SMART WATER-PROOF

TEMPERATURE SENSOR

Thermocouple, RTD

Model No: MTS200

General Specifications

GS 19A16D01-01EN

TEMPERATURE SESNOR HEAD CONNECTION MTS200

Overview

MTS200 Armored type thermocouple RTD temperature sensor with water-proof, explosion-proof head, designed for industrial temperature measurement, working with kinds of instruments and meters, widely used in boiler, furnace, petroleum, metallurgy, chemicals, ceramic, mechanical, heating dealing and various process fields.

Armored Type Temperature Sensor MTS200

Feature

- **Advanced performance, high accuracy and stability**
- **Small element diameter, faster thermal response time**
- Element: T.C: K, T, J, S, E, N, R; RTD: PT100, CU50, CU100
- Built-in cold junction compensation for thermocouple input
- Measure range: -200 to 1600℃
- **Tube Diameter: single:2-8mm; double: 3-8mm**
- **Junction type: underground, ground, exposed**
- **Installation**: Thread, Flange
- **Head Type**: water-proof, splash-proof head

Specification

Accuracy	Class A, Class B; Class I, Class II	**Input Type**		**Temperature Range**	**Accuracy**
Element Type	K, T, J, S, E, N, R; PT100, CU50, CU100	**RTD**	**Pt100**	-200 to 500℃	Class A, B
Element number	Single, double		**CU50**	-50 to150℃	Class A , B
Element Diameter	Single: Φ2-8mm; Double: Φ3-8mm		**CU100**	-50 to150℃	Class A , B
Junction type	Underground, ground, exposed	**T.C.**	**B**	0 to 1600℃	Class I, II
Tube material	1Cr18Ni9Ti, GH3030; GH3090		**E**	0 to 800℃	Class I , II
Installation	Thread, flange		**J**	0 to 600℃	Class I , II
Thread size	M12x1.5, M8X1.5, M16X1.5; 1/2"NPT		**K**	-40 to 1200℃	Class I , II
Head material	Aluminum alloy with sliver-grey paint sprayed		**N**	-180 to 1200℃	Class I , II
Electrical connector	M20X1.5		**R**	0 to 1300℃	Class I , II
IP protection	IP65		**S**	0 to 1300℃	Class I , II
Working temperature	-40 to 85℃		**T**	-200 to 350℃	Class I , II

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■ Measuring Temperature Range &Accuracy

T.C. Type	Class I		Class II	
	Accuracy	Measuring Range	Accuracy	Measuring Range
K	±1.5℃	-40 to 375℃	±2.5℃	-40 to 333℃
	±0.004ltl	375 to1000℃	±0.0075ltl	333 to1200℃
N	±1.5℃	-40 to 375℃	±2.5℃	-40 to 333℃
	±0.004ltl	375 to1000℃	±0.0075ltl	333 to1200℃
E	±1.5℃	-40 to 375℃	±1.5℃	-40 to 333℃
	±0.004ltl	375 to 800℃	±0.004ltl	333 to 900℃
J	±1.5℃	-40 to 375℃	±1.5℃	-40 to 333℃
	±0.004ltl	375 to 750℃	±0.004ltl	333 to 750℃
T	±1.5℃	-40 to 125℃	±1℃	-40 to 133℃
	±0.004ltl	125to 350℃	±0.0075ltl	133 to 350℃
S	±1℃	0 to1100℃	±2.5℃	0 to 600℃
	± < (1+0.003(t-1100) >	1100 to1600℃	±0.0025ltl	600 to1600℃

RTD	Accuracy	Measuring Range	Allowed Error
PT100 PT1000	Class A	-200 to 500℃	±(0.15+,0.002ltl)
	Class B	-200 to 500℃	±(0.30+,0.005ltl)
		-200 to 500℃	±(0.60+,0.005ltl)
CU50		-50 to 150℃	±(0.30+,0.002ltl)
CU100		-50 to 150℃	±(0.30+,0.005ltl)

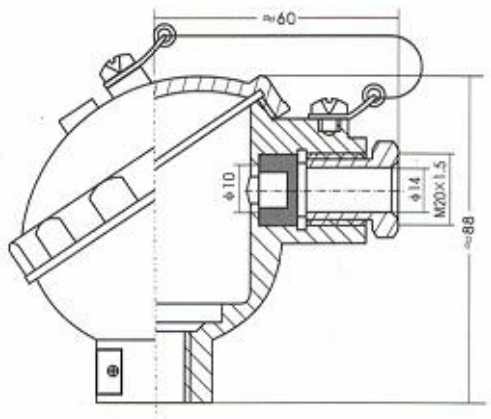
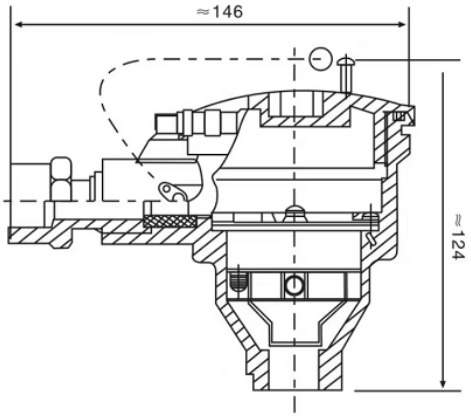
■ Element Diameter and Tube Material

Element Type	Tube Diameter	Tube Material		
Single	Φ2	K, E,J,T, PT100	K, N	S
	Φ3	ICr18Ni9Ti	GH3030 ICr18Ni9Ti	GH3039
	Φ4			
	Φ5			
	Φ6			
	Φ8			
Double	Φ3			
	Φ4			
	Φ5			
	Φ6			
	Φ8			

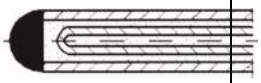
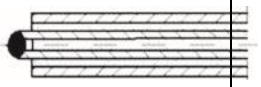
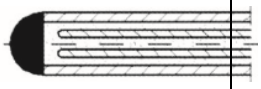
■ Suggested Working Temperature

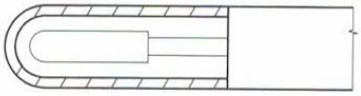
T.C. Type	Element Material	Tube material (SS)	Tube Diameter (Φ:mm)	Suggested Working Temperature(°C)	
				Long-time	Short-time
K	NiCr-NiSi	1Cr18Ni9Ti	Φ2	600	700
			Φ3	800	900
			Φ4,Φ5, Φ6	900	1000
			Φ8	1000	1100
		GH3030	Φ2, Φ3	800	900
			Φ4, Φ5	900	1000
			Φ6, Φ8	1000	1100
N	NiCrSi-NiSil	1Cr18Ni9Ti	Φ2	600	700
			Φ3	800	900
			Φ4,Φ5, Φ6	900	1000
			Φ8	1000	1100
		GH3030	Φ2, Φ3	900	1000
			Φ4, Φ5	1000	1100
			Φ6,Φ8	1100	1200
		GH3039	Φ2, Φ3, Φ4	1000	1100
			Φ5, Φ6,Φ8	1100	1200
E	NiCr-CuNi	1Cr18Ni9Ti	Φ2, Φ3	350	450
			Φ4,Φ5, Φ6,Φ8	450	550
J	Fe - CuNi	1Cr18Ni9Ti	Φ2, Φ3	300	400
			Φ4,Φ5, Φ6,Φ8	400	500
T	Cu-CuNi	1Cr18Ni9Ti	Φ2	150	200
			Φ3, Φ4, Φ5	200	250
			Φ6, Φ8	250	300
S	PtRh10-Pt	GH3039	Φ2, Φ3, Φ4	1000	1100
			Φ5, Φ6.0, Φ8	1100	1200

■ Head Size (mm)

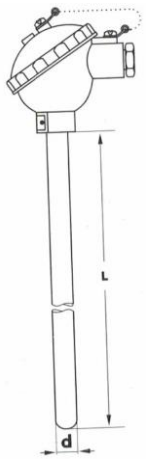
Standard Normal Head	Explosion-proof Head
	

■ Measurement Junction Type

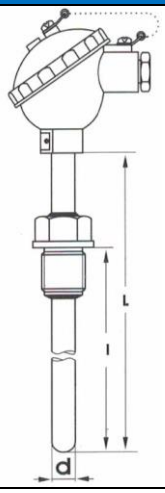
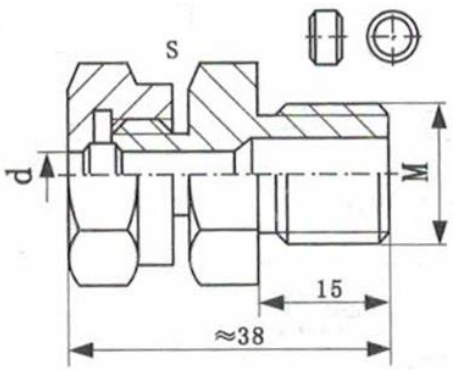
Thermocouple Junction	Picture	Tube Diameter (mm)		Feature
		Single element	Double Element	
Underground		Φ0.5 –Φ8		**fast response time, long life time, anti-electrometric interference**, suitable for application requiring fast response time but without special requirement but
Ground		Φ0.25-Φ8.0		**faster response time**, pressure resistance up to 3.4x102Mpa, not suitable for the application with electrometric interference
Exposed		Φ1 –Φ8	Φ3 –Φ8	**faster response time**, suitable for temperature measured requiring fast response time such as engineer exhaust
Isolated Underground			Φ3-Φ8	Same as underground type , meanwhile, can avoid the single interference between 2 elements

PT100 Element	Picture	PT100 Tube Diameter (mm)	Thermal Response Time t0.5S
Underground		Φ3	⩽3
		Φ4	⩽5
		Φ5	⩽8
		Φ6	⩽12
		Φ8	⩽15

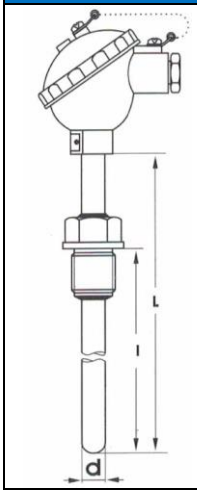
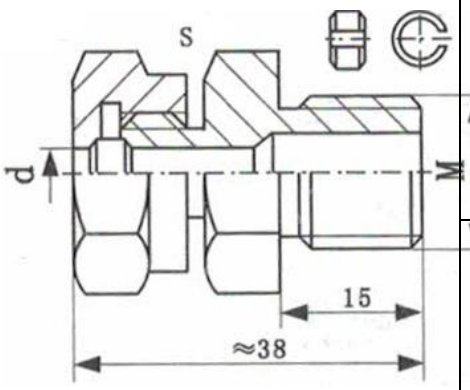
■ Installation：None

Picture	Type	Measuring Range	Protection Tube Material	Stem Length Lx IL
	S	0-1300°C	GH3039	300x150 350x200 400x250 450x300 500x400 650x500 900x750 1150x1000 1650x1500 2150x2000 Note: Tread or Flange connection with IL: stem insert length
	K	0-800°C	1Cr18Ni9Ti (SS321)	
		0-1100°C	GH3030	
	N	0-800°C	1Cr18Ni9Ti (SS321)	
		0-1100°C	GH3030	
	E	0-600°C	1Cr18Ni9Ti (SS321)	
	T	0-350°C		
	J	0-500°C		
	PT100	-200 to 500°C	1Cr18Ni9Ti (SS321)	
	CU50, CU100	-50 to 150°C		
	PT1000	-50~300℃	1Cr18Ni9Ti (SS321)	

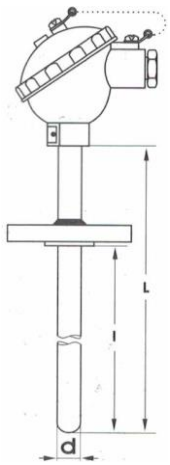
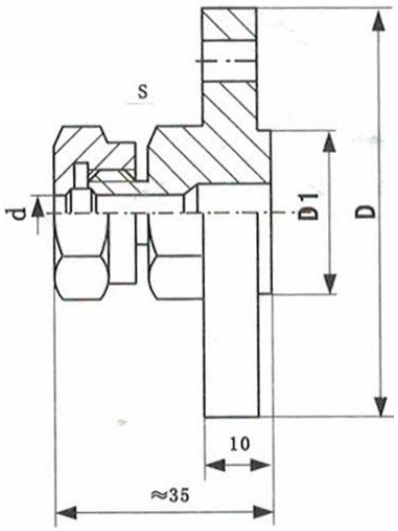
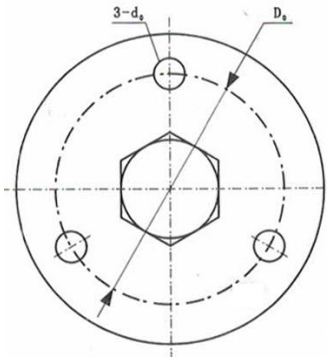
■ Installation：Fixed Thread

Picture	Fixed Thread	Code	Tube Diameter(D=mm)						Rated MPa
			Φ8	Φ6	Φ5	Φ4	Φ3	Φ2	
		**M**	M16 x1.5			M12X1.5			2.5Mpa
		S	22			19			

■ Installation：Flexible Thread

Type Picture	Flexible Thread	Code	Tube Diameter(D=mm)						Rated MPa
			Φ8	Φ6	Φ5	Φ4	Φ3	Φ2	
		M	M16 x1.5			M12X1.5			2.5Mpa
		S	22			19			

■ Installation：Flange

Flange	Fixed/Flexible Flange Size	Code	Tube Diameter(D=mm)						Rated: MPa
			Φ8	Φ6	Φ5	Φ4	Φ3	Φ2	
	 	D	Φ60			Φ50			2.5Mpa
		D0	Φ42			Φ36			
		D1	Φ24			Φ20			
		S	22			19			
		do	Φ9			Φ7			

■ Order Code

MTS200 Water-proof Armored Temperature sensor											
Order Code: E.g.: MTS200-K1S-T0P1D6EL100SA											Description
MTS200	-X	X	X	X	X	X	X	X	X	X	MTS200 Armored Temperature Sensor
Type	-K										K type thermocouple
	-E										E type thermocouple,
	-N										N type thermocouple
	-J										J type thermocouple
	-T										T type thermocouple
	-S										S type thermocouple
	-W										Wre526 or Wre523 thermocouple
	-P										PT100 RTD, range
	-C										CU50 RTD, range
	-P0										PT1000 RTD, range
Element		1									1
		2									2
Junction Type			S								underground
			G								Ground (thermocouple only)
			E								Exposed (thermocouple only)
Process Connection Type				-N							None
				-T0							Fixed thread
				-T1							Flexible thread
				-F0							Fixed flange
				-F1							Flexible flange
Process Connection Size					N						None
					P1						G1/2”, thread,
					P2						1/2”NPT, thread,
					P3						G1/4”, thread,
					P4						1/4”NPT, thread
					P5						M20X 1.5, thread,
					P6						M14x1.5, thread,
					P7						M27X2, thread
					P8						M16x1.5, thread,
					P9						M8X1.5
					P0						M12X1.5
					PX						Customized
Protection tube stem diameter(mm)						D2					Φ2 (thermocouple only)
						D3					Φ3
						D4					Φ4
						D5					Φ5
						D6					Φ6
						D8					Φ8
						D10					Φ10
						DX					customized

Stem Extended Length (mm)	N				None
	E150				Extended length including thread: 150mm
	E100				Extended length including thread: 100mm
	E50				Extended length including thread: 50mm
	EX				customized
Stem Insert Length including thread (mm)		LX			L100：L=100mm
Protection tube material			S		304SS
			M		316SS (
			S0		310SS
			G3		GH3030
			G9		GH3039
			C		Corundum tube
			IC		INCONEL600
			X		Others
Accuracy				A	Class A; Class I
				B	Class B; Class II
				2B	Class 2B; Class 2II

Note: Order Code: E.g.: MTS200-K1S-T0P1D6EL100SA, Φ6x100mm, extend length: 100mm, K type thermocouple, single element, underground, Class A, 304ss probe material, thread installation, thread size:1/2''G,