

## 双金属温度计 / 电接点双金属温度计

Bimetallic thermometer/Electric contact bimetallic thermometer

WSS / WSSX 系列  
WSS / WSSX Series

P-200

### WSS 系列 双金属温度计

### WSSX 系列 电接点双金属温度计

WSS Series  
Bimetallic thermometer

WSSX Series  
Electric contact bimetallic thermometer

#### 概述

本厂生产的双金属温度计其保护管、节头、锁紧螺栓等均采用 1Cr18Ni9Ti 材料,表壳采用铝板拉伸成型经切削加工表面黑色电泳处理,表盖与表盒采用环型双层橡胶圈螺纹密封锁紧结构,故仪表整体防水防腐性能良好,径向型仪表采用弯管型结构,外型新颖、轻巧、美观与众不同。

双金属温度计是用于测量中、低温的现场检测仪表,可以用来直接测量气体和液体的温度。与玻璃水银温度计相比具有无汞害、易读数、牢固耐用等优点。

WSSX 系列电接点双金属温度计带有电接触装置—即机械电接点。当被测介质温度变化时,自由端上的细轴及转向传动机构带动指针及动触点转动,在标度盘上指示出温度的变化值,当其与定触点(上、下限定触点)接触或断开的瞬时,使电路系统中的继电器及接触器动作,以达到自动控制和报警的目的,应符合 JB/T8803 1 998 标准。

#### 工作原理

双金属温度计是利用绕制成螺旋管状的双金属片一端被固定,另一自由端与指针针连接,随着温度的变化而转动,并带动指针旋转指示温度的单针式指示温度计。

#### 主要技术指标

测温范围: -60~500℃

精确度等级: 1.5级 基本误差: 限为量程的1.5%

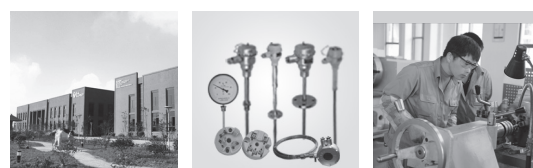
温度计指示部分: (按温度计标度盘的外径表示)分Φ60、Φ100、Φ150mm。

尾管长度: 100~2000mm。

尾管直径: 分别为Φ6、Φ10, 管长度100~1250mm时)  
Φ12(尾管长度在1250~2000mm时)

安装部分螺纹: M16×1.5; M27×2; G1/2; G3/4。尾管及固定螺栓节头等材料均为1Cr18Ni9Ti不锈钢,耐压6.4Mpa。

防水性能: 温度计的外壳应能承受距离5米处用喷嘴直径25毫米的水龙头喷水(喷嘴出口前水压不小于2公斤力/厘米。)历时5分钟,不得有水渗入温度计外壳内部。符合IP65标准。



#### Overview

The protective tube, section head, locking bolts of our bi-metal thermometer are all using 1Cr18Ni9 published material, the shell is made by aluminium plate which is stretched, then machined and surface black electrophoretic treated, table covers and table box with double-ring thread locking rubber ring seal structure, So the integral waterproof and corrosion is good. radial-type instrument used pipe structure, novel appearance, light, beautiful unique.

Bimetallic thermometer is used to measure the low temperature field instrumentation, can be used to directly measure the temperature of gases and liquids. Compared with the glass mercury thermometer, it has the advantages of no mercury-harm, easy to read, durable and so on.

WSS x series electric contact bimetallic thermometer has a electric contact device—namely machinery electrical contact. When the temperature of tested medium changes, thin shaft and steering transmission mechanism on the free end drive pointer and moving contact shafting, so changes in value of temperature will be displayed on the scale plate. when it connect or disconnect with the fixed contact (up, below limited contact), it makes the relay and contact in circuit system work, to achieve automatic control and alarm purpose. It should conform to JB/T8803 1 998 standard.

#### Work principal

Bimetal thermometer is single needle type indicating thermometer, of which one bimetallic strip in spiral pipe shape is fixed, and the other free end is connected with the needle pointer, rotates along with the temperature's changes, at the same time, drives the needle to rotate so as to indicate the temperature.

#### Main tech data

Measured range: -60~500℃

Accuracy level: 1.5 Basic error: 1.5% of range.

Indicated part of thermometer: (Indicated by external diameter of thermocouple)

Length of tail pipe: 100-2000mm。

Diameter of tail pipe: It is Φ 6 and Φ 10, (while length of 100-1250mm) Φ 12, (while length of 1250-2000mm) installing screw: M16X1.5; M27X2; G1/2; G3/4. The material of tail and fixed bolt is 1Cr18Ni9Ti stainless, and pressure resistance is 6.4Mpa.

Water proof performance:

Shell of thermometer should be able to withstand the water spray of the faucet(water press is not less than 2kgf/cm² before the nozzle sprays) for 5minutes without any water entering inner the thermometer shell, and the water is sprayed by the faucet of which the nozzle diameter is Φ 25mm, and is 5 meters far away. Thus, it's in accordance with standard IP65.

温度仪表系列 Temperature Instruments series



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WSSX 系列 电接点双金属温度计

精度等级：1.5 级，接点动作误差差限为示值基本误差限的 1.5 倍。  
接点额定功率：10VA  
接点最高工作电压：~380V 或 220V  
接点最高工作电流：1A( 无感负载 )  
工作电压宜存大于 15V 小于 48V 的情况下使用。

WSSX series electric contact bimetallic thermometer

Accuracy level: 1.5 class, the error limit of joint action is 1.5 times of basic error.  
Rated power of junction: 10VA  
Max work voltage of junction: ~380 or 220V  
Max work current of junction: 1A (noninductive load)  
The working voltage is suitable for the occasion between 15V and 48V.

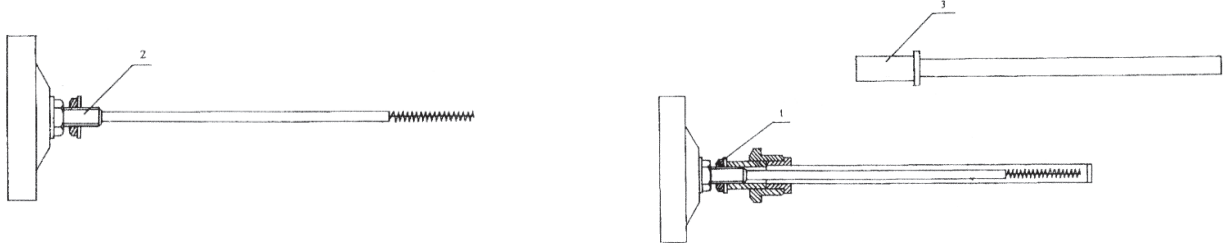
型号表示 Model



工作条件 Working conditions

温度计型式 Type	工作场所 Workplace	温度℃ Temp	相对湿度% Relative humidity
普通电接点型 Common electric contact type	遮蔽场所 Shelter occasions	-25~+55	5~100%
	户外场所 Out door	-40~ + 85	5~100%
		-40~+55	<85
	为保证温度计的正确发讯、读数、应避免在震动或脉动的场合下使用。 For correct delivery and read, the thermometer is not recommended in vibrated or pulsatile occasions.		

热套式示意图 Thermal sleeve type diagram



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温度计形式

热套式

普通型双金属温度计特别在高温、高压或挥发性有害气体介质中使用、若仪表损坏需要更换时则必须降温、降压或停机。而采用热套型双金属温度计，在仪表损坏须更换时则不必降温降压更不必要停机。则只须更换仪表机芯即可，企业可实现连续生产。

角型 ( 轴向型 )

检测元件轴线与标度盘平面垂直的形式，亦称轴向型。

直型 ( 径向型 )

检测元件轴线与标度盘平面平行的形式，亦称径向型。

我厂生产的径向型双金属温度计为国内独创弯管式造型，结构新颖、美观轻巧。防腐防水性能好。表盒与角型温度计通用，有铝板拉伸黑色亚光电泳处理，也有不锈钢板材拉伸成型，弯管也为全不锈钢型。

万向型

除具有角型直型功能外并能由角型转化为直型或由直型转化为角型可由用户任意无级调角，所用波纹管及结构件材质均为 1Cr18Ni9Ti 不锈钢，故使用方便耐腐蚀性能优越。

温度计一般以角型出厂，即在角型使用时零位不用调整。用户如需直型出厂时，则须在订货时注明。

温度计由直型转化为角型或角型转化为直型时温度计示值有微小变化，一般可忽略不计，如用户有较高要求时，可由用户自行在变型式时调整零位。用户可逆时针旋开表盖，再用扳手逆时针松动标盘锁紧螺母在冰点槽内调整“0”位，再锁紧螺母及表盖即可。

热套式长颈型 ( 型号：WSS-D)

热套式长颈型双金属温度计是专为电站温度测量需要而专门开发的新型产品。也可用于化工、石油、冶金、纺织、医药等部门热力过程的设备和管道介质测温。

在电站热力过程中，为防止热量大量的损失，在热力设备和热力管道外敷设有较厚的保温层，采用以往的双金属温度计因其颈部尺寸较短，往往要将保温层局部破坏方可将表头暴露在外，新开发的热套式长颈型双金属温度计由于采用特殊的结构，使表头高于保温层外，以达到便于观察，节约能源。因其是热套式，可随时更换表头，且温度计形式可需调换。本产品已申请国家专利：专利申请号：97234368.7

Types of thermometer

Hot jacket type

When using general type bimetal thermometers ,particularly in temperature,high pressure or volatile harmful solution quality, it has to cool down, reduce pressure or stop in order to replace when instrument damaged. however when using the bimetal thermometer thermal dwelling , it is unnecessary. it only needs to replace the meter movement so that enterprises can achieve a continuous production

Angle type (Axial type)

detection device axis is vertical to scale plate, also called as axial type.

Straight (Radial type)

detection device axis is horizontal to scale plate, also called as radial type.

our bimetal thermometer with excellent water-proof and wear-resistant performances, novel, light. The cover is same as that of angle type, it's treated with black matte electrophoresis, also has stainless steel type, the bend tube is also stainless steel.

Universal angle type

it is steppless adjustable, bellows is 1Cr18Ni9Ti stainless steel, corrosion-resistant.

Factory thermometer is defaulted as angle type, you shall note when straight type is required.

When you adjust the angles, there may be tiny changes in temperature, please neglect it. You can adjust zero by open the cover, then loosen lock nut with a wrench, adjust zero in ice point groove,finally lock the nut and close the cover.

Thermal sleeve long-necked type (Model: WSS-D)

Hot-jacket long neck type bimetal thermometer is specially for power plant, also can be used in chemical industry, oil, metallurgy, textile, medicine etc.

To prevent large loss of heat in power plant, put thick protection layer outside devices and pipelines. The new long-neck thermometer can make header out of the the protection layer, easy to observe and read. And you can change the header at any time when replace is required. Product patent number is 97234368.7

颈长规格见下表 Neck length specification table

Table with 4 columns: 形式 length, 颈长 Type, A, A. Rows include 直型 Straight type, 角型 Angle type, and 万向型 Universal type with corresponding dimensions.

颈长 A 尺寸也可按用户实际需要定制

The dimensions of neck can be customized.

※订货时型号按如下要求填写

The model should be filled in as follows

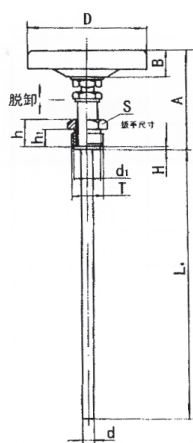
例：WSS-481D L\*A=300\*216
是指标度盘尺寸为中 100，外螺纹固定万向型插入深度 300mm 颈长 216mm

Example : WSS-481D L\*A=300\*216
The dimensions of scale is Φ 100, and depth of outer thread is 300, and the length is 216mm.

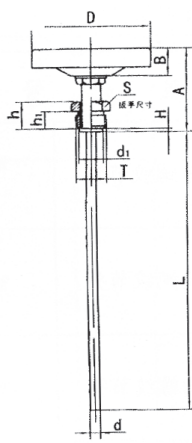


## 双金属温度计 / 电接点双金属温度计 Bimetallic thermometer/Electric contact bimetallic thermometer

WSS / WSSX 系列  
WSS / WSSX Series



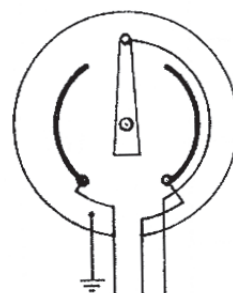
热套式角型  
Hot jacket angle type



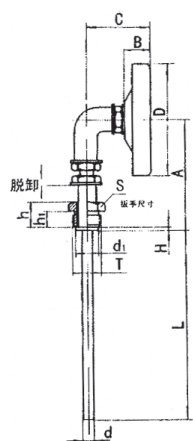
轴向型 角型  
Axial type Angle type

### 电接点双金属温度计接线图

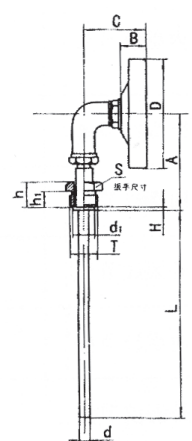
Bimetallic thermometer electric contact wiring diagram



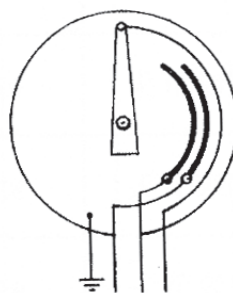
绿 黄 红 蓝  
双上限 Double down limit



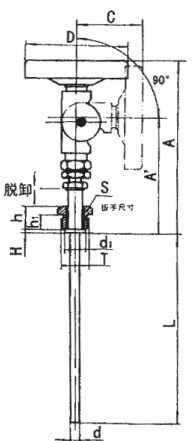
热套式直型  
Hot jacket straight type



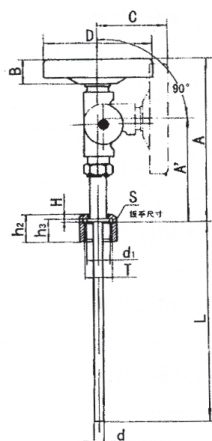
径向型 直型  
Radial type Straight type



绿 黄 红 蓝  
双上限  
Double up limit



热套式万向型  
Hot jacket universal type



万向型  
Universal type



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型号规格及测量范围 specification, model and range

型号 Model			外壳公称尺寸D Housing size	测量范围℃ Range	分隔值℃ separate value	插入长度L insertion length	保护直径d protection diameter	安装螺纹T thread
角型 Angle	外螺纹节头 male thread joint	WSS 301	67	-10~+40	1	75	6	M16 × 1.5, G1/2"
		WSS 401	107				10	M27 × 2 G3/4"
		WSS 501	157				6	M16 × 1.5, G1/2"
	内螺纹节头 female thread joint	WSS 302	67			100	10	M27 × 2 G3/4"
		WSS 402	107				6	M16 × 1.5, G1/2"
		WSS 502	157				10	M27 × 2 G3/4"
直型 Straight	内螺纹节头 female thread joint	WSS 311	67	-80~+40	2	150	6	M16 × 1.5, G1/2"
		WSS 411	107				10	M27 × 2 G3/4"
		WSS 511	157					
	内螺纹节头 female thread joint	WSS 312	67					
		WSS 412	107					
		WSS 512	157					
	万向型 universal type	外螺纹节头 male thread joint	WSS 481			107	0~50	1
WSS 581			157					
内螺纹节头 female thread joint		WSS 482	107					
		WSS 582	157					
热套式角型 Hot-jacket angle type	外螺纹节头 male thread joint	WSS 451	107	0~100	2	500		
		WSS 551	157					
	内螺纹节头 female thread joint	WSS 452	107					
		WSS 552	157					
热套式直型 Hot-jacket straight type	外螺纹节头 male thread joint	WSS 461	107	0~150	2	750		
		WSS 561	157					
	内螺纹节头 female thread joint	WSS 462	107					
		WSS 562	157					
热套式万向型 Hot-jacket universal type	外螺纹节头 male thread joint	WSS 471,571	107/157			1000		
	内螺纹节头 female thread joint	WSS 472,572	107/157					
电接点角型 Electric contact angle type	外螺纹节头 male thread joint	WSSX 401	107	0~200	5	1250		
	内螺纹节头 female thread joint	WSSX 402						
电接点直型 Electric contact straight type	外螺纹节头 male thread joint	WSSX 411		0~300	5	1500		
	内螺纹节头 female thread joint	WSSX 412						
电接点万向型 (电接点) Electric contact universal type	外螺纹节头 male thread joint	WSSX 481		0~400	10	1750		
	内螺纹节头 female thread joint	WSSX 482						
热套式角型 (电接点) Hot-jacket angle type	外螺纹节头 male thread joint	WSSX 451		~500	10	2000		
	内螺纹节头 female thread joint	WSSX 452						
热套式直型 (电接点) Hot-jacket straight type	外螺纹节头 male thread joint	WSSX 461						
	内螺纹节头 female thread joint	WSSX 462						
热套式万向型 (电接点) Hot-jacket universal type	外螺纹节头 male thread joint	WSSX 471						
	内螺纹节头 female thread joint	WSSX 472						

温度仪表系列 Temperature Instruments series



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外型及安装尺寸 Outline dimensional drawing

型式 Type	代号 No		D	A	A'	B	C	d	d <sub>1</sub>	H	h	h <sub>1</sub>	h <sub>2</sub>	h <sub>3</sub>	S	S'	T		
角型 ( 轴向型 ) Angle	Φ 67	64		68	26		Φ 6	Φ 14	3	24	16	28	24	30	32	M16 × 1.5 G1/2"			
	Φ 107	25			Φ 10	Φ 24	M27 × 2 G3/4"												
	Φ 157							27											
直型 ( 径向型 ) Straight type	Φ 67	69		26	43	Φ 6	Φ 14	Φ 10								M27 × 2 G3 / 4"			
	Φ 107	88		25	58														
	Φ 157	114		27	60														
万向型 Universal type	Φ 107	156	98	25	68	Φ 12	M27 × 2 G3 / 4"												
	Φ 157	182	122	27	70														
热套式角型 hot-jacket angle type	Φ 107	80		25		Φ 12		M27 × 2 G3 / 4"											
	Φ 157			27															
热套式直型 hot-jacket straight type	Φ 107	95		25	58	Φ 12											M27 × 2 G3 / 4"		
	Φ 157	121		27	60														
热套式万向型 hot-jacket universal type	Φ 107	164	109	25	68	Φ 24												M27 × 2 G3 / 4"	
	Φ 157	190	135	27	70														
电接点角型 electric contact angle type	Φ 107	101		60		Φ 10													M27 × 2 G3 / 4"
电接点直型 electric contact angle type		88			93														
电接点万向型 electric contact universal type		186	98		104	Φ 12													
热套式角型电接点 hot-jacket angle type contact		116																	
热套式直型电接点 hot-jacket straight type contact		96	93																
热套式万向型电接点 hot-jacket universal type contact		200	110		104														

注：尾管材质可按用户需要另可选用 OCrl8Ni2Mo2Ti,SUS304 SUS 316. 也可在 1Cr18Ni9Ti 保护管外镀聚四氟乙烯或 ANA 耐磨耐腐层。(注：ANA 为多元合金材料，具优异的面腐蚀性和高耐磨性，寿命可比不锈钢提高几倍乃至几十倍。)

Note : tail pipe material can be selected OCrl8Ni2Mo2Ti,SUS304 SUS316 as the customers' requirement ,and can also plate PTFE or ANA on the outside of pipe as the anti-corrosive and anti-Wearing layer . ( note:ANA is complex alloy material with excellent anti-corrosive and anti-Wearing property , the using life has improved several times ,even dozens of times more than Stainless steel )

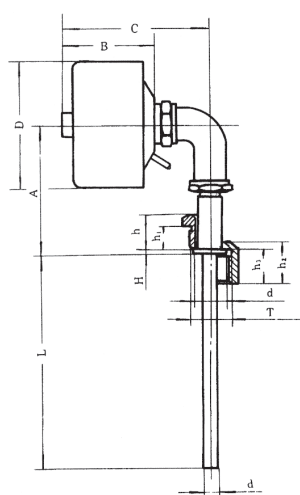


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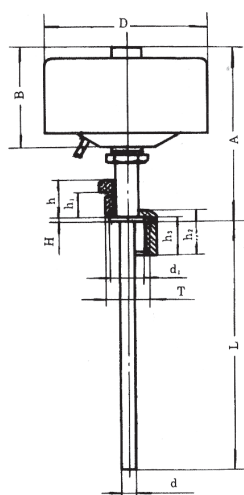
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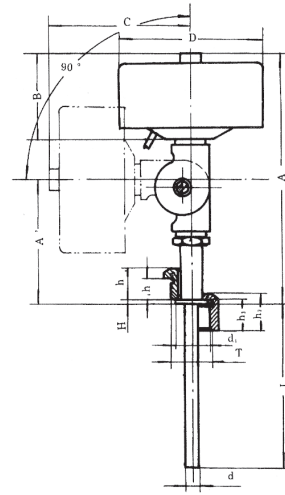
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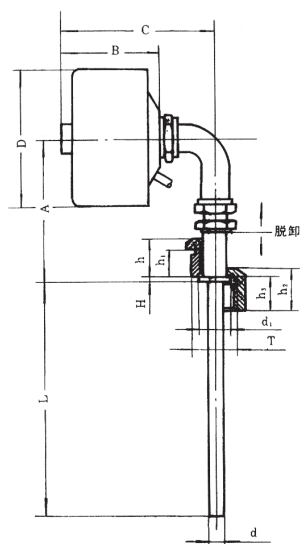
直型电接点  
Straight type electric contact



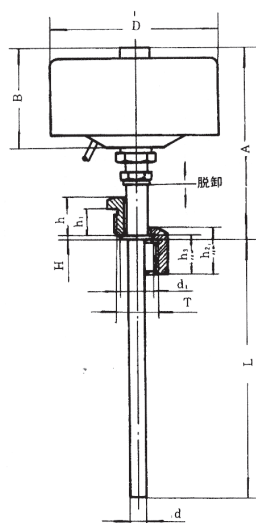
角型电接点  
Angle type electric contact



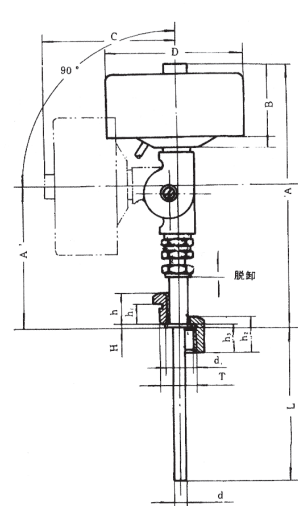
万向型电接点  
Universal type electric contact



热套式直型电接点  
Thermal sleeve type straight type electric contact



热套式角型电接点  
Thermal sleeve type angle type electric contact



热套式万向型电接点  
Thermal sleeve type universal type electric contact

### 使用与维修

1. 为保证温度计的正确性，尾管浸入被测介质的深度视尾管长度不同应在 75 以上。
2. 读数时视线应与标度盘垂直。
3. 温度计在正常使用后（一般不超过一年）应按工业双金属温度计有关检定规程进行定期检定。
4. 热套式温度计使用过程中遇到损坏需要更换时，则只需逆时针松动螺母 1，然后旋出表芯 2，保护套 3 留在设备中，将新的表芯装入，勿使双金属螺旋管与保护套底部接触，旋紧螺母 1 即可。
5. 温度计在运输、保管、安装、使用过程中应避免碰撞尾管，切勿使其弯曲变形。
6. 温度计的正常工作条件应按表 1 表 2 要求。

### Usage and maintenance

1. To guarantee the correctness of thermometer, the depth of the tail tube immersed into the measured medium shall be over 75% depending on lengths of tail tubes.
2. When reading, sight shall be vertical to dial plate.
3. After normally used, thermometer shall be periodically tested according to relevant testing rules of industrial bimetallic thermometer. (normally not over 1 year)
4. When thermal sleeve type thermometer needs exchanging once damaged during usage, loose nut 1 in counter clockwise, then screw out the meter core 2 and keep the protection sleeve 3 in the machine. After that, insert the new meter core, avoid bimetallic spiral tube contact with protection sleeve bottom and tighten nut 1.
5. During delivery, safekeeping, erection and usage of thermometer, collision of the tail tubes shall be avoided and do not let it bent and distorted.
6. The normally working conditions shall be according to the requirements in Table 1 and Table 2.

