

温度仪表

TEMPERATURE INSTRUMENT



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奥力申仪表电缆
ALS CABLE & INSTRUMENT

双金属温度计

Bimetallic Thermometer

应用

双金属温度计是一种测量中低温度的现场检测仪表。可以直接测量各种生产过程中的 -80°C ~ $+500^{\circ}\text{C}$ 范围内液体、蒸汽和气体介质温度。

特点

1. 现场显示温度，直观方便
2. 安全可靠，使用寿命长；
3. 多种结构形式，可满足不同要求；

工作原理

双金属温度计是基于绕制成环性弯曲状的双金属片组成。一端受热膨胀时，带动指针旋转，工作仪表便显示出热电势所应的温度值。

主要技术参数

1. 产品执行标准
JB/T8803-1998
2. 标度盘公称直径：60, 100, 150
3. 精度等级：(1.0), 1.5
4. 热响应时间：≤ 40s
5. 防护等级：IP55
6. 角度调整误差
角度调整误差应不超过其量程的 1.0%
7. 回差
温度计回差应不大于基本误差限的绝对值的 1/2
8. 重复性
温度计重复性极限范围应不大于基本误差限绝对值的 1/2
9. 测温范围

Application

It is one kind of thermometers to measure middle and low temperature on the spot. It could be used to directly measure temperature of liquid, vapor and gas ranging from -80°C to 500°C .

Features

1. directly display temperature on the spot
2. high reliability and long life expectancy
3. many structure forms to meet different demands

Operation Theory

Bimetallic thermometer is based on bimetal bended into ring shape. One side of bimetal expands in time of being heated, which results in revolving of indicator, then the meter indicates corresponding temperature value to pyroelectric potential.

Main Technical Parameters

1. Executive Standard
JB/T8803-1998
2. Nominal Diameter of Dial: 60, 100, 150
3. Accuracy Class: (1.0), 1.5
4. Thermal Response Time: ≤ 40s
5. Protection Class: IP55
6. Angle-adjusting Error
It shall be no more than 1% of its measuring range
7. Return Error
It shall be no more than the absolute value of basic error limit.
8. Repeat
The repeat range shall be no more than 1/2 of absolute value of basic error limit.
9. Measuring Range

测温范围℃ Measuring Range	适应范围 Application Range	
	工业、商业 for Industry & Commerce	实验室、小型 for Laboratory
-80~+40	✓	✓
-40~+80	✓	✓
0~50	✓	✓
0~100	✓	✓
0~150	✓	✓
0~200	✓	✓
0~300	✓	✓
0~400	✓	—
0~500	✓	—

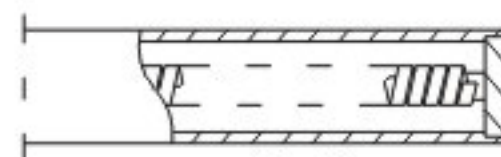
10 正常工作大气条件

10. Ambient Condition for Normal Operation

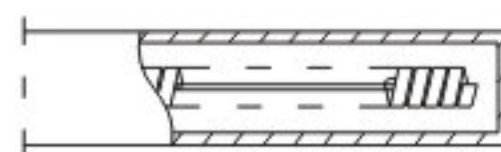
工作场所 Working Place	温度 Temperature(℃)	相对湿度 Relative Humidity %
掩蔽场所 Sheltered Place	-25~+25	5~100
户外场所 Outdoor	-40~+85	5~100

11 测量端形式

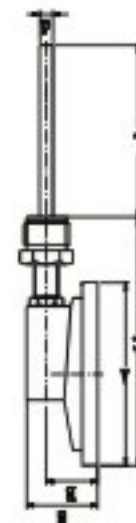
11. Measuring End



一体式
Integration Type



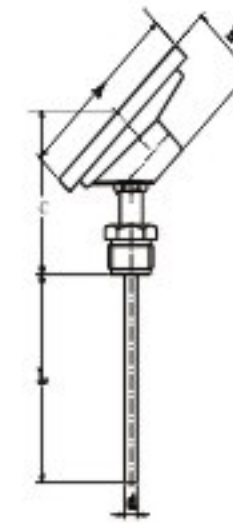
轴芯式
Core Type



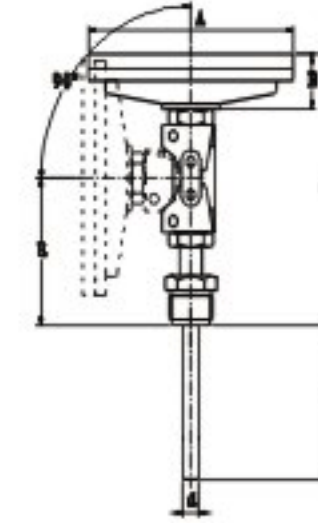
轴向型
Axial



径向型
Radial



135° 角型
135° Angle



万向型
Universal

12 外形尺寸

12. Figure & Size

形式 Structure	A	B	C	E	L	D
轴向型 Axial	65	23	73	-	75	Φ6 Φ8 Φ10
	105	23	73	-	100	
	155	23	73	-	150	
径向型 Radial	65	50	110	34	200	
	105	50	110	34	300	
	155	50	110	34	400	
135° 角型 135° Angle	105	23	85	-	500	
	155	23	85	-	750	
万向型 Universal	105	23	178	120	1000	
	155	23	178	120		

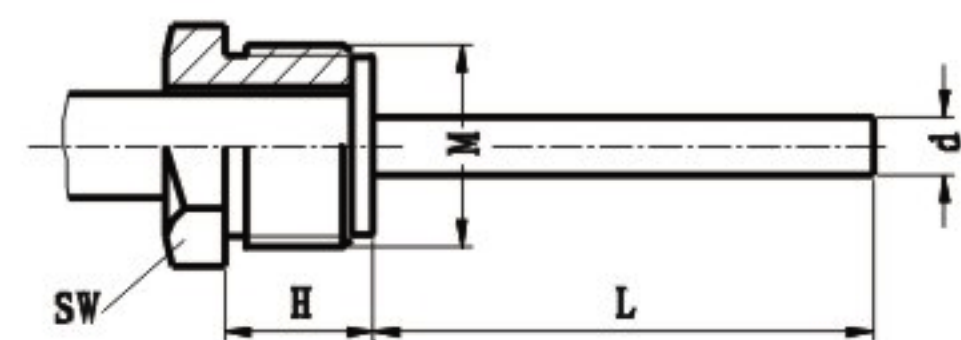
安装固定形式

Mounting & Fixing

可动外螺纹管接头

Movable Outer Threaded Tube Connector

M	H	SW	
M16 × 1.5	12	18	Φ6 Φ8 Φ10
M20 × 1.5	16	22	
M27 × 2	20	30	
NPT 1/4	15	18	
NPT 1/2	19	22	
NPT 3/4	25	30	

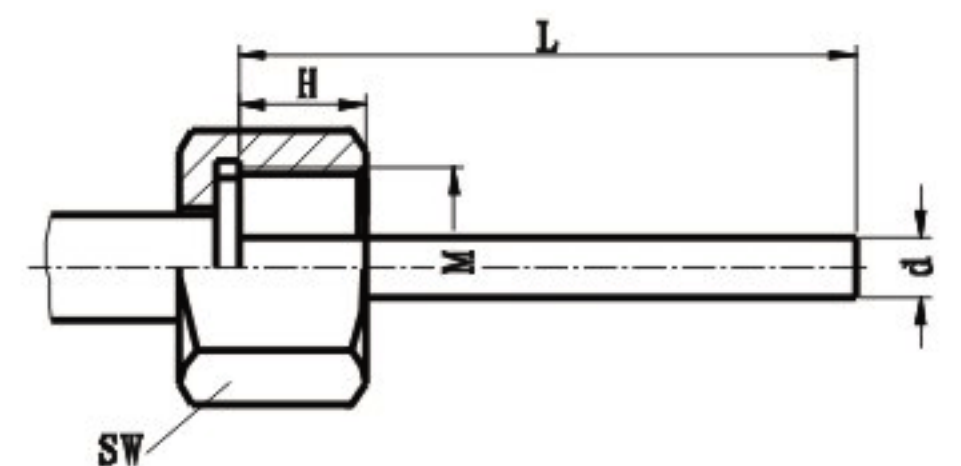


可动外螺纹管接头
Movable Outer Threaded Tube Connector

可动内螺纹管接头

Movable Inner Threaded Tube Connector

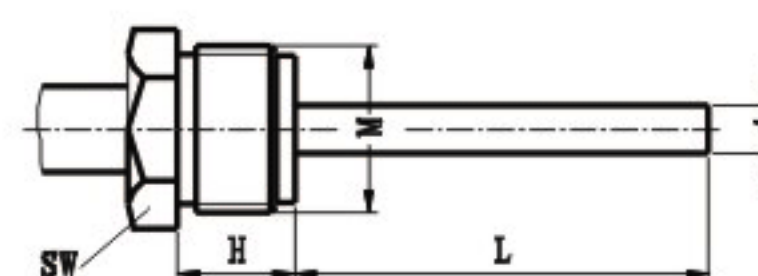
M	H	SW	
M16 × 1.5	12	18	Φ6 Φ8 Φ10
M20 × 1.5	16	22	
M27 × 2	20	30	
NPT 1/4	15	18	
NPT 1/2	19	22	
NPT 3/4	25	30	



可动内螺纹管接头
Movable Inner Threaded Tube Connector

固定螺纹接头 Threaded Connector

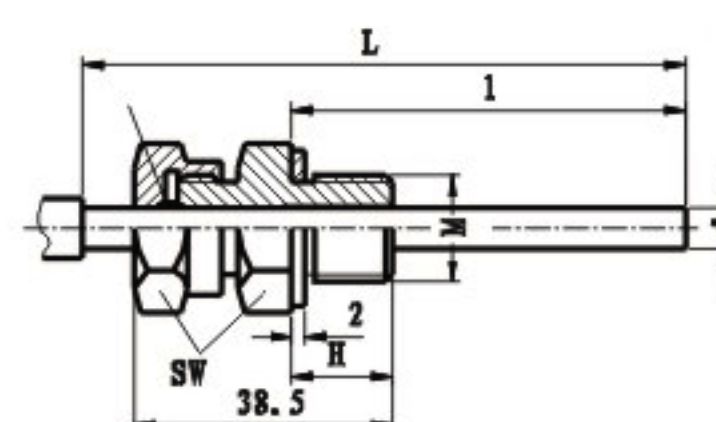
M	H	SW	Φ6 Φ8 Φ10
M16 × 1.5	12	18	
M20 × 1.5	16	22	
M27 × 2	20	30	
NPT1/4	15	18	
NPT1/2	19	22	
NPT3/4	25	30	



固定螺纹接头
Threaded Connector

卡套螺纹接头 Threaded Connector with Fastener

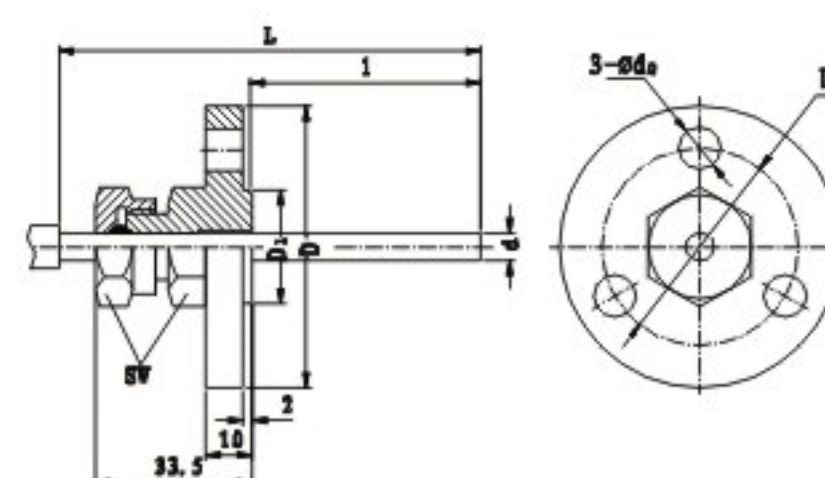
M	H	SW	d
M12 × 1.5	15	19	Φ6
M16 × 1.5	15	22	Φ8
M20 × 1.5	16	24	Φ10



卡套螺纹接头
Threaded Connector with Fastener

卡套法兰接头 Flange with Fastener

D	D ₁	D ₂	SW	d ₀	d
Φ60	Φ42	Φ24	Φ22	Φ9	Φ8 Φ10



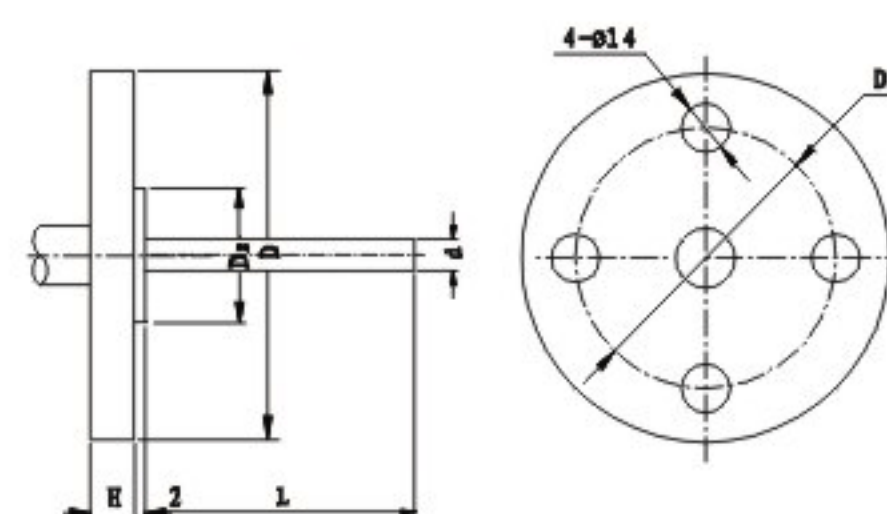
卡套法兰接头
Flange with Fastener

固定法兰 Fixed Flange

D	D ₁	D ₂	H	d ₀	d
Φ105	Φ75	Φ5	Φ16	Φ14	Φ8 Φ10

注：可提供ANSI、JB、HG等标准法兰

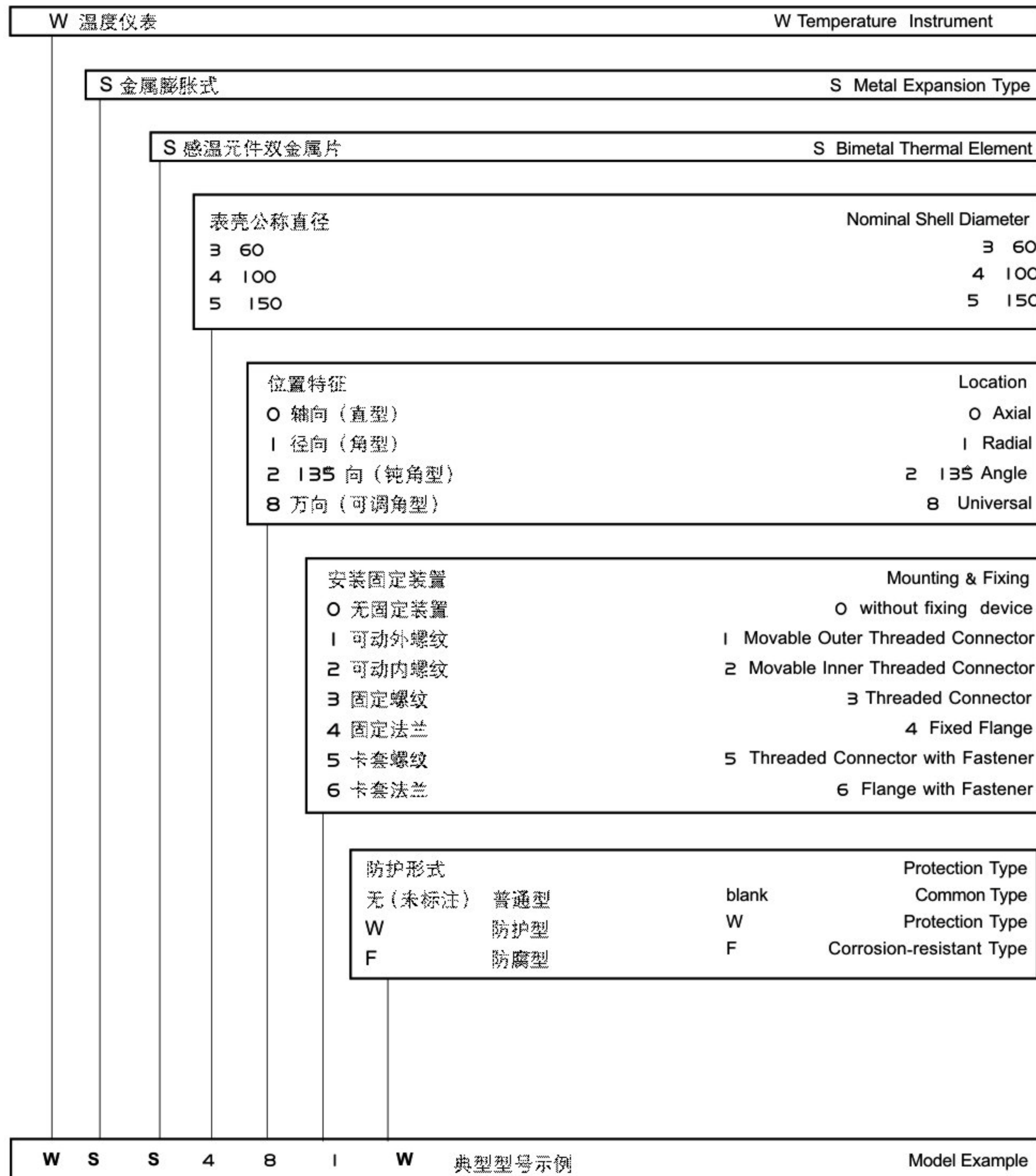
Remarks: We may provide flanges of ANSI, JB, HG or other standard.



固定法兰
Fixed Flange

型号命名方法

Type Naming Method

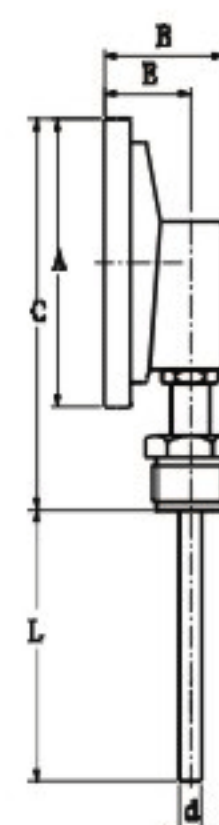


型号及规格

Type & Specification



轴向型

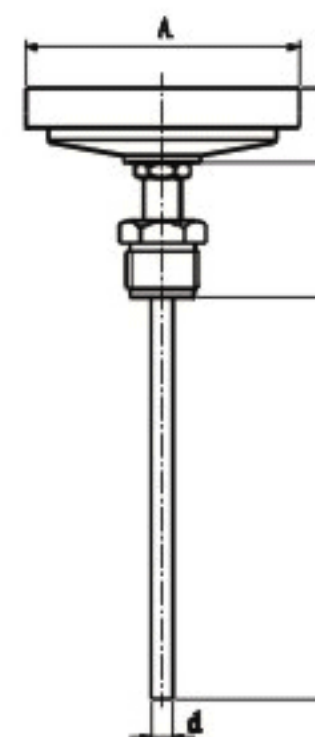


Axial Type

型 号 Type	测温范围 Measuring Range℃	精度等级 Accuracy Class	保护管材料 Protection Tube Material	规格 Specification		安装固定装置 Mounting & Fixing Device
				D	L	
WSS-300	-80~+40	1.5	1Cr18Ni9Ti	Φ60	75	无固定装置 without Fixing Device
WSS-400				Φ100		
WSS-500				Φ150		
WSS-301				Φ60	100	可动外螺纹 Movable Outer Threaded Connector
WSS-401				Φ100		
WSS-501				Φ150		
WSS-302	-80~+40		304	Φ60	150	可动内螺纹 Movable Inner Threaded Connector
WSS-402	0~+80			Φ100	200	
WSS-502				Φ150	300	
WSS-303	0~100		316L	Φ60	400	固定螺纹 Threaded Connector
WSS-403	0~150			Φ100	500	
WSS-503				Φ150	750	
WSS-304			0~200	哈氏 C-276 H Alloy C-276	Φ60	1000
WSS-404	Φ100					
WSS-504	Φ150					
WSS-305	0~400		哈氏 C-276 H Alloy C-276	Φ60	1000	卡套螺纹 Threaded Connector with Fastener
WSS-405	0~500			Φ100		
WSS-505				Φ150		
WSS-306			0~500	哈氏 C-276 H Alloy C-276	Φ60	1000
WSS-406	Φ100					
WSS-506	Φ150					

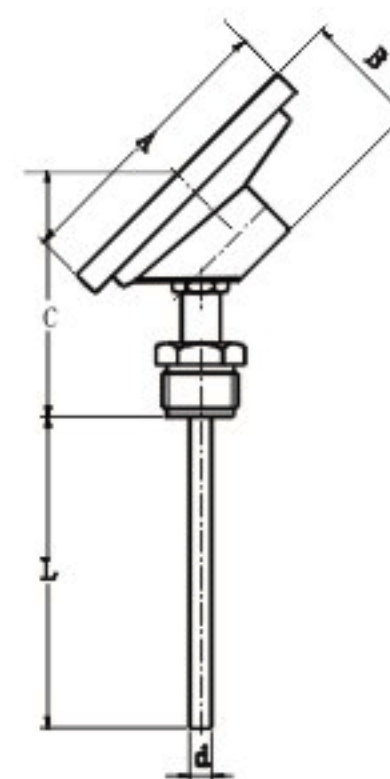


径向型



Radial Type

型 号 Type	测温范围 Measuring Range℃	精度等级 Accuracy Class	保护管材料 Protection Tube Material	规格 Specification		安装固定装置 Mounting &Fixing Devices	
				D	L		
WSS-310				Φ60		无固定装置 without Fixing Device	
WSS-410				Φ100			
WSS-510				Φ150			
WSS-311	-80~+40			Φ60	75	可动外螺纹 Movable Outer Threaded Connector	
WSS-411				Φ100			
WSS-511				Φ150			
WSS-312	-80~+40		1Cr18Ni9Ti	Φ60	100	可动内螺纹 Movable Inner Threaded Connector	
WSS-412				Φ100	150		
WSS-512				Φ150	200		
WSS-313	0~+80	1.5	304	Φ60	300	固定螺纹 Threaded Connector	
WSS-413	0~100		316	Φ100	400		
WSS-513				Φ150	500		
WSS-314	0~150		316L	Φ60	1000	固定法兰 Fixed Flange	
WSS-414	0~200			Φ100			
WSS-514				Φ150			
WSS-315	0~400		哈氏 C-276 H · Alloy C-276	Φ60		卡套螺纹 Threader Connector with Fastener	
WSS-415			Φ100				
WSS-515			Φ150				
WSS-316	0~500			Φ60		卡套法兰 Flange with Fastener	
WSS-416				Φ100			
WSS-516				Φ150			



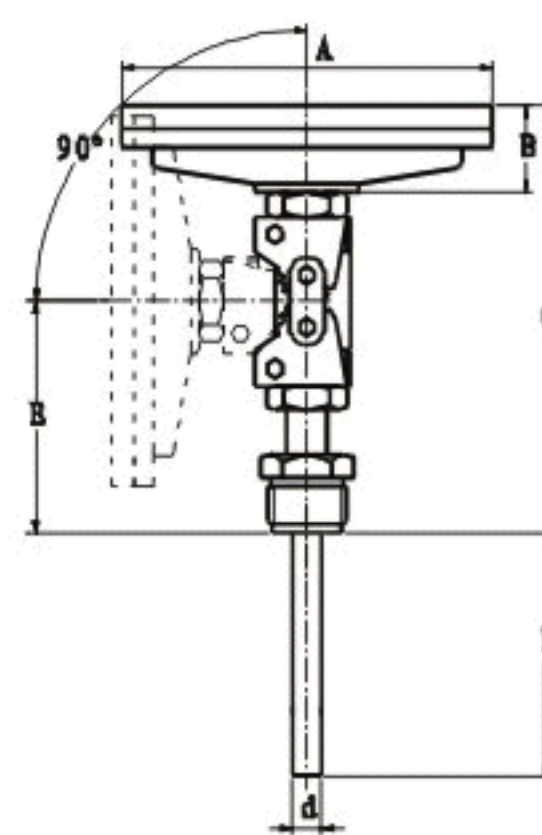
135° 向型

135° Angle Type

型 号 Type	测温范围 Measuring Range℃	精度等级 Accuracy Class	保护管材料 Protection Tube Material	规格 Specification		安装固定装置 Mounting & Fixing Devices
				D	L	
WSS-420	-80~+40	1.5	1Cr18Ni9Ti	Φ100	75	无固定装置 without Fixing Device
WSS-520				Φ150		可动外螺纹 Movable Outer Threaded Connector
WSS-421				Φ100		
WSS-521	-40~+80			Φ150	100	可动内螺纹 Movable Inner Threaded Connector
WSS-422	0~50			Φ100	150	固定螺纹 Threaded Connector
WSS-522	0~100		320	Φ150	200	
WSS-432	0~150		316	Φ100	300	
WSS-532	0~200		316L	Φ150	400	固定法兰 Fixed Flange
WSS-424	0~300		哈氏 C-276	Φ100	500	
WSS-524	0~400		H · Alloy C-276	Φ150	750	
WSS-425	0~500			Φ100	1000	卡套螺纹 Threaded Connector with Fastener
WSS-525				Φ150	卡套法兰 Flange with Fastener	
WSS-426				Φ100		
WSS-526					Φ150	



万向型



Universal Type

型 号 Type	测温范围 Measuring Range℃	精度等级 Accuracy Class	保护管材料 Protection Tube Material	规格 Specification		安装固定装置 Mounting & Fixing Devices
				D	L	
WSS-480	-80~+40	1.5	1Cr18Ni9Ti 320 316 316L 哈氏 C-276 H · Alloy C-276	Φ100	75 100 150 200 300 400 500 750 1000	无固定装置 without Fixing Device
WSS-580				Φ150		可动外螺纹 Movable Outer Threaded Connector
WSS-481				Φ100		
WSS-581	Φ150					
WSS-482	0~50			Φ100		可动内螺纹 Movable Inner Threaded Connector
WSS-582	0~100			Φ150		
WSS-482	0~150			Φ100		
WSS-582	0~200			Φ150		固定螺纹 Threaded Connector
WSS-484	0~300			Φ100		
WSS-584	0~400			Φ150		固定法兰 Fixed Flange
WSS-485	0~500			Φ100		
WSS-585				Φ150		卡套螺纹 Threaded Connector with Fastener
WSS-486				Φ100		
WSS-586				Φ150		卡套法兰 Flange with Fastener

选型须知

- 1) 型号
- 2) 表盘直径
- 3) 精度等级
- 4) 安装固定形式
- 5) 测温范围
- 6) 长度或插入深度

例A: 万向型, 表盘直径 100, 测温范围 0~400℃, 1.5级 活动外螺纹 M27 × 2, 长度 450mm, WSS-481 0~400 L=450 M27× 2

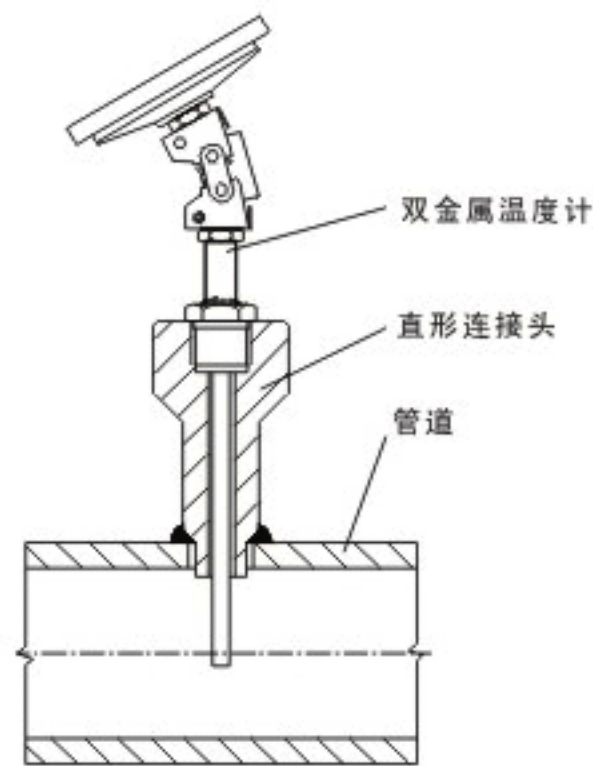
Notices in Type Selection

- 1) Type
- 2) Dial Diameter
- 3) Accuracy Class
- 4) Mounting & Fixing
- 5) Measuring Range
- 6) Length or Insert Length

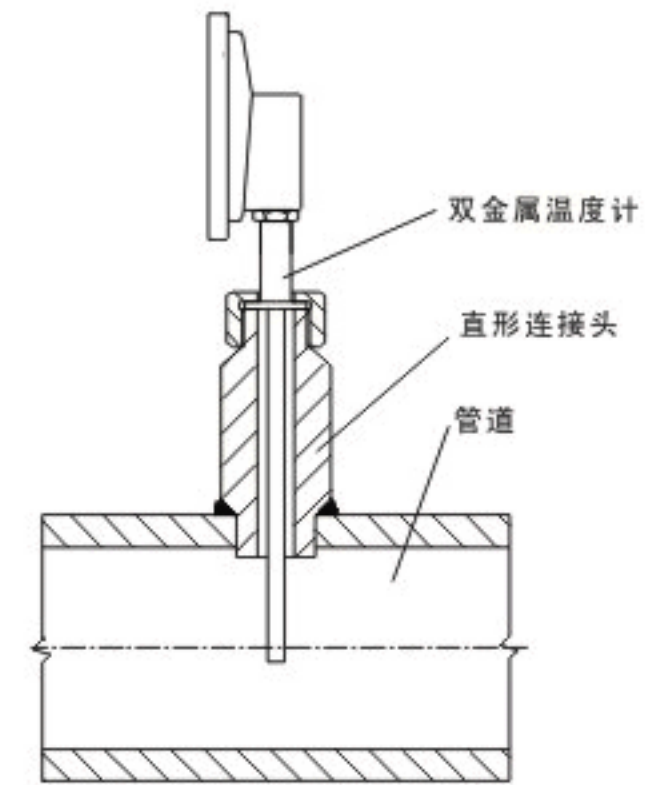
Example A: Universal type, 100 for dial diameter, measuring range 0~400℃, class 1.5, movable outer threaded connector M27 2, length 450mm, WSS-481 0~400 L=450 M27× 2

安装形式

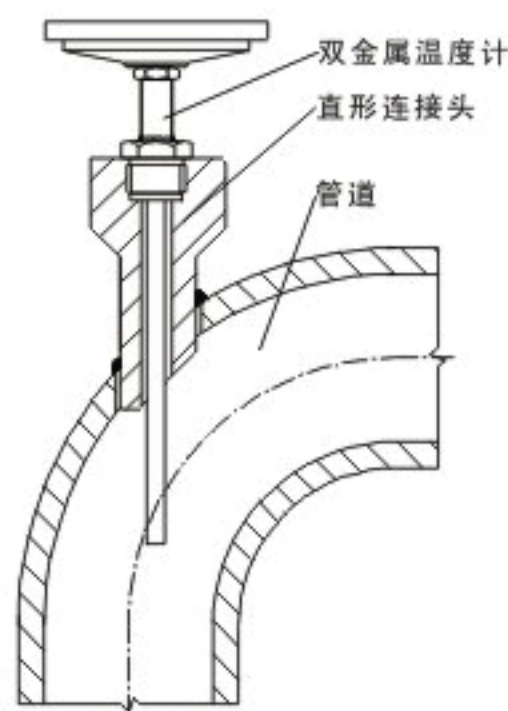
Mounting Figures



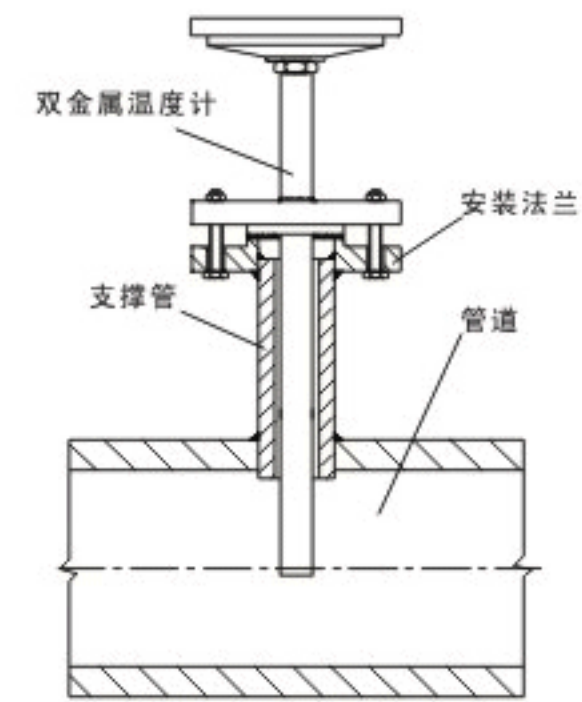
垂直管道安装方法
Vertically mounted into pipe



垂直管道安装方法
Vertically mounted into pipe



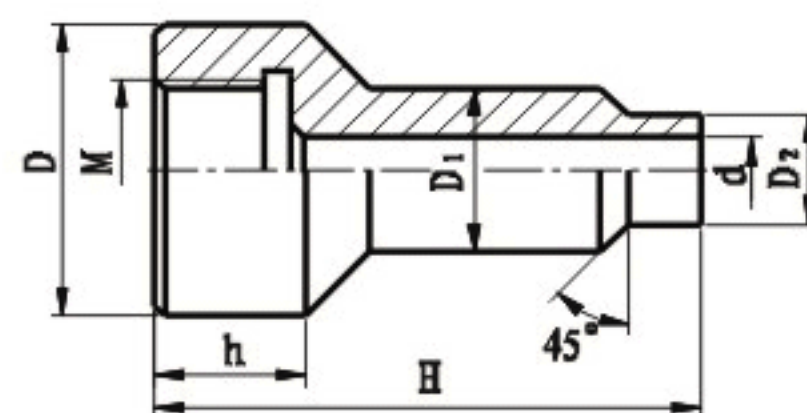
弯曲管道安装方法
Mounted into bent pipe



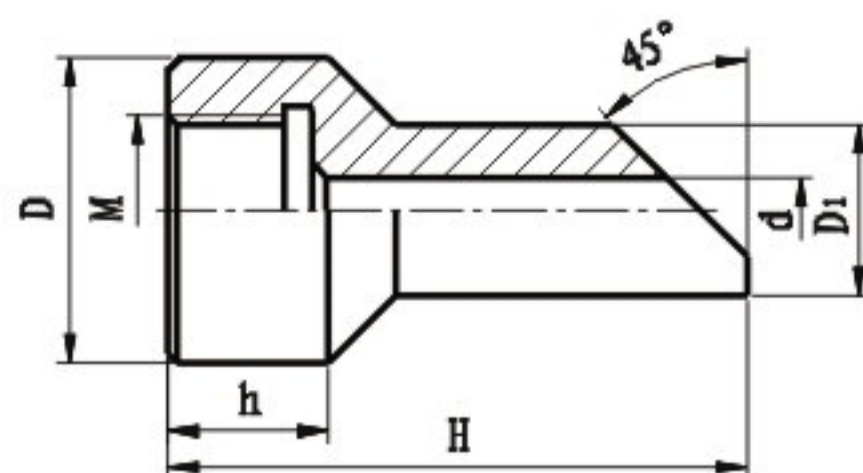
法兰安装方法
Mounted with flange connection

直形连接头规格

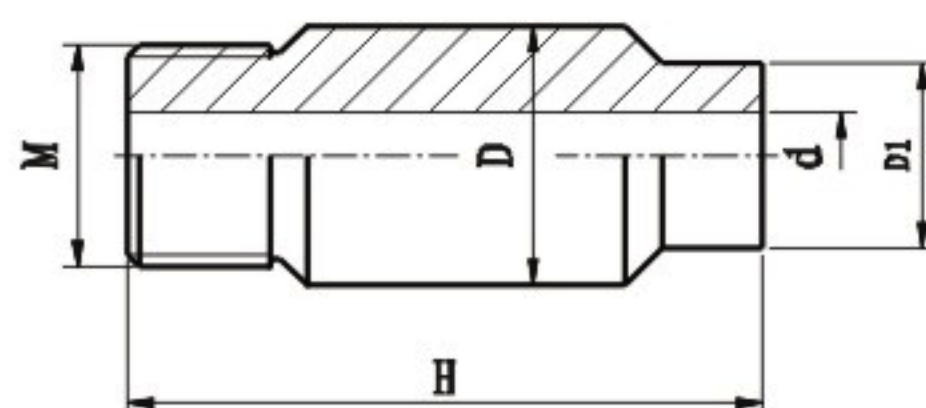
Specification of Straight Connector



代号 Code	M	D	D1	D2	d	h	H
TH48A	M16×1.5	Φ36	Φ18	Φ14	Φ7	2 7	8 0
TH48B	M20×1.5	Φ40	Φ18	Φ14	Φ7	2 7	6 0
TH48C	M27×2	Φ47	Φ28	Φ22	Φ17	3 2	6 0
TH48D	M33×2	Φ55	Φ36	Φ30	Φ21	34	120
TH48E	NPT1/2	Φ39	Φ27	Φ21	Φ16	35	60 120
TH48F	NPT3/4	Φ47	Φ31	Φ25	Φ20	40	
TH48G	NPT1	Φ47	Φ41	Φ35	Φ30	45	



代号 Code	M	D	DI	d	h	H
TH49A	M27× 2	Φ47	Φ28	Φ18	30	90
TH49B	M33× 2	Φ55	Φ36	Φ24	30	150
TH49C	NPT 1/2	Φ39	Φ27	Φ16	30	90
TH49D	NPT 3/4	Φ47	Φ31	Φ20	35	90
TH49E	NPT 1	Φ47	Φ41	Φ30	40	150



代号 Code	M	D	DI	d	H
TH50A	M16× 1.5	Φ26	Φ28	Φ18	90
TH50B	M20× 1.5	Φ30	Φ36	Φ24	150
TH50C	M27× 2	Φ37	Φ27	Φ16	90
TH50D	NPT 1/4	Φ16	Φ31	Φ20	90 150
TH50E	NPT 1/2	Φ21	Φ41	Φ30	
TH50F	NPT 3/4	Φ34	Φ41	Φ30	

电接点双金属温度计

Electric Contact Bimetallic Thermometer

应用

电接点双金属温度计应用于生产现场对温度需自动控制 and 报警。直接测量各种生产过程中的 $-80^{\circ}\text{C} \sim +500^{\circ}\text{C}$ 范围内液体、蒸汽和气体介质温度。

特点

1. 现场显示温度，直观方便；
2. 具有自动切断电源和报警功能；
3. 安全可靠，使用寿命长；
4. 多种结构形式，可满足不同要求；

工作原理

电接点双金属温度计是利用温度变化时带动触点变化，当其上下限触点接触或断开的同时，使电路中的继电器动作，从而自动控制及报警。

主要技术参数

产品执行标准

JB/T8803-1998

GB3836-83

标度盘公称直径：100

精度等级：(1.0), 1.5

热响应时间： $\leq 40\text{s}$

防护等级：IP55

电气参数

额定功率 VA Rated Power VA	最高工作电压 V Max, Working Voltage V	最大允许电流 Max, Allowed Current
10	220 a.c	0.7A
	24 d.c	

绝缘电阻

Insulation Resistance

额定电压 Rated Voltage	直流试验电压 Testing Voltage (D.C)	绝缘电阻 Insulation Resistance
24d.c	100	7
220a.c	500	20

正常工作大气条件

温度 $-25 \sim +55^{\circ}\text{C}$ 相对湿度 $\leq 85\%$

Normal Ambient Condition:

Temperature $-25 \sim +55^{\circ}\text{C}$; Relative Humidity $\leq 85\%$

设定点误差

设定点误差应不超过基本误差限的 1.5 倍切换差

切换差应不超过基本误差限的 1.5 倍

Setting Point Error:

It shall be no more than 1.5 times of basic error limit Switch

Error:

It shall be no more than 1.5 times of basic error limit

切换重复性

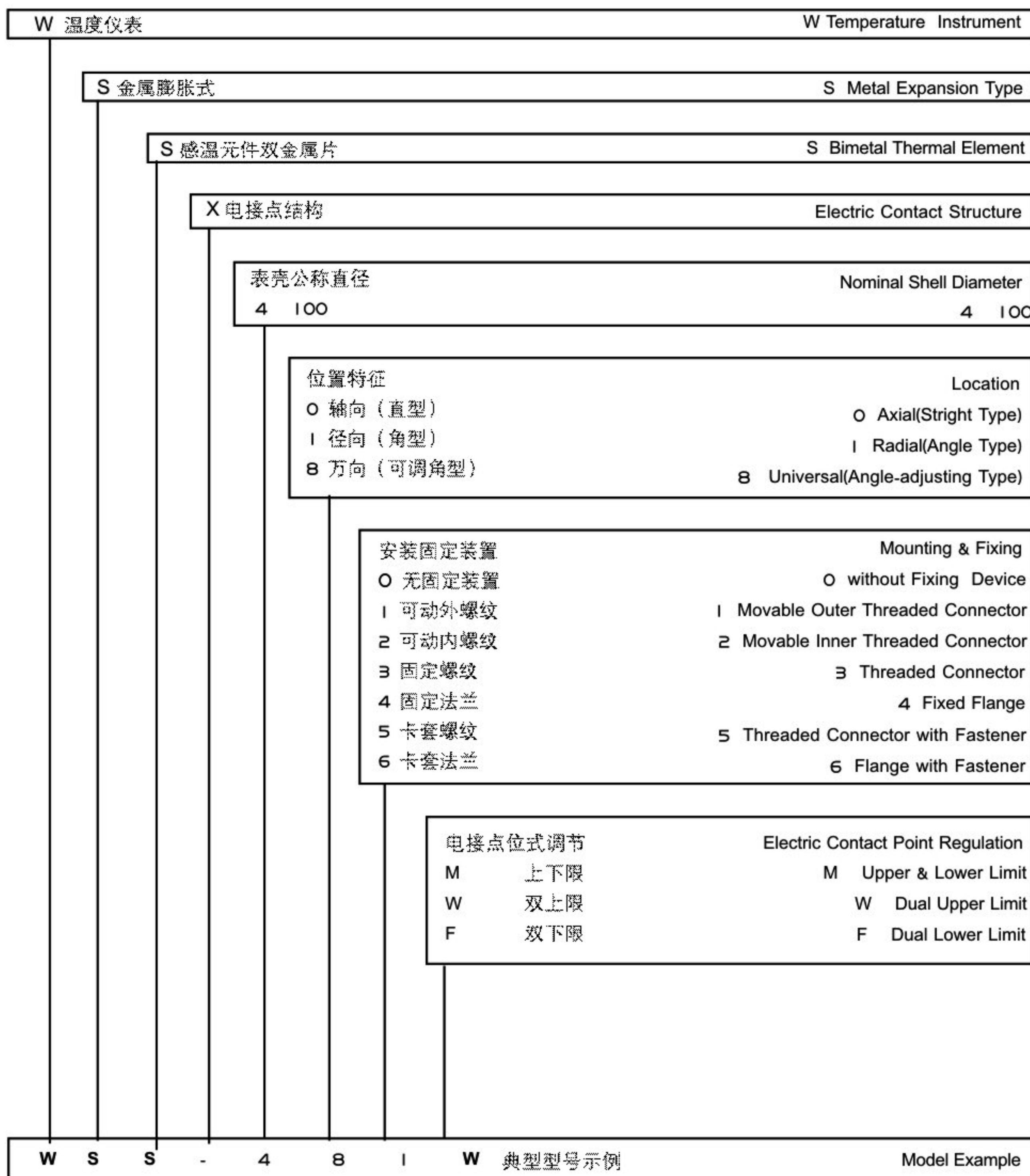
切换重复性极限范围不大于基本误差限绝对值 1/2

Switch Repetition:

It shall be no more than half of absolute value of basic error limit

型号命名方法

Type Naming Method

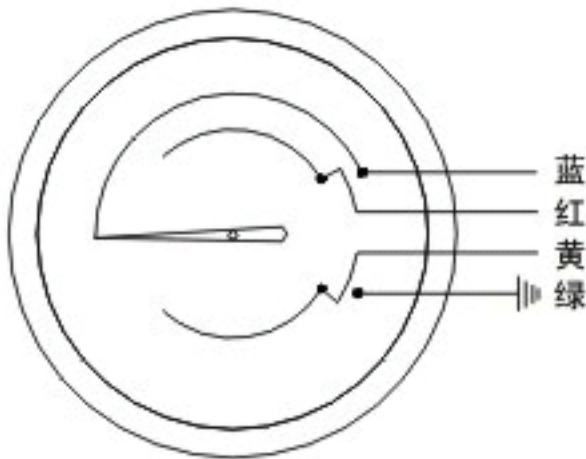


型号及规格
Type & Specification

型 号 Type	测温范围 Measuring Range℃	精度等级 Accuracy Class	保护管材料 Protection Tube Material	规格 Specification L	安装固定装置 Mounting & Fixing Devices
WSSX-400	-80~+40				无固定装置螺纹 without Fixing Device
WSSX-410					
WSSX-480					
WSSX-401	-40~+80			75	可动外螺纹 Movable Outer Threaded Connector
WSSX-411					
WSSX-481					
WSSX-402	0~+50	1.5	1Cr18Ni9Ti	150	可动内螺纹 Movable Inner Threaded Connector
WSSX-412	0~100		304	200	
WSSX-482			316	300	
WSSX-403	0~150			400	固定螺纹 Threaded Connector
WSSX-413				500	
WSSX-483	0~200		哈氏 C-276 H · Alloy C-276	750	
WSSX-404	0~300			1000	固定法兰 Fixed Flange
WSSX-414					
WSSX-484					
WSSX-405	0~400				卡套螺纹 Threaded Connector with Fastener
WSSX-415					
WSSX-485					
WSSX-406	0~500				卡套法兰 Flange with Fastener
WSSX-416					
WSSX-486					

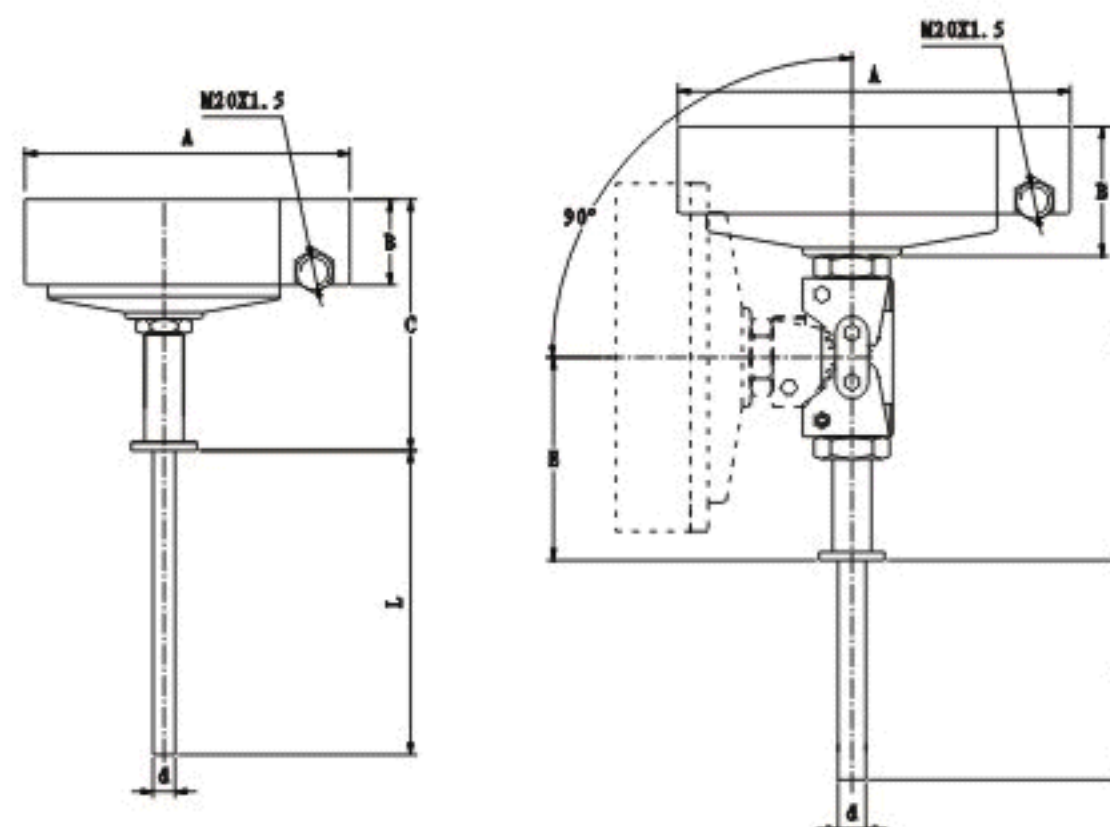
注：特殊形式可根据协议订货：Note: We may provide those of special type as user's demand.

电接点接线方式 Wiring Method



隔爆双金属温度计

Explosion-separation Bimetallic Thermometer



应用

双金属温度计可以直接测量生产现场存在碳氢化合物等爆炸物各过程中的 -80°C ~ $+500^{\circ}\text{C}$ 范围内体、蒸汽和气体介质以及固体表面测温。

Application

It is used to directly measure temperature of liquid, vapor, gas and solid surface ranging from -80°C to $+500^{\circ}\text{C}$, with explosives such as hydrocarbon on production spot.

主要技术参数

标度盘公称直径: 100
热响应时间: $\leq 40\text{s}$
隔爆等级: d II BT4
额定功率: 10VA
最高工作电压: 220V
最高工作电流: 0.7A

Technical Parameters

Nominal Diameter of Dial: 100
Thermal Response Time: $\leq 40\text{s}$
Explosion-separation Class: d II BT4
Rated Power: 10VA
Max. Working Voltage: 220V
Max. Working Current: 0.7A

外形及尺寸 Figure & Size

形式 Structure	D	A	B	E	d
电接点轴向型 Axial Type with Electric Contact	130	65	190		$\Phi 8$
电接点万向型 Universal Type with Electric Contact	130	60	215	110	$\Phi 10$

型号及规格 **Type & Specification**

型 号 Type	测温范围 Measuring Range℃	精度等级 Accuracy Class	保护管材料 Protection Tube Material	规格 Specification L	安装固定装置 Mounting & Fixing Devices
WSSX-410B	-80~+40	1.5	1Cr18Ni9Ti	75	无固定装置螺纹 without Fixing Device
WSSX-480B					可动外螺纹 Movable Outer Threaded Connector
WSSX-411B					可动内螺纹 Movable Inner Threaded Connector
WSSX-481B	-40~+80		304	100	固定法兰 Fixed Flange
WSSX-412B	0~+50			150	
WSSX-482B	0~100			200	
WSSX-413B	0~150		316	300	固定螺纹 Threaded Connector
WSSX-483B	0~200			400	
WSSX-414B	0~300			500	
WSSX-484B	0~400		哈氏 C-276 H·Alloyc-276	750	卡套螺纹 Threaded Connector with Fastener
WSSX-415B	0~500			1000	
WSSX-485B					
WSSX-416B			316L		卡套法兰 Flange with Fastener
WSSX-486B					

注:特殊形式可根据协议订货:

Remarks: We may provide those of special type as user's demand.

选型须知

- 1) 型号
- 2) 精度等级
- 3) 测温范围
- 4) 电接点位式调节
- 5) 安装固定形式
- 6) 插入长度

例 A: 防爆型万向式双金属温度计, 位式调节上下限,
测温范围 0~400℃, 保护管 316 插入长度 300mm,
WSSX-481BM 0~400 I=300 保护管 316

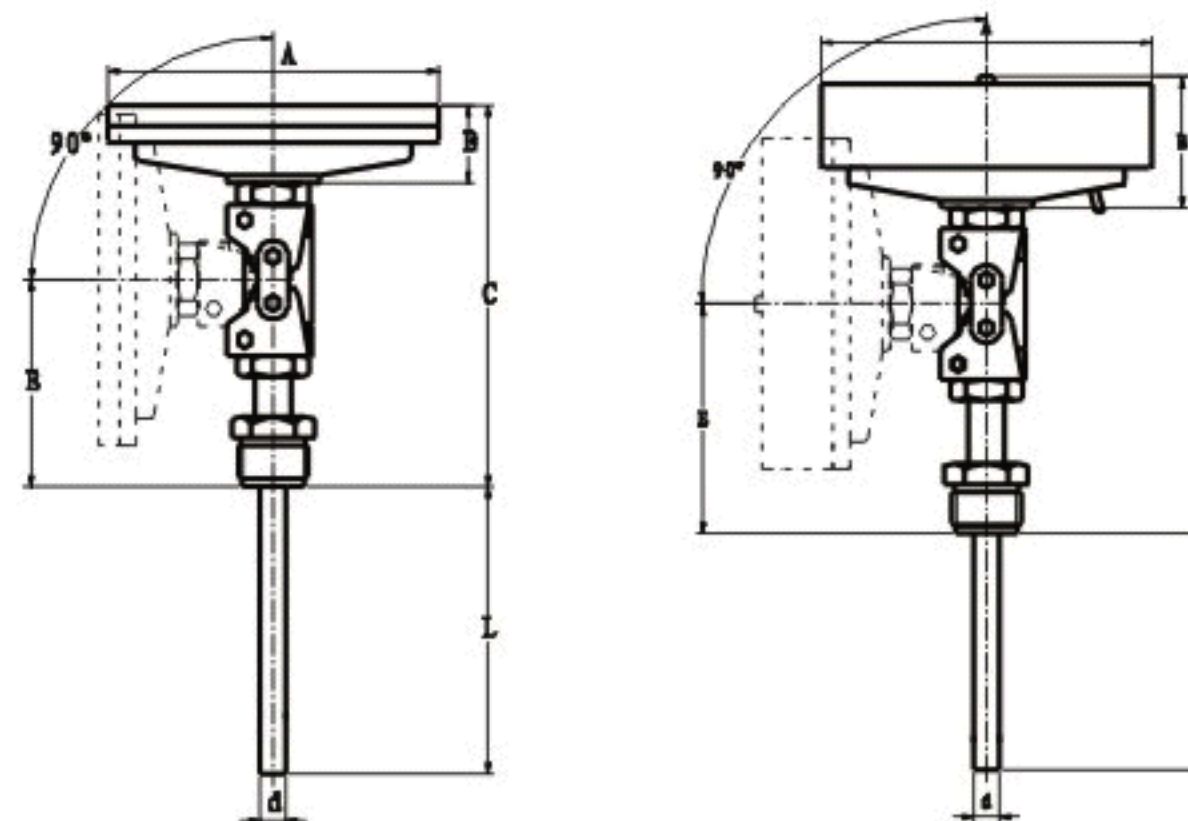
Notices in Type Selection

- 1) Type
- 2) Accuracy Class
- 3) Measuring Range
- 4) Electric Contact Regulation
- 5) Mounting & Fixing
- 6) Insert Length

Example A: explosion-separation universal type bimetallic thermometer,
upper & lower limit regulation, measuring range 0~400℃,
protection tube 316, insert length 300mm
WSSX-481BM 0~400 I=300 protection tube 316

热套式双金属温度计

Bimetallic Thermometer with Protection Tube



应用

双金属温度计可配合各式安装套管，满足不同压力等级要求。可以直接测量各种生产过程中的 -80°C ~ $+500^{\circ}\text{C}$ 范围内液体、蒸汽和气体介质以及固体表面测温。

Application

Bimetallic thermometers are matched with different mouning tubes to meet different demands on pressure class. It is used to directly measure temperature of liquid, vapor, gas and solid surface ranging from -80°C to $+500^{\circ}\text{C}$.

主要技术参数

标度盘公称直径: 100
精度等级: (1.0), 1.5
连接尺寸: M20×1.5, NPT1/2
热响应时间: $\leq 40\text{s}$
防护等级: IP55

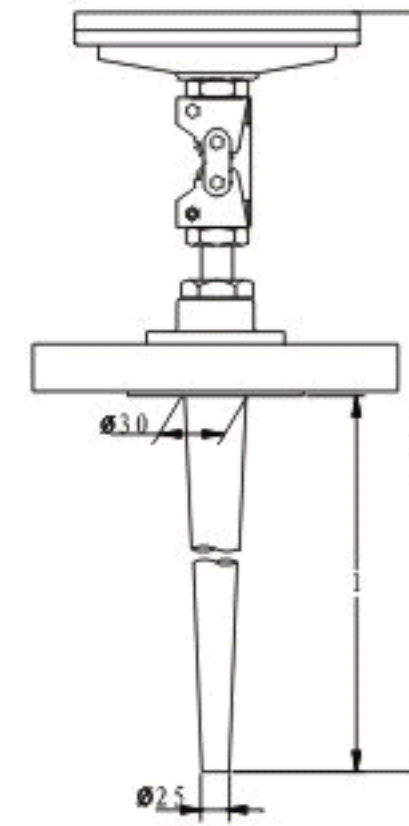
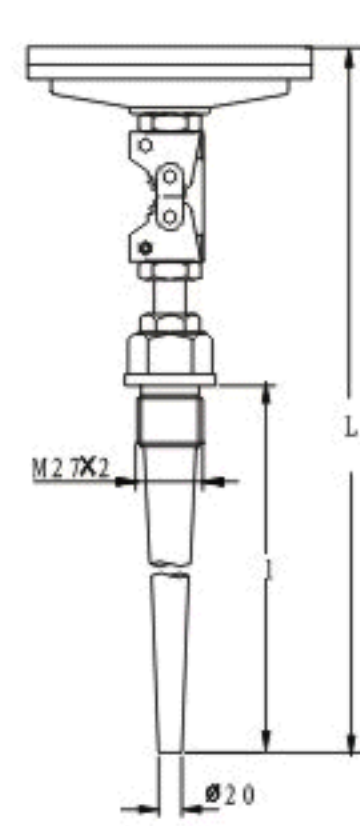
Main Technical Parameters

Nominal Diameter of Dial: 100
Accuracy Class: (1.0), 1.5
Connection Size: M20×1.5, NPT1/2
Thermal Response Time: $\leq 40\text{s}$
Protection Class: IP55

外形及尺寸 Figure & Size

形式 Structure	D	A	B	E	d
径向型 Radial Type	105	23	73		Φ8
	155	23	73		
轴向型 Axial Type	65	50	110	34	
	105	50	110	34	
万向型 Universal Type	105	23	178	120	
	155	23	178	120	
电接点轴向型 Axial Type with Electric Contact	128	40	135		Φ10
电接点径向型 Radial Type with Electric Contact	128	72	150	42	
电接点万向型 Universal Type with Electric Contact	128	40	175	98	

型号及规格 Type & Specification



型号 Type	测温范围 Measuring Range℃	精度等级 Accuracy Class	保护管材料 Protection Tube Material	规格 Specification	公称压力 Nominal Pressure	套管形式 Thermal Sleeve Form
WSS-403S	-80~+40	1.5	1Cr18Ni9Ti	75	≤ 30MPa	螺纹连接式 Threaded Connector
WSS-503S						
WSS-413S						
WSS-513S						
WSS-483S	-40~+80	1.5	304	100	≤ 30MPa	螺纹连接式 Threaded Connector
WSSX-413S						
WSSX-483S	0~100	1.5	316	200	≤ 30MPa	螺纹连接式 Threaded Connector
WSS-403L	0~150					
WSS-503L	0~200	1.5	316L	300	150~40MPa	法兰连接式 Flange Connection
WSS-413L	0~300					
WSSX-513L	0~400					
WSS-483L	0~500					
WSS-583L	0~500	1.5	哈氏 C-276 H.AlloyC-276	300	150~40MPa	法兰连接式 Flange Connection
WSSX-403L						
WSSX-483L						

注: 1) 可配各式安装套管, 热安装套管形式详见 P198
 2) 保护管其材质根据协议订货;
 3) 打“*”表示公称压力根据法兰压力等级而定, 详见 P198

Remarks: 1) It may match with different thermal sleeves. More information about protection tube from P198.
 2) We also produce protection tube of other material as user's demand.
 3) Nominal pressure of those with mark "*" depends on pressure class of flange, see more from P198.

选型须知

Notices in Type Selection

- | | |
|------------|------------------------|
| 1) 型号 | 1) Type |
| 2) 精度等级 | 2) Accuracy class |
| 3) 测温范围 | 3) Measuring range |
| 4) 安装固定形式 | 4) Mounting and fixing |
| 5) 热安装套管形式 | 5) Protection tube |
| 6) 插入长度 | 6) Insert length |

例 A: 万向式双金属温度计, 测温范围 0~400℃, 热安装套管 TH01F, 插入长度 300mm, WSS-483TH01F 0~400℃ l=300

Example A: universal type bimetallic thermometer, measuring range 0~400℃, thermal sleeve TH01F, insert length 300mm, WSS-483TH01F 0~400℃ l=300

带热电偶(阻)双金属温度计

Bimetallic Thermometer with Thermocouple (Thermal Resistance)



应用

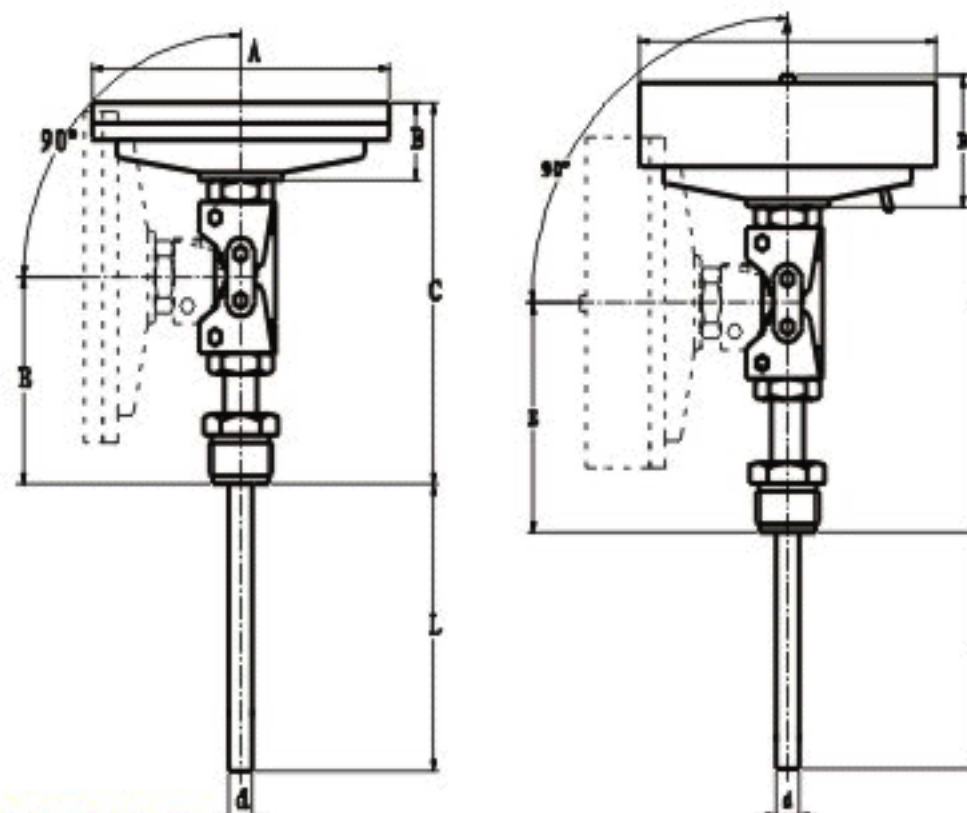
采用双金属温度计与热电偶(阻)一体的方式,既满足现场测温需求,亦满足远距离传输需求。可以直接测量各种生产过程中的 $-80^{\circ}\text{C}\sim+500^{\circ}\text{C}$ 范围内液体、蒸汽和气体介质以及固体表面测温。

主要技术参数

- 1.标度盘公称直径:100,150
- 2.热响应时间: $\leq 40\text{s}$
- 3.精度等级:(1.0),1.5
- 4.热电偶:I级,1.5 $^{\circ}\text{C}$; II级,2.5 $^{\circ}\text{C}$
- 5.热电阻:A级, $\pm(0.15+0.005\text{ItI})$
级, $\pm(0.30+0.005\text{ItI})$
- 6.防护等级:IP55

外形及尺寸 Figure & Size

形式 Structure	D	A	B	E	d
径向型 Radial Type	105	23	73		$\Phi 10$
	155	23	73		
轴向型 Axial Type	105	50	110	34	
	155	50	110	34	
万向型 Universal Type	105	23	178	120	
	155	23	178	120	
电接点轴向型 Axial Type with Electric Contact	105	40	135		$\Phi 14$
电接点径向型 Radial Type with Electric Contact	105	72	150	42	
电接点万向型 Universal Type with Electric Contact	105	40	175	98	



Application

We adopt integral design for bimetallic thermometer with thermocouple (thermal resistance) to measure temperature on the spot or for long-range transmission. It is used to measure the temperature of liquid, vapor, gas and solid surface ranging from -80°C to $+500^{\circ}\text{C}$.

Main Technical Parameters

- 1.Nominal Diameter of Dial:100,150
- 2.Thermal Response Time: $\leq 40\text{s}$
- 3.Accuracy Class:(1.0),1.5
- 4.Thermocouple: Class I,1.5 $^{\circ}\text{C}$; Class II,2.5 $^{\circ}\text{C}$
- 5.Thermal Resistance:Class A, $\pm(0.15+0.005\text{ItI})$
Class B, $\pm(0.30+0.005\text{ItI})$
- 6.Protection Class:IP55

型号及规格 Type & Specification

型 号 Type	分度号 Graduation	测温范围 Measuring Range℃	精度等级 Accuracy Class	保护管材料 Protection Tube Material	插入长度 Insert Length
WSSE-40 I	E	-80~+40	1.5	1Cr18Ni9Ti 304 316 316L 哈氏 C-276 H.Alloy C-276	150 200 300 400 500 750 1000
WSSE-50 I					
WSSE-4 I I					
WSSE-5 I I					
WSSE-48 I					
WSSE-58 I					
WSSP-40 I	Pt100	0~50	1.5	哈氏 C-276 H.Alloy C-276	150 200 300 400 500 750 1000
WSSP-50 I		0~100			
WSSP-4 I I		0~150			
WSSP-5 I I		0~200			
WSSP-48 I		0~300			
WSSP-58 I		0~400			
WSSXE-40 I	E	0~400	1.5	哈氏 C-276 H.Alloy C-276	150 200 300 400 500 750 1000
WSSXP-40 I	Pt100	0~500			
WSSXE-4 I I	E				
WSSXP-4 I I	Pt100				
WSSXE-48 I	E				
WSSXP-48 I	Pt100				

注: 1) 热电偶 I 级, 热电阻 A 级按协议订货
2) 保护管其余材质根据协议订货;

Remarks: 1) Class I thermocouple and class A thermal resistance shall be ordered according to agreement.
2) We also produce protection tube of other material.

选型须知

- 1) 型号
- 2) 热电偶(阻)分度号
- 3) 热电偶(阻)精度等级
- 4) 双金属温度计精度等级
- 5) 测温范围
- 6) 安装固定形式
- 7) 保护管材质
- 8) 长度或插入长度

例 A: 带热电偶双金属温度计, 轴向型, E 型, I 级, 测温范围 0~400℃, 活动螺纹 M27 × 2, 保护管 316 插入长度 300mm, WSSE-40 I 0~400 I=300 级 保护管 316

Notices in Type Selection

- 1) Type
- 2) Thermocouple (Thermal Resistance) Graduation
- 3) Accuracy Class of Thermocouple (Thermal Resistance)
- 4) Accuracy Class of Bimetallic Thermometer
- 5) Measuring Range
- 6) Mounting & Fixing
- 7) Protection Tube Material
- 8) Length or Insert Length

Example A: bimetallic thermometer with thermocouple, axial structure, E type, class I, measuring range 0~400℃, movable threaded connector M27 × 2, protection tube 316, insert length 300mm WSSE-40 I 0~400 I=300 Class I Protection Tube 316

热安装套管

Protection Tube

应用

与两节式热电偶(阻)和双金属温度计配套使用,保护热电偶(阻)和双金属温度计正常工作。且可用于高压高流速场合。

特点

- 1.全部参照 IEC 国际标准设计
- 2.盲孔加工,耐高压
- 3.与设备同期制造和安装;
- 4.不同压力等级,可满足不同需要;

主要技术参数

公称压力:

一般是指在常温下,保护管所能承受的静态外压而不破裂。允许工作压力不仅与保护管材料、直径、壁厚有关,且与其结构形式、安装方法及被测介质的流速、种类有关。

水压试验

对保护管的耐压和泄漏检查有要求时,须对保护管进行试验。试验压力为保护管耐压等级的 1.5 倍。

X 射线探伤试验

对保护管的壁厚、偏心距等项目检查有要求时,须按用户要求进行检查。

Application

It is matched with thermocouple (thermal resistance) and bimetallic thermometer to ensure their normal operation. It is also used for environment under high pressure or with high flow speed.

Features

- 1.Design according to IEC standard
- 2.Resistance against high pressure
- 3.Be manufactured and installed during the same term with concerned equipments
- 4.Different pressure classes to meet different demands.

Main Technical Parameters

Nominal Pressure

It generally refers to sustainable static pressure from outside on protection tube without breakage. It concerns not only material, diameter, wall thickness of protection tube, but structure and mounting way of the tube, flow speed and category of tested media as well.

Water Pressure Test

It is conducted to checking pressure resistance and leakage of protection tube. Testing pressure shall be 1.5 times of pressure-proof class of protection tube.

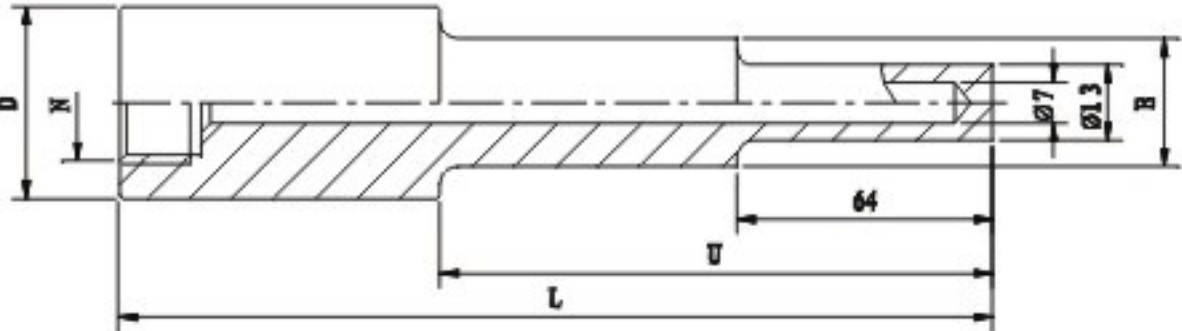
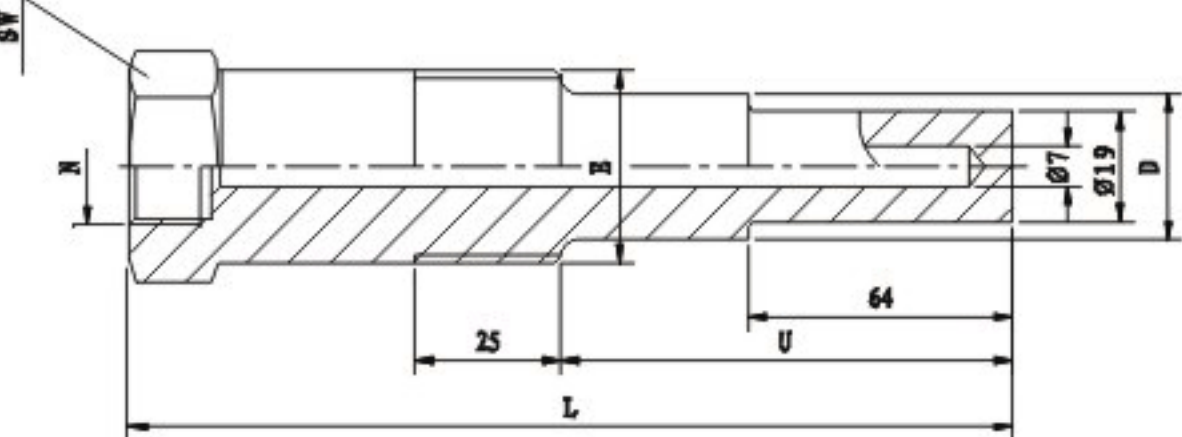
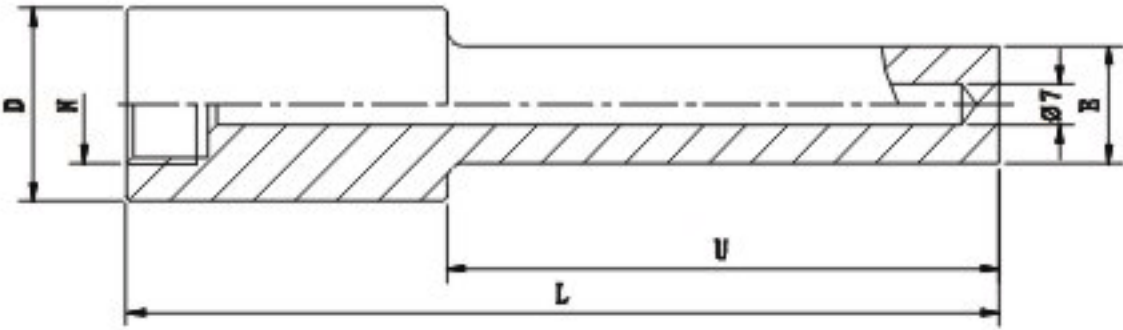
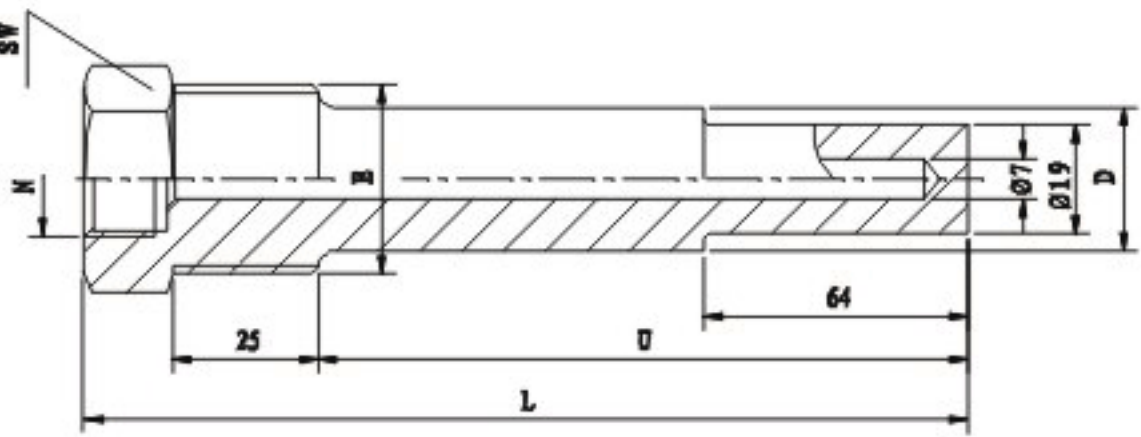
X-ray Flaw-detecting Test

It is conducted as user's demand on checking wall thickness and eccentricity of protection tube.

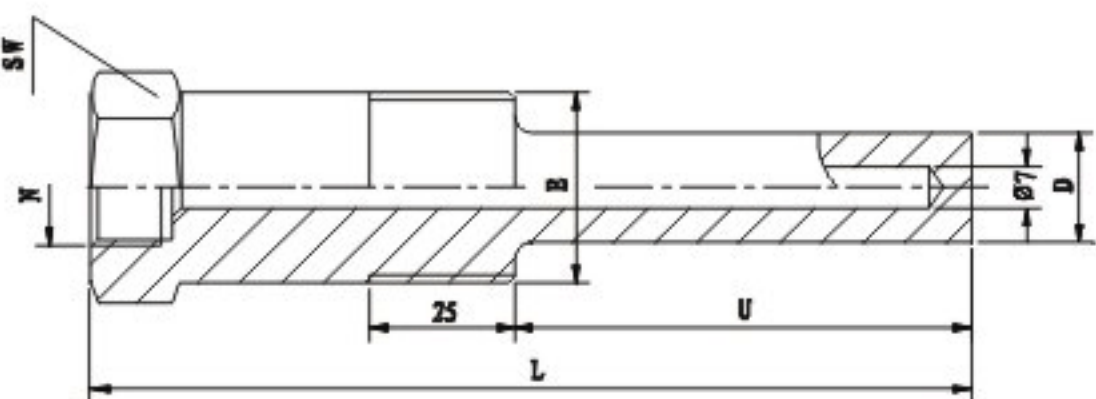
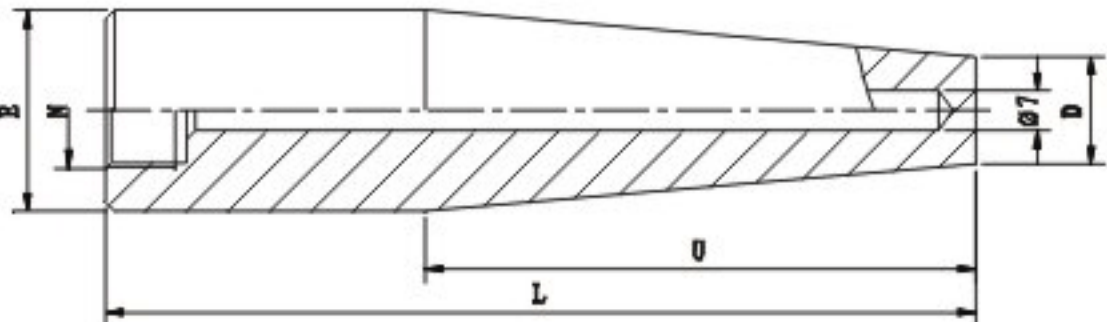
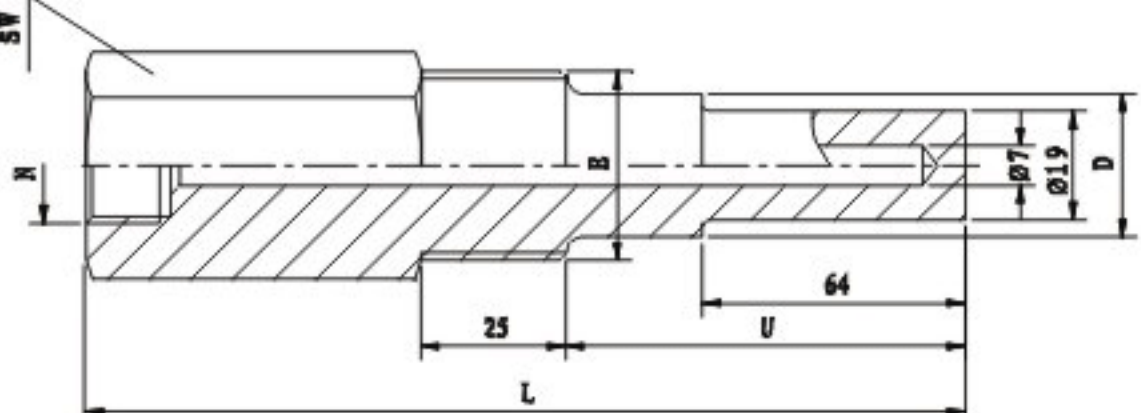
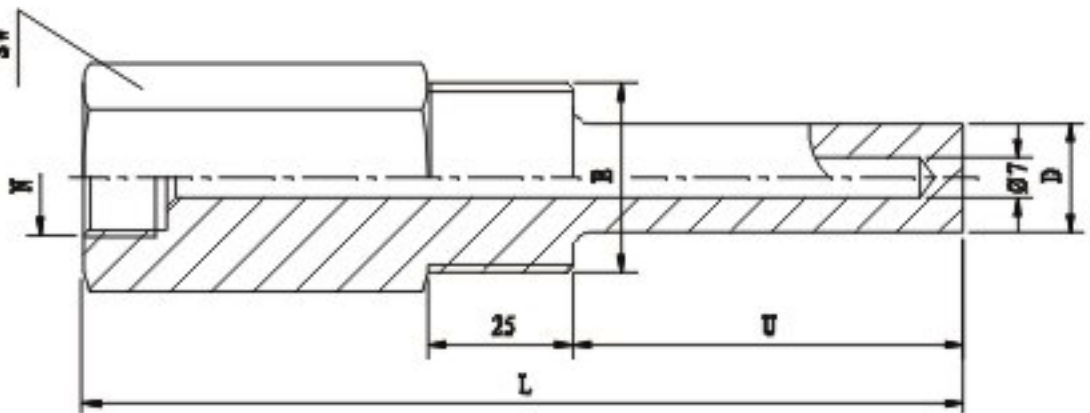
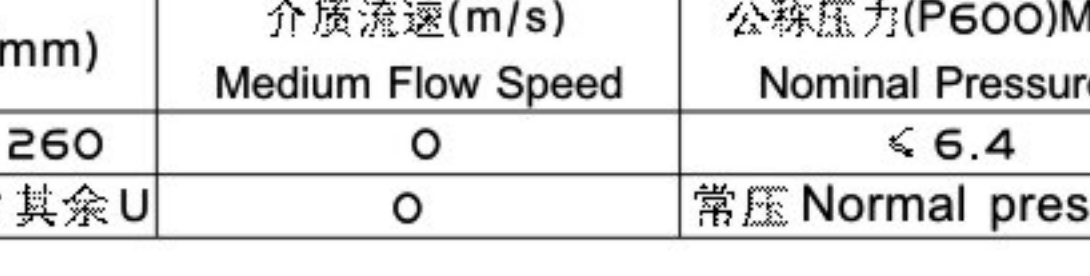
型号命名方法

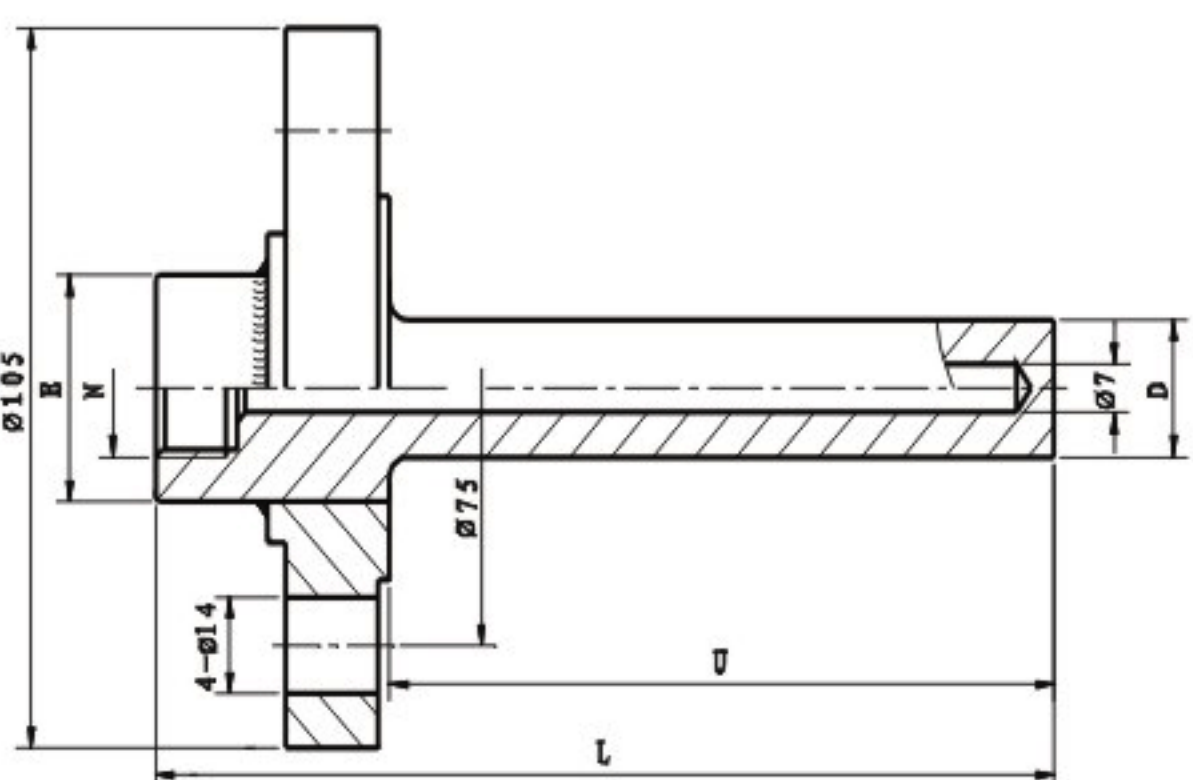
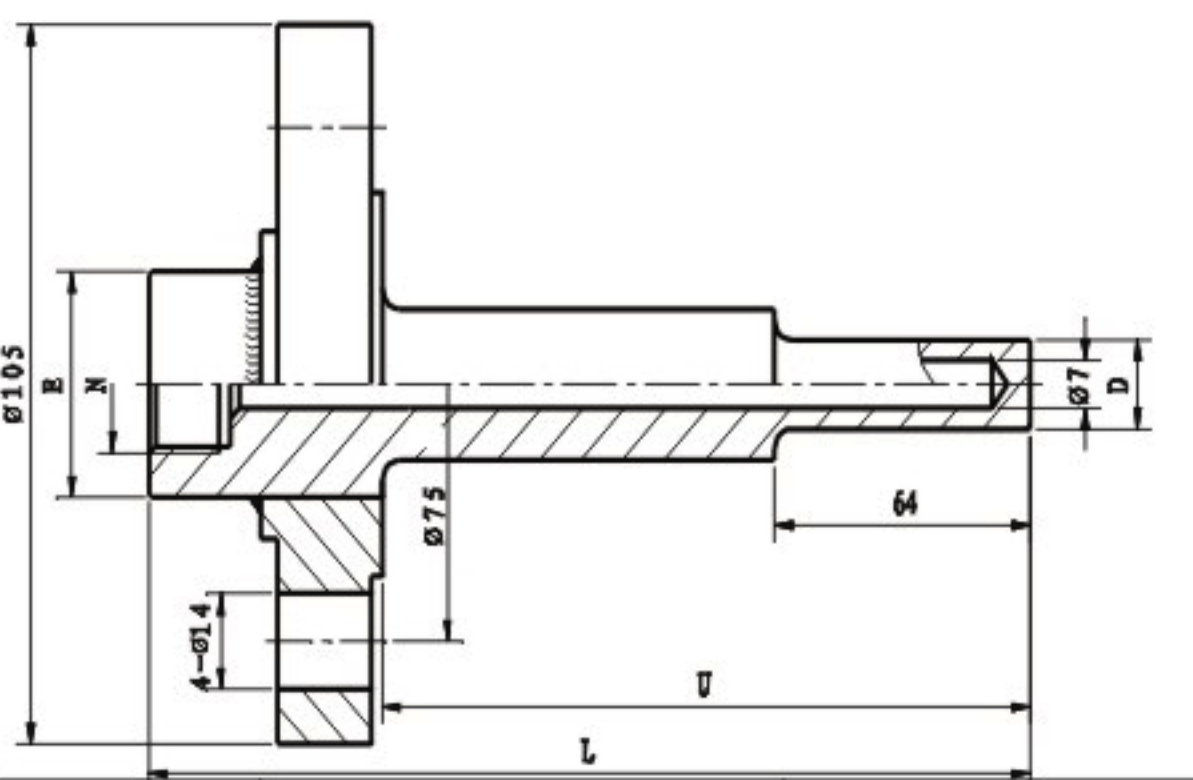
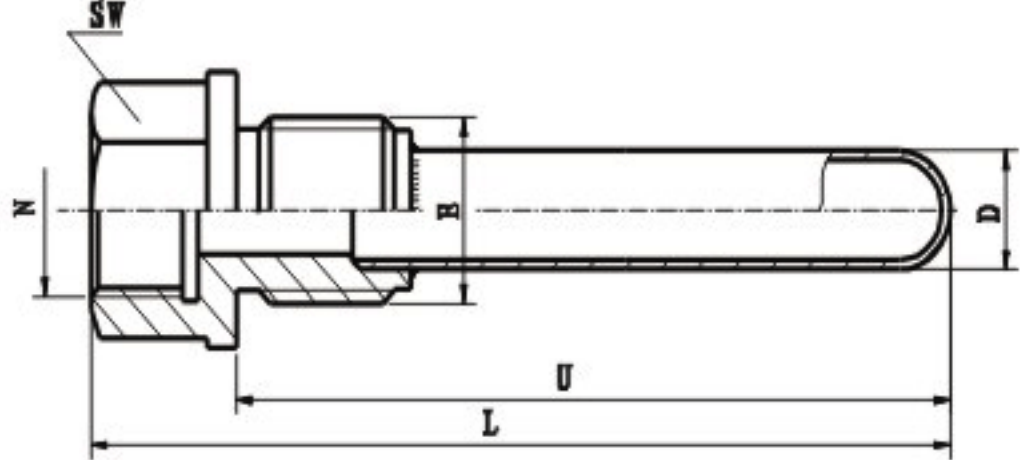
Type Naming Method

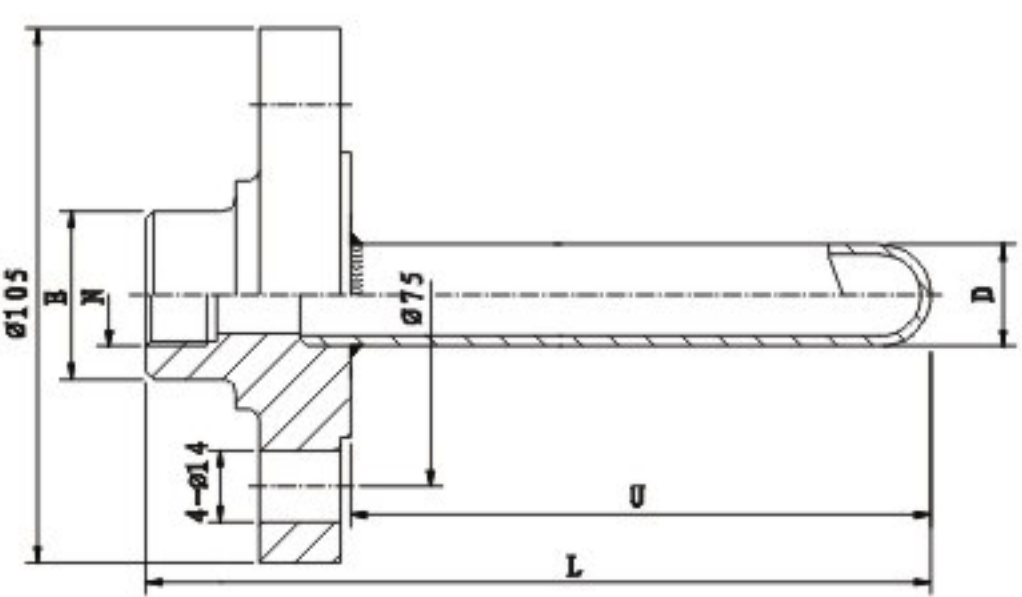
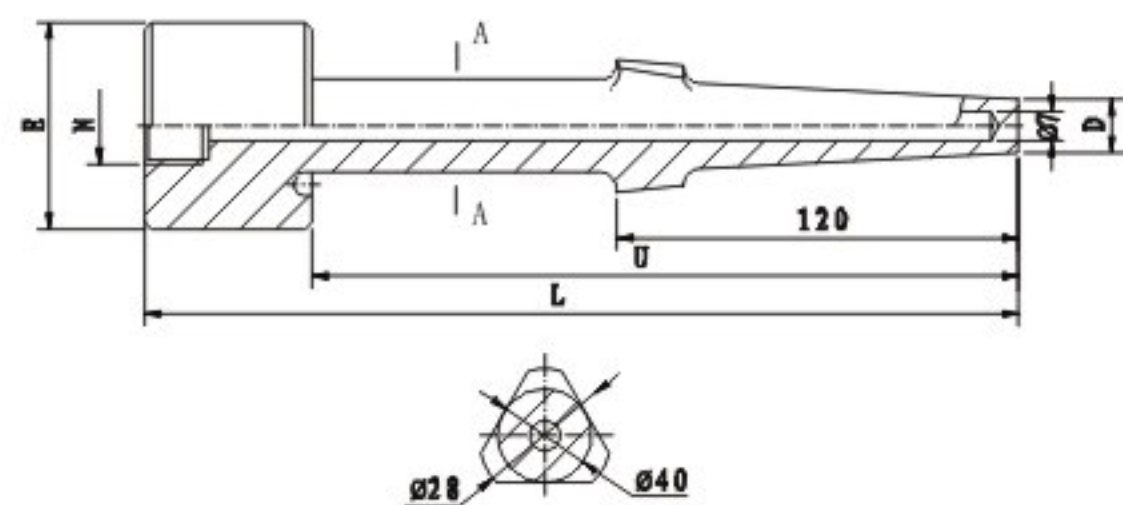
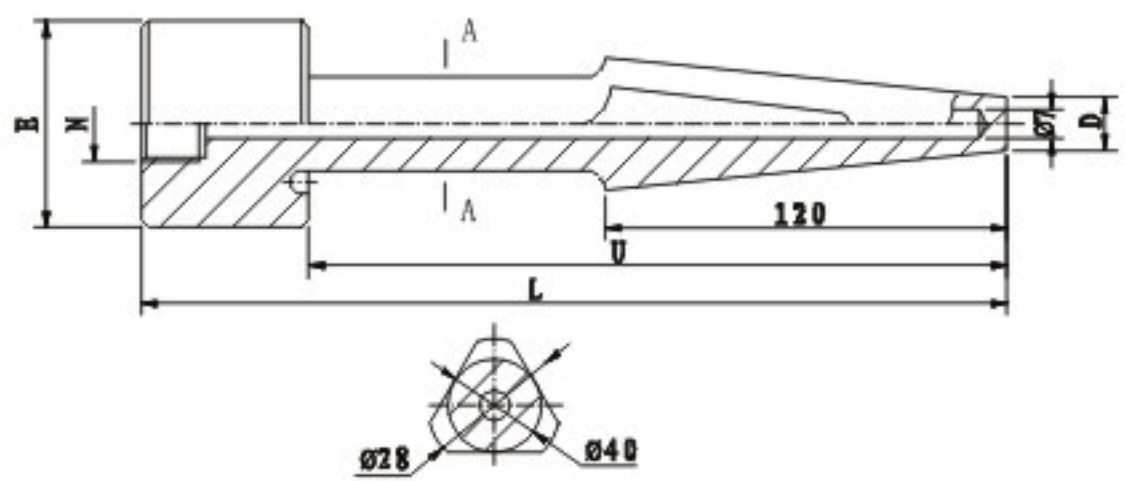
TH 热安装套管				Protection Tube	
连接形式				Connection	
	01	螺纹连接式		Threaded Connector	
	02	法兰连接式		Flange Connection	
	03	焊接式		Welding Connection	
序号			Order Number		
套管材质			Tube Material		
无(未标注)			1Cr18Ni9Ti	blank	1Cr18Ni9Ti
A	304	A	304		
B	316	B	316		
C	316L	C	316L		
D	其它	D	other		
TH	02	A	B	典型型号示例	
				Model Example	

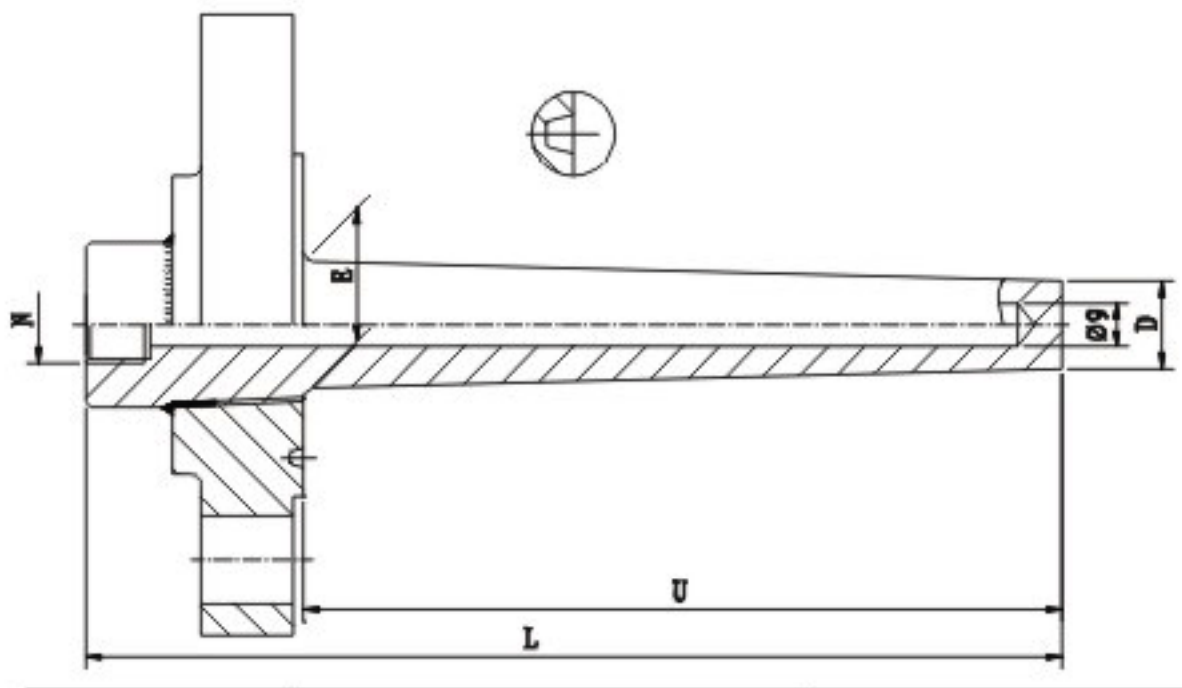
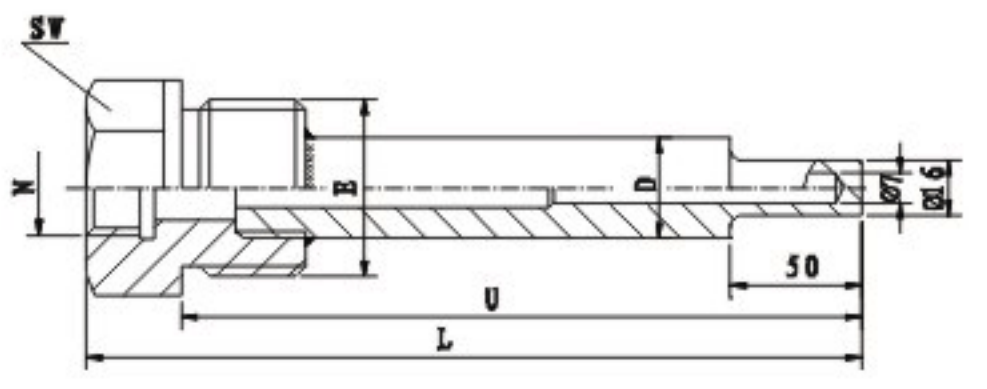
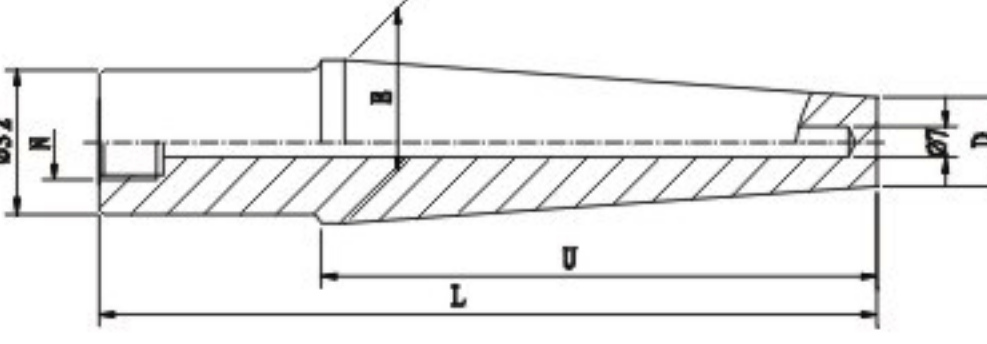
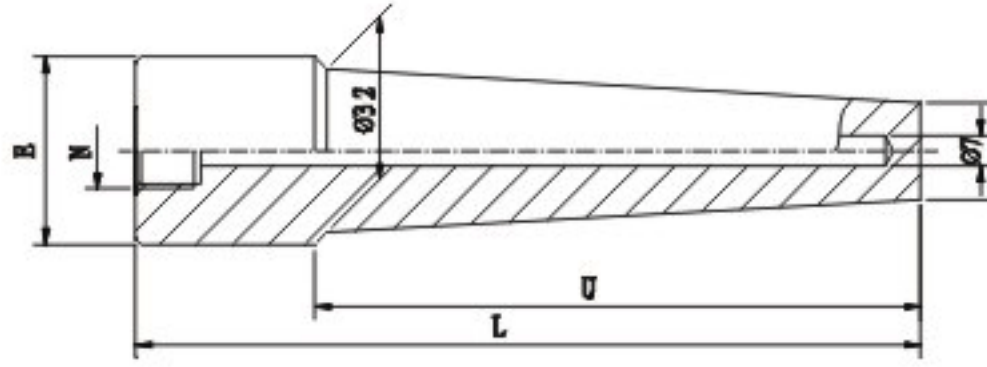
外型及尺寸 Figure & Size			型号 Type	N	E	D	SW	U	L
			TH03A	M20×1.5 (NPT1/2)	NPT3/4	Φ26.5	-	95 145 195 245	150 200 250 300
			TH03B	M20×1.5 (NPT1/2)	Φ19	Φ33.5	-	345 445 545	400 500 600
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
≤ 545	0	≤ 6.4							
			TH01A	M20×1.5 (NPT1/2)	Φ22	Φ25.4	34	60 110 160 210	150 200 250 300
			TH01B	M20×1.5 (NPT1/2)	NPT3/4	Φ22.2		260 360	400 500
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
≤ 360	0	≤ 6.4							
			TH03C	M20×1.5 (NPT1/2)	Φ28	Φ36	-	95 145 195 245	150 200 250 300
			TH03D	M20×1.5 (NPT1/2)	Φ36	Φ41.5		345 445 545	400 500 600
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
≤ 110	≤ 18	≤ 80	TH03C	TH03D	TH03C	TH03D			
≤ 260		≤ 18							
other 其余 U		≤ 6.4							
≤ 360	0	≤ 6.4							
			TH01C	M20×1.5 (NPT1/2)	NPT1	Φ25.4	34	160 210 260 360	200 250 300 400
			TH01D	M20×1.5 (NPT1/2)	NPT3/4	Φ22.2		460 560	500 600
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
≤ 560	0	≤ 6.4							

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外型及尺寸 Figure & Size			型号 Type	N	E	D	SW	U	L
			THOIN	M20×1.5 (NPT1/2)	NPT1	Φ28	34	60 110 160 210 260 360	150 200 250 300 400 500
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
≤ 260	0	≤ 6.4							
other 其余 U	0	常压 Normal pressure							
			THO3E	M20×1.5 (NPT1/2)	Φ28	Φ13	-	100	250
			THO3F	M20×1.5 (NPT1/2)	Φ28	Φ20	-	100	300
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
	THO3E	THO3F	THO3E	THO3F					
≤ 100	≤ 18	≤ 80	≤ 30	≤ 30					
			THO1P	M20×1.5 (NPT1/2)	NPT1	Φ22	34	160 210 260 360	250 300 400 500
			THO1Q	M20×1.5 (NPT1/2)	NPT3/4	Φ19	34	160 210 260 360	250 300 400 500
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
≤ 260	0	≤ 6.4							
other 其余 U	0	常压 Normal pressure							
			THO1R	M20×1.5 (NPT1/2)	NPT1	Φ22	34	60 110 160 210 260 360	150 200 250 300 400 500
			THO1S	M20×1.5 (NPT1/2)	NPT3/4	Φ19	34	60 110 160 210 260 360	150 200 250 300 400 500
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
≤ 260	0	≤ 6.4							
other 其余 U	0	常压 Normal pressure							

外型及尺寸 Figure & Size			型号 Type	N	E	D	SW	U	L
			TH02E	M20×1.5 (NPT1/2)	Φ34	Φ16	—	114 161 211 261 361 461 713 963	144 194 244 294 394 494 784 998
			TH02F	M20×1.5 (NPT1/2)	Φ34	Φ20	—	—	—
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
≤ 260	0	≤ 6.4							
other 其余 U	0	常压 Normal pressure							
			TH03G	M20×1.5 (NPT1/2)	Φ62	Φ16	—	250	300
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
≤ 260	0	≤ 6.4							
other 其余 U	0	常压 Normal pressure							
			TH03H	M20×1.5 (NPT1/2)	Φ62	Φ16	—	250	300
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure							
≤ 260	0	≤ 6.4							
other 其余 U	0	常压 Normal pressure							

外型及尺寸 Figure & Size			型号 Type	N	E	D	SW	U	L
			TH02A	M20× 1.5 (NPT 1/2)	Φ41.5	Φ36	—	90	150
			TH02B	M20× 1.5 (NPT 1/2)	Φ38	Φ28		140	200
								190	250
								240	300
								340	400
								440	500
							540	600	
			TH02C	M20× 1.5 (NPT 1/2)	Φ33.5	Φ13	—	95	150
			TH02D	M20× 1.5 (NPT 1/2)	Φ26.5	Φ13		145	200
								195	250
								245	300
								345	400
								445	500
							545	600	
			TH01T	M20× 1.5 (NPT 1/2)	M27× 2	Φ16	32	95	150
			TH01V	M20× 1.5 (NPT 1/2)	M27× 2	Φ12		145	200
								195	250
								245	300
								345	400
								445	500
							545	600	
						</			

外型及尺寸 Figure & Size			型号 Type	N	E	D	SW	U	L
			TH02G	M20×1.5 (NPT1/2)	Φ25	Φ21	—	150	230
			TH02H	M20×1.5 (NPT1/2)	Φ30	Φ25		200	280
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure						250	330
≤ 550	≤ 80	* ≤ 40						300	380
								350	430
								400	480
								450	530
								500	580
								550	630
			TH01V	M20×1.5 (NPT1/2)	M60×3	Φ28	66	230	260
			TH01W	M20×1.5 (NPT1/2)	NPT2	Φ28		430	460
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure						630	660
≤ 1100	0	≤ 9.8						1130	1160
			TH03J	M20×1.5 (NPT1/2)	Φ38	Φ21	—	50	150
			TH03K	M20×1.5 (NPT1/2)	Φ42	Φ18		100	200
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure						150	250
≤ 150	≤ 80	≤ 30							300
									350
			TH03K	M20×1.5 (NPT1/2)	Φ42	Φ18	—	50	100
								100	150
U(mm)	介质流速(m/s) Medium Flow Speed	公称压力(P600)MPa Nominal Pressure						150	200
≤ 300	≤ 30	≤ 6.4						200	250
								250	300
								300	350

保护管材质及选用

Tube Material & Selection

材质 Material	使用温度 Operation Temperature	特点及用途 Characters & Application
1Cr18Ni9Ti	-200~800	具有高温耐蚀性，通常作为一般耐热钢使用 Corrosion resistance under high temperature, usually used as general heat-resistant steel
304	-200~800	低碳含量，具有良好耐晶间腐蚀性，通常作为一般耐热钢使用 Low carbon content, strong corrosion resistance, usually as general heat-resistant steel
316	-200~750	低碳含量，具有良好耐晶间腐蚀性，作为耐蚀钢使用 Low carbon content, strong corrosion resistance, used as corrosion-resistant steel
316L	-200~750	超低碳含量，具有良好耐晶间腐蚀性，作为耐蚀钢使用 Extra low carbon content, strong corrosion resistance, used as corrosion-resistant steel
蒙乃尔 MonelK500	-100~700	镍铜合金，具有良好耐晶间腐蚀性，适用于强硫酸等耐蚀性场合使用 Ni-Cu alloy, strong corrosion resistance, for environment with corrosives
哈氏合金 H.Alloy-276	-100~700	具有优良耐晶间腐蚀性，作为耐蚀钢使用 Strong corrosion resistance, used as corrosion-resistant steel
Incone1600	-100~1000	镍铬铁合金，具有优良高温抗氧化性，通常作为耐热钢使用 Ni-Cr-Fe alloy, strong oxidization resistance under high temperature, usually used as heat-resistant steel
310S	-200~1000	具有高温抗氧化性，耐蚀型，通常作为耐热钢使用 Oxidization resistance under high temperature, corrosion resistance, usually used as heat-resistant steel
GH3030	0~1100	镍基高温合金钢，具有优良抗氧化性，耐蚀型，通常作为耐热钢使用 Nickel-base alloy steel resisting high temperature, strong oxidization resistance, corrosion resistance, usually used as heat-resistant steel
GH3039	0~1300	镍基高温合金钢，具有优良抗氧化性，耐蚀型，通常作为耐热钢使用 Nickel-base alloy steel resisting high temperature, strong oxidization resistance, corrosion resistance, usually used as heat-resistant steel
高铝质 High Al Content	0~1300	工业陶瓷管，具有优良抗氧化性，耐蚀型。 Industrial-purpose ceramic tube, strong oxidization resistance, corrosion resistance
刚玉质 Corundum	0~1600	工业陶瓷管，具有优良抗氧化性，耐蚀型。 Industrial-purpose ceramic tube, strong oxidization resistance, corrosion resistance
3YC52	0~1300	高温合金，具有优良抗氧化性，耐蚀型，机械性能好，适用于高温场所 alloy resistin high temperature, strong oxidization resistance, corrosion resistance, good mechanical performance, for environment with high temperature
二硅化钼 MoSi ₂	0~1600	具有优良抗氧化性，耐蚀型，机械性能好，适用于高温场所 Metallic ceramic, strong oxidization resistance, corrosion resistance, good mechanical performance, for environment with high temperature

选型须知

Notices in Type Selection

- 1) 型号
- 2) 套管代号
- 3) 插入深度
- 4) 套管材料

- 1) Type
- 2) Tube code
- 3) Insert length
- 4) Tube material

例：装配热电偶，活络管接头式，K型，套管代号 TH02AB 插入深度 150，套管材料 316.WRN-52TH02AB U=150

For example: assembly thermocouple, movable elbow-tube connection, Ktype, protection tube code TH02AB, insert length 150, protection tube material 316, described as: WRN-52TH02AB U=150