Theory

It is based on that temperature change of material reaults in change of its resistance. When resistance value changes.the working instrument will display relevant temperature.

Main Technical Parameters

Executive Standard

IEC751

JB/T8622 - 1997

元件直径材料　Element Material Filament Diameter & Material

元件形式 Element Material Filament	单支式 Simplex	双支式 Duplex
套管直径 Tube Diameter	Φ3 Φ4 Φ5 Φ6 Φ8	Φ4 Φ5 Φ6 Φ8
套管材质 Tube Material	1Cr18Ni9Ti	1Cr18Ni9Ti

常温绝缘电阻

热电阻在环境温度为15-35 ℃。相对湿度不大于80%，试验电压为10-100V（直流）电极与外套管之间的绝缘电阻≥ 100MΩ

Insulatioon Resistance at N

The insulation resistance between electrode and protection tube of armored thermal resistance shall be no less than 100M Ω under condition that envirinment temperature is 15-35 ℃， relative humidty is no more than 80%, and testing woltange is D.C.10-100V.

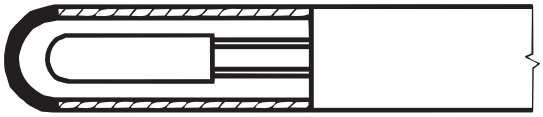
测温范围及温差　Measuring Range & Tolerance

型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range ℃	精度等级 Accuracy	允　差 Tolerance
WZPK	Pt100	-200- ＋500	A 级 Class A	±（0.15+0.002 | t |）
			B 级 Class B	±（0.30+0.005 | t |）

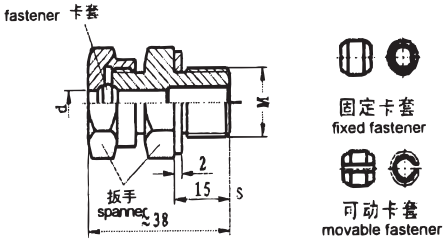
热响应时间　Thermal Response Time

管套直径 Sleeve Tube Diameter	热响应时间 Thermal Response Time
Φ3	≤ 3
Φ4	≤ 5
Φ5	≤ 8
Φ6	≤ 12
Φ8	≤ 15

测量端结构形式　Measuring End Configuration

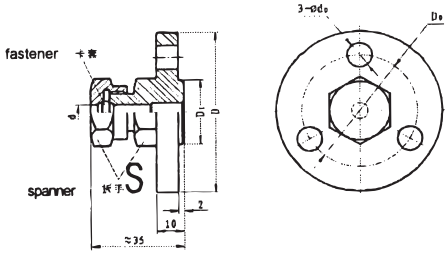


安装固定形式　Mounting & Fixong



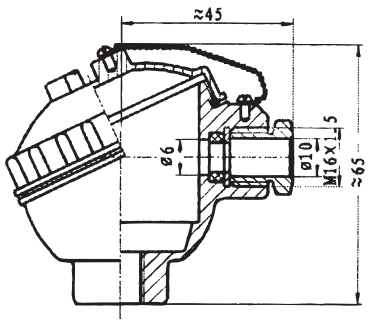
代号和尺寸 Code & Size	铠装阻外径 Outer Diameter of Armored Thermal Resistance	
	Φ8　Φ6　Φ5	Φ4　Φ3
M	M16*1.5	M12*1.5
S	22	19

卡套法兰盘　Flange with Fashtener

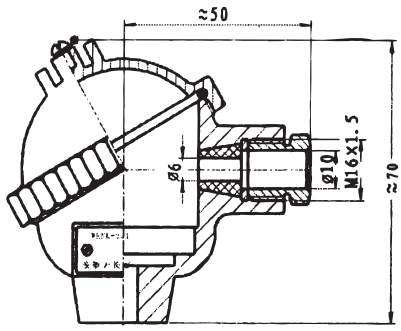


代号和尺寸 Code & Size	铠装阻外径 Outer Diameter of Armored Thermal Resistance	
	Φ8　Φ6　Φ5	Φ4　Φ3
D	Φ60	Φ50
D_0	Φ42	Φ36
D_1	Φ24	Φ20
S	Φ22	Φ19
d_0	Φ9	Φ7

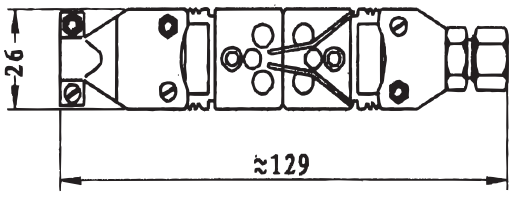
接线盒形式　Junction Box Figure



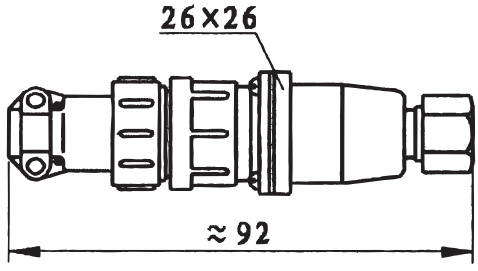
防喷式　Anti-spray Type



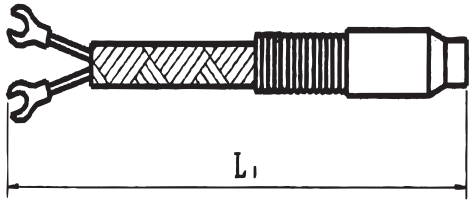
防水式　Water-proof Type



扁接插式　Flat Plug Type



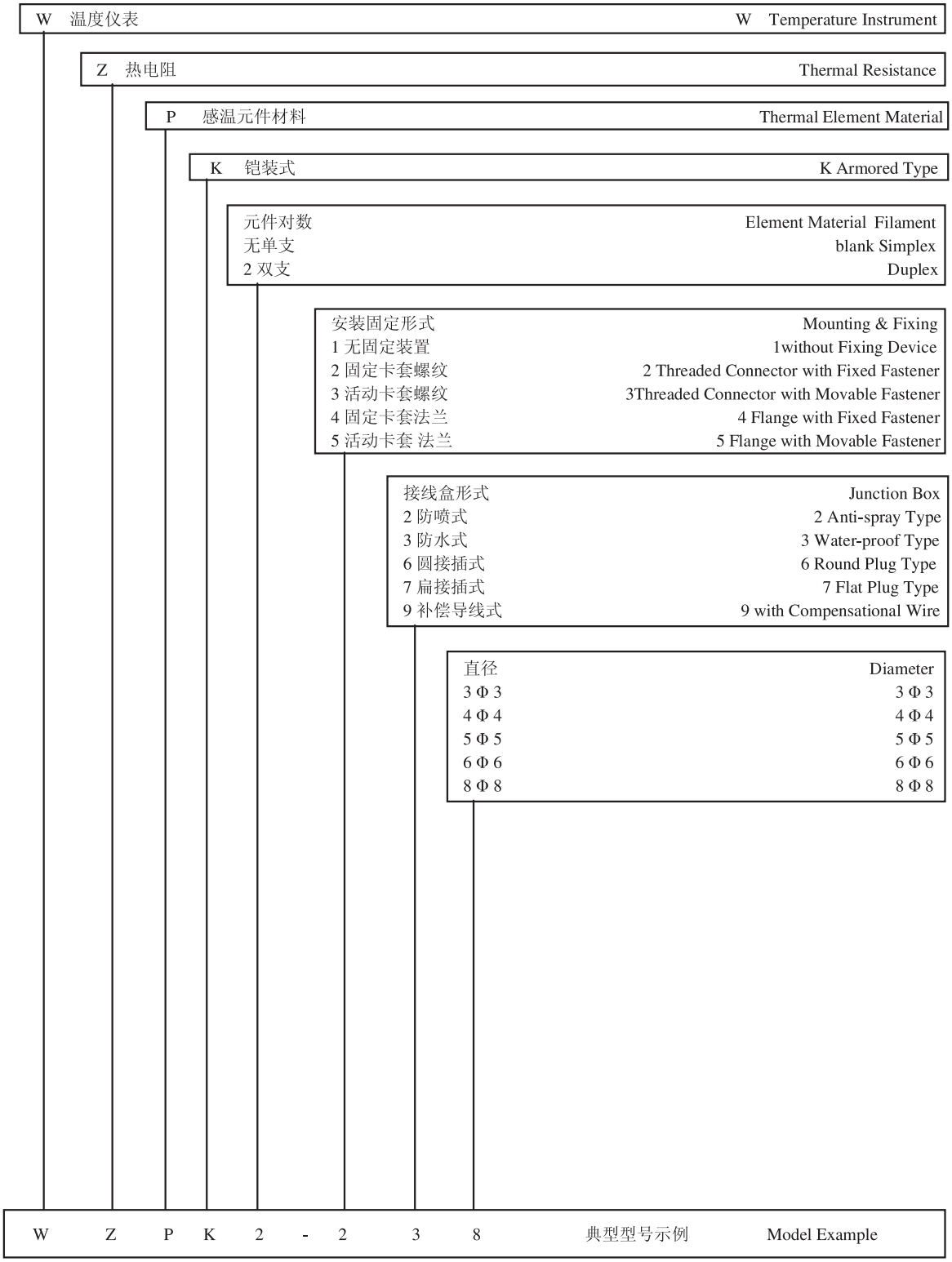
圆接插式　Round Plug Type



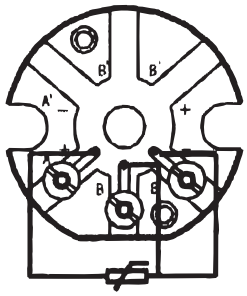
带补偿导线式　with Compensational Wire

型号命名方法

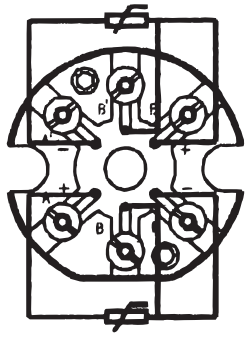
Type Naming Method



接线方式　Wring Method



单支接线方法
Wiring Method (Simplex)



双支接线方法
Wiring Method (Duplex)

防爆热电阻
Explosion-proof Thermal Resistance

应　用

通常和显示仪表、记录仪表、电子计算机等配套使用。直接测量各种生产现场存在碳氢化合物等爆炸物的 -200 ℃ -500 ℃范围内液体、蒸汽和气体介质以及固体表面温度。

特　点

1、压簧式感温元件、抗振性能好；

2、测量精确度高；

3、毋须补偿导线，节省费用；

4、进口薄膜电阻元件，性能可靠稳定；

工作原理

隔爆热电阻四利用物间隙隔爆原理，设计具有足够强度的接线盒等部件，将所有会产生火花、电弧和危险温度的零部件都密封在接线盒腔内，当腔内发生爆炸的时，能通过接合面间隙熄火和冷却，使爆炸后的火焰和温度传不到腔外，从而进行隔爆。

主要技术参数

产品执行标准

IEC751

JB/T8622-1997

JB/T8623-1997

JB/T8518-1991

常温绝缘电阻

防爆热电阻在环境温度为 15-35 ℃，相对温度不大于 80%，试验电压为 10~100V（直流）电极与外套管之间的绝缘电阻≥ 100MΩ

Application

It is usually connected with display meter, recording meter and computer. etc. to directly measure temperature of liquid. vapor. gas and solid surface ranging from -200 ℃ to 500 ℃ with exploxives such as hydricarbon on production sport.

Features

1.Spring thermal element with good shock-proof performance;

2.High measuring accuracy;

3.No compensational wire.spare cost;

4.Imported film resistor with high reliability and stability;

Operation Theory

Explosion-proof thermal resistance has a junction box of enough strength with gaps inside it. All spare parts which might profuce spark.electric arc.and dangerous high temperature are sealed in the junction box. When explosiorf within the box happens.fine and high temperature caused by explosion could be extincted and cooled.Thus.explosion separation could be realized.

Main Technical Parameters

Executive Standard

IEC751

JB/T8622-1997

JB/T8623-1997

JB/T8518-1991

Insulaton Resistance at Normal Temerature

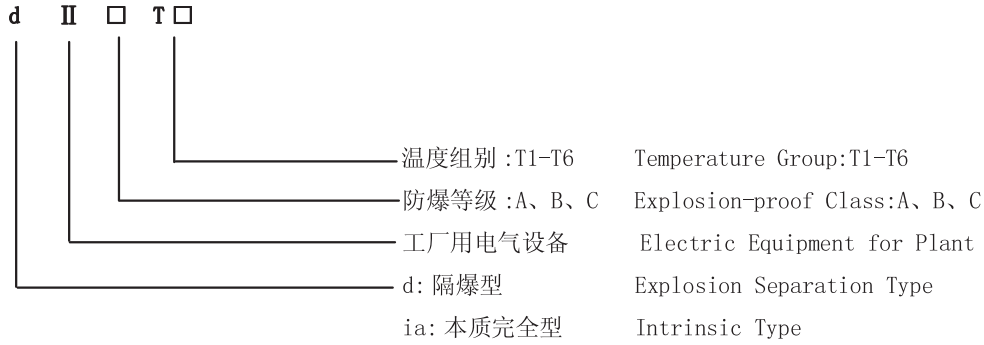
The insulation resistance between electrode and protrction tube of the thermocouple shall be no less than 100MΩ under condition that environment temperature is 15~35 ℃ .relative humidity is no more than 80%.and testing voltange is D.C.10~100V.

测温范围及允差　Meaduring Range & Tolerance

型号 Type	分度号 Graduation	测温范围 Measuring Range ℃	精度等级 Accuracy	允许偏差 Toleravce
WZP	Pt100	-200 - +500	A 级	±（0.15+0.002）| t |
			B 级	±（0.30+0.005）| t |
WZC	Cu50 Cu100	-50 - +100	-	±（0.30+0.005）| t |

注：t 为感温元件实测温度绝对值　　Remarks:t is absoiute valute vabue actually tested with thermal sensor

防爆分组形式
Indication of Explosion-proof Function



电气设备类别

Ⅰ类——煤矿井下用电气设备

Ⅱ类——工厂用电气设备

Electric Equipment Category

Ⅰ - Electric Equipment for Coal Mine Well

Ⅱ - Electric Equipment for Plant

防爆等级

防爆热电偶的防爆等级按其使用爆炸性气体混合物最大试验安全间隙分为 A、B、C 三级。

Explosion-proof Class

It is divided into grade A、Band C according to maximum test safety gap in explosive gas compound.

类别 Category	级别 Class	最大试验安全间隙（MESG）mm Maximum Test Safety Gap
Ⅱ	A	0.9 ≤ MESG
	B	0.5 ＜ MESG ＜ 0.9
	C	MESG ≤ 0.5

温度组别

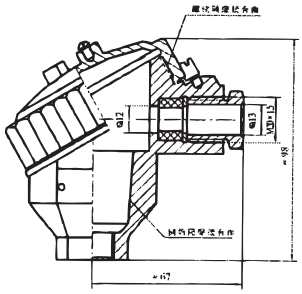
防爆热电偶的温度组别按其外露部分允许最高面温度分为 T1-T6

Temperature Group

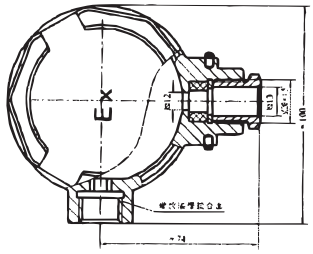
It includes T1-T6 according to the maximum temperature of open part.

温度组别 Temperature Group	允许最高表面温度℃ Max. Surface Temperature Allowed
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

接线盒形式 Junction Box Figure

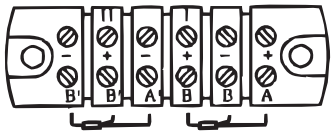


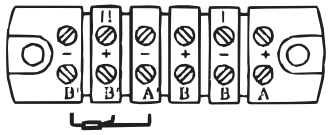
d Ⅱ BT □级
Class d Ⅱ BT □



d Ⅱ CT □级
Class d Ⅱ CT □

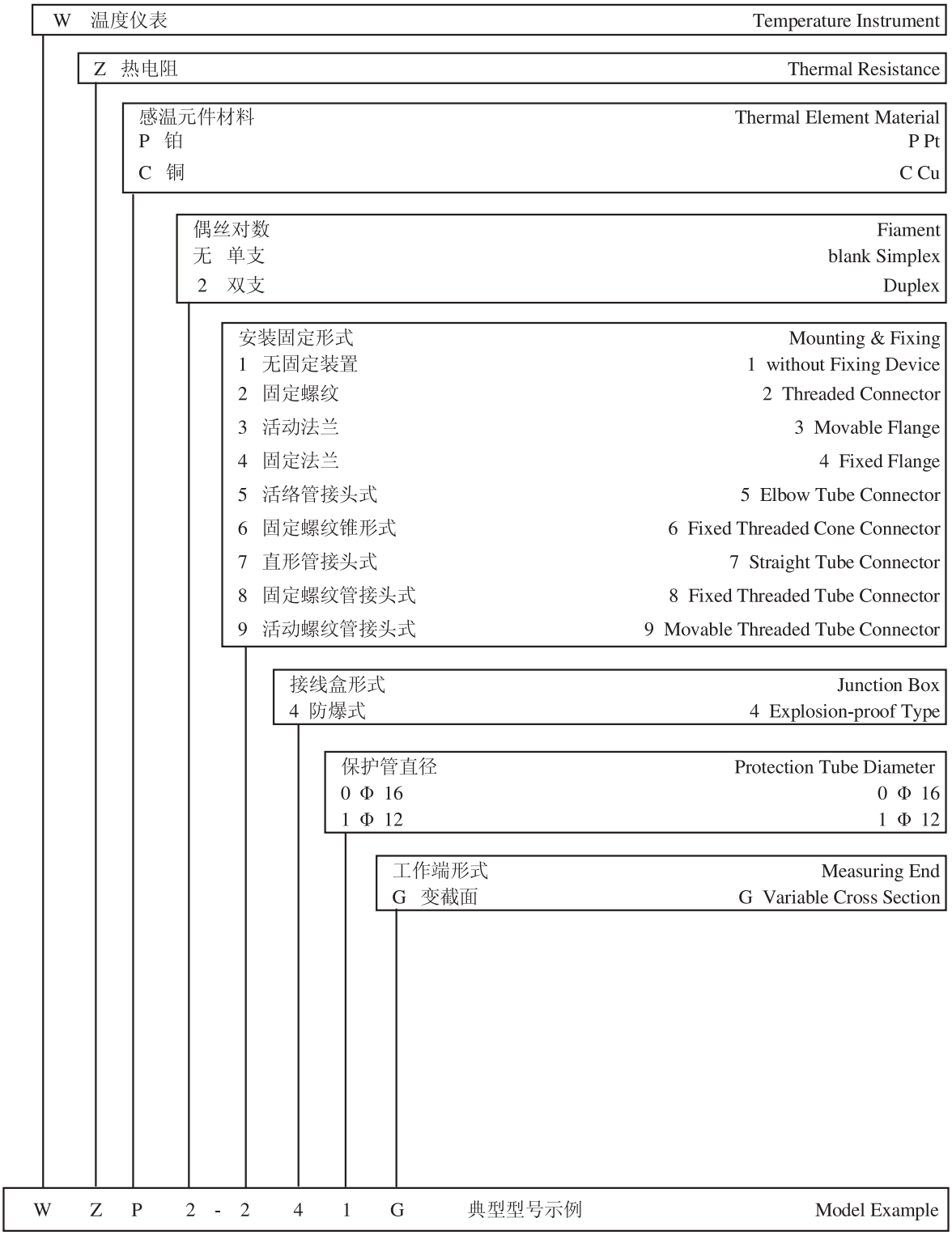
安装端子形式 Terminal Figure



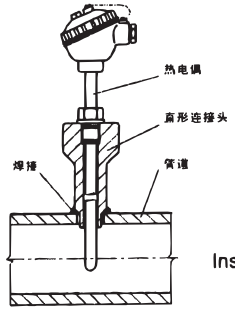


型号命名方法

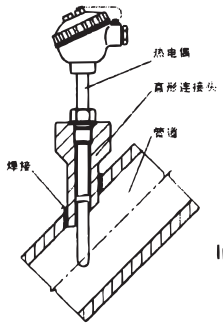
Type Naming Method



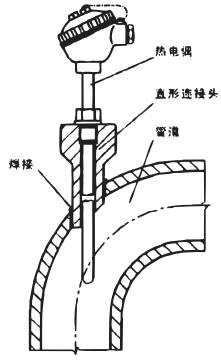
安装形式 Installation Figure



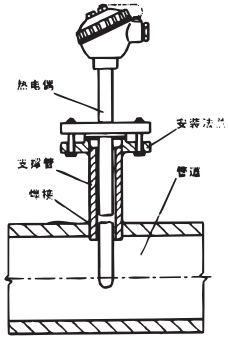
垂直管道安装形式
Installation in Horizontal Tube



倾斜管道安装形式
Installation in Sliding Tube



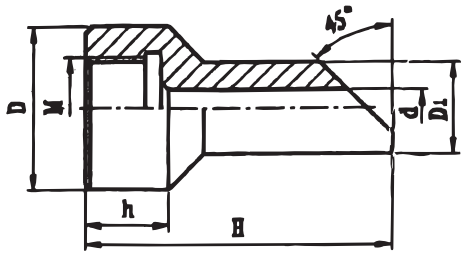
弯曲管道安装形式
Installation in Bending Tube



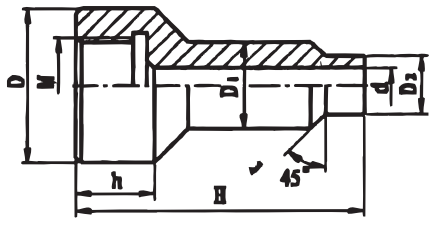
法兰安装形式
Flange Installation

直接连接头 Straight Connector

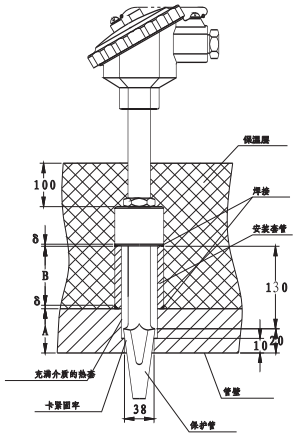
代号 Code	M	D	D_1	D_2	d	h	H
TH48A	M12*1.5	Φ32	Φ18	Φ12	Φ7	27	60.120
TH48B	M16*1.5	Φ36	Φ18	Φ14	Φ7	27	80
TH48C	M20*1.5	Φ40	Φ18	Φ14	Φ7	27	60
TH48D	M27*2	Φ47	Φ28	Φ22	Φ17	32	60
TH48E	M33*2	Φ55	Φ36	Φ30	Φ21	34	120
TH48F	NPT1/2	Φ39	Φ27	Φ21	Φ16	35	60 120
TH48G	NPT3/4	Φ47	Φ31	Φ25	Φ20	40	
TH48H	NPT1	Φ47	Φ41	Φ35	Φ30	45	



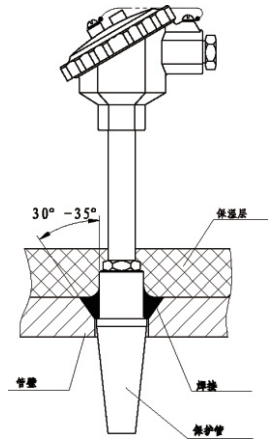
代号 Code	M	D	D_1	d	h	H
TH49A	M27*2	Φ47	Φ28	Φ18	30	90
TH49B	M33*2	Φ55	Φ36	Φ24	30	150
TH49C	NPT1/2	Φ39	Φ27	Φ16	30	90
TH49D	NPT3/4	Φ47	Φ31	Φ20	35	90
TH49E	NPT1	Φ47	Φ41	Φ30	40	150



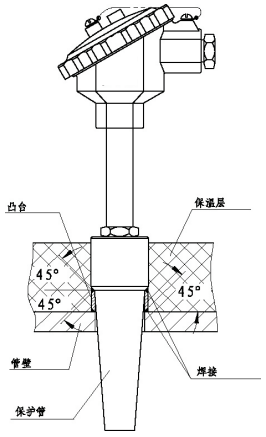
01T 型安装示意
01T Mounting figure



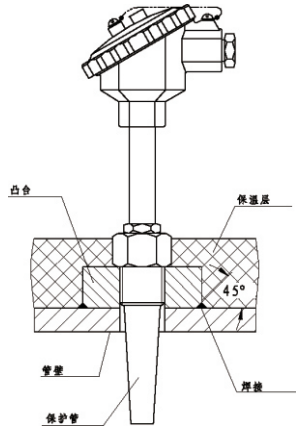
013T 型安装示意
013T Mounting figure

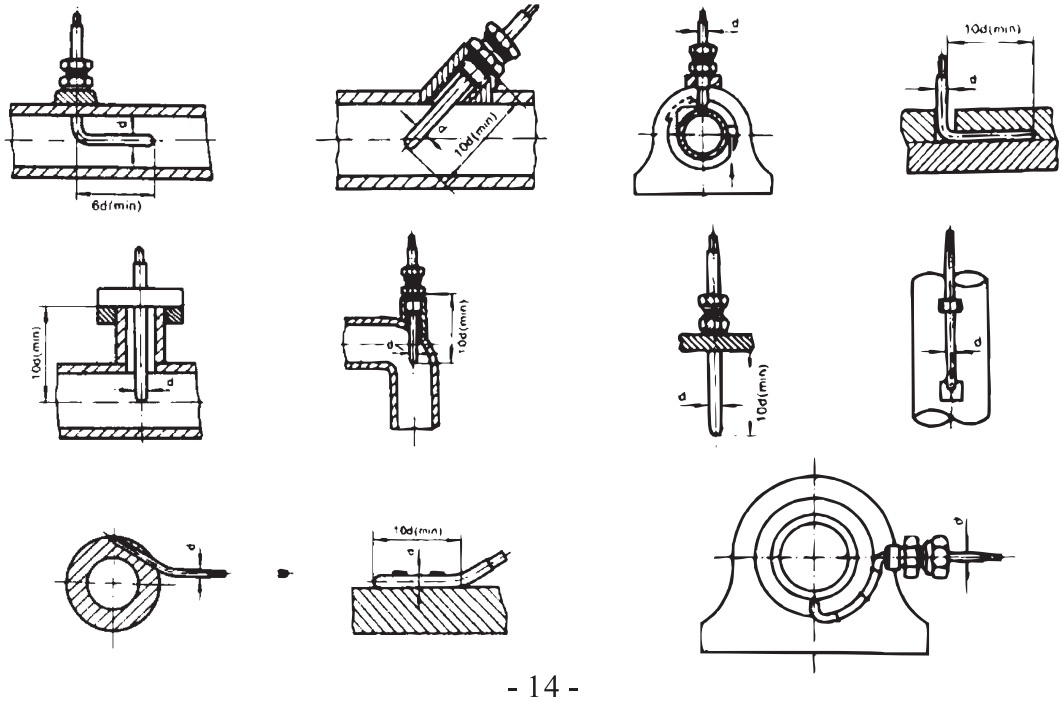


014T 型安装示意
014T Mounting figure



015T 型安装示意
015T Mounting figure





运输与贮存

热电阻及其附件在安装前必须贮存在不受震动和碰撞的地方，最合适的贮放场所条件为：环境温度 10-35℃、相对湿度不大于 80%，周围空气不含有可能造成热电阻零件腐蚀的杂质。

热电阻在长距离运输 过程中应仔细地包装好。

可能发生的故障及其修理

序号	故障现象	可能原因	修理方法
1	显示仪表显示值比实际偏低或示值不稳定	保护管内有水或接线盒上有金属屑、灰尘或热电阻短路	（1）倒出水或清除灰尘，并将潮湿部分加以干燥处理；提高绝缘（不能火烤）。 （2）用万用电表检查断路或接地的部位，并清除之。
2	显示仪表显示值无限大	热电阻断路	（1）用万用电表检查断路部位，确定是连接导线还是感温元件短路。 （2）如系敏感元件断路应进行更换。
3	显示仪表显示下限值	（1）热电阻短路 （2）显示仪表接线错误	（1）用万用电表检查确定短路部位，如系感温元件短路应进行修复或更换。 （2）重新连接导线。

Storage and transportation

Before fixing , the resistance thermometer sensor and its accers oriess should be stored away form vibration . The suitable ambient condetions for storage are as follows:temp. range form 10-35℃,relative humidity not more than 80% ,free from foreign substances that will cause eorrosin.

During long-distance transportation, the resistance thermometer sensor should be well packaged.

Troubleshoting

Order	Trouble	Poaaible cause	Remedy
1	The display value than practical value or is insteacy	There is water in the protective tube Metal crumbs or dust accumulated in terminal bead. The esistance thermometer sensor shortcircuited	1.Clear awaywater or dust and dry out the eampedpart (dry by a fire is not allowed) 2.To rind out short-cirouit with avometer and eliminste it if sesing element short-circuited it should be replaced
2	The readings of the display devive is infi nite	The wire in resistace thermometer sensor	1.To define whether the conductor or the sensing element is broken with avometer. 2.If the conductor is borken, It can be replaced or renovated.3.If the sensing element is broken, it should be replaced.
3	the diaplay device indicates	1.resistance thermometer sensor is short-circuit. 2.the wiring for the display device is incorrect	1.To determing the short-circuit If the sensing element short-circuted 2.To rewire correctly.