



Temperature Sensor

Datasheet

SUP-WZPK

SUP-WRNK

Screw-in temperature probe for standard applications

Brief description:

Screw-in temperature probes for standard applications are preferentially used for measuring temperatures in liquids and gases. A decisive selection criterion is the reliable sealing feature of this installation type with vacuum and with over-pressure. The application areas are, among others, in the air conditioning technology and refrigeration engineering as well as the HVAC and apparatus engineering sector.

Protection tubes made of various materials protect the measuring insert against chemical influences and mechanical damage. The appropriate protection tube material is selected according to the conditions on site.

Highlights:

- Temperature range from -50 to +250 °C
- With built-in measuring insert
- As TC or RTD temperature probes
- Available with transmitter

TC principle

A thermocouple is a closed loop circuit that consists of two dissimilar metal wires welded together at both ends. When a temperature difference exists between the two junctions, thermal electromotive force (EMF) is generated and an electric current flows in the closed circuit. The direction and magnitude of the EMF generated depend upon the temperature of the two junctions and upon the materials making up the thermocouple and are not affected by the size or length of the thermocouple wire. Temperature can be measured by knowing beforehand the change of EMF per degree change of temperature for a certain thermocouple.

RTD principle

Generally, electrical resistance of metal varies, depending on the temperature. Platinum in particular is more linear and has a larger temperature coefficient than most other metals. It is therefore, most suitable for temperature measurements. Platinum has excellent properties chemically and physically. Industrial high purity elements are readily obtained for long term use as a resistance elements for temperature measurements. The characteristics are specified in JIS and other foreign standards; thus, it permits a highly accurate temperature measurement.

Technical parameters:

Tolerance of RTD to temperature and applicable standard table

Standard Type	IEC 751		JIS C 1604	
	Class	Tolerance °C	Class	Tolerance °C
Pt100 (R(100°C)/R (0°C) =1.3851	A	$\pm(0.15+0.002 t)$	A	$\pm(0.15+0.002 t)$
	B	$\pm(0.3+0.005 t)$	B	$\pm(0.3+0.005 t)$

RTD operating temperature range

Symbol	Division	Operating temp range °C
L	For low temperature	-200-+100
M	For medium temperature	0-350
H	For high temperature	0-500

TC tolerance and applicable standard

	JIS C1605				IEC 584-2			ASTM E230		
	Temp Range	Class	Tolerances °C		Temp Range	Classes	Tolerances °C	Temp Range	Classes	Tolerances °C
SN SK	-40°C-+375°C	1	±1.5	NK	-40°C-+375°C	1	±1.5	+0°C- +1260°C	STD	±2.2°C- ±0.75%
	+375°C-+100°C		$\pm 0.004 t $		+375°C-+100°C		$\pm 0.004 t $			
	-40°C-+333°C	2	±2.5		-40°C-+333°C	2	±2.5		SP	±1.1°C- ±0.4%
	+333°C-+1200°C		$\pm 0.0075 t $		+333°C-+1200°C		$\pm 0.0075 t $			

	-167°C+40°C	3	±2.5		-167°C+40°C	3	±2.5	-200°C-0°C	ST D	±1.1°C-±2%
	-200°C--167°C		±0.015 t		-200°C--167°C		±0.015 t			

SE	-40°C+375°C	1	±1.5	E	-40°C+375°C	1	±1.5	+0°C-+870°C	ST D	±1.7°C-±0.5%		
	+375°C+800°C		±0.004 t		+375°C+800°C		±0.004 t					
	-40°C+333°C	2	±2.5		-40°C+333°C	2	±2.5		±0.0075 t	SP	±1°C-±0.4%	
	+333°C+900°C		±0.0075 t		+333°C+900°C		±0.0075 t					
	-167°C+40°C	3	±2.5		-167°C+40°C	3	±2.5		±0.015 t	-200°C-0°C	ST D	±1.7°C-±1%
	-200°C--167°C		±0.015 t		-200°C--167°C		±0.015 t					
SJ	-40°C+375°C	1	±1.5	J	-40°C+375°C	1	±1.5	+0°C-+760°C	ST D	±2.2°C-±0.75%		
	+375°C+750°C		±0.004 t		+375°C+750°C		±0.004 t					
	-40°C+333°C	2	±2.5		-40°C+333°C	2	±2.5		±0.0075 t	SP	±1.1°C-±0.4%	
	+333°C+750°C		±0.0075 t		+333°C+750°C		±0.0075 t					

ST	-40°C-+125°C	1	±0.5	T	-40°C-+125°C	1	±0.5	+0°C-+370°C	ST D	±1°C-0.75%
	+125°C-+350°C		±0.004 t		+125°C-+350°C		±0.004 t			
	-40°C-+133°C	2	±1.0		-40°C-+133°C	2	±1.0		SP	±5°C-0.4%
	+133°C-+350°C		±0.0075 t		+133°C-+350°C		±0.0075 t			
	-67°C-+40°C	3	±1.0		-67°C-+40°C	3	±1.0		ST D	±1°C-±1.5%
	-200°C--67°C		±0.015 t		-200°C--67°C		±0.015 t			

Components material of TC		
Symbol	Positive polarity	Negative polarity
N	Alloy consisting mainly of nickel, chromium and silicone	Alloy consisting mainly of nickel, and silicone
K	Alloy consisting mainly of nickel and chromium	Alloy consisting mainly of nickel and aluminum
E	Alloy consisting mainly of nickel and chromium	Alloy consisting mainly of nickel and copper
J	Iron	Alloy consisting mainly of nickel and copper
T	Copper	Alloy consisting mainly of nickel and copper

Operating temperature range (in air)					
Sheath OD(mm)	N	K	E	J	T
0.25	-	500* ¹	-	-	-
0.5	-	600* ¹	-	-	-

1.0	900*3	650		900*3	650	450	300
2.0	1200*3	650		1200*3	650	450	300
3.0	1260*3	750		1260*3	750	650	350
5.0	1260*3	800		1260*3	800	750	350
6.0	1260*3	1000*1	900*2	1260*3	800	750	350
8.0	-	1050*1	1000*2	-	800	750	350



Screw-in RTD PT100

Screw-in TC K/S/E/J/T/R/B/N

Measuring range:

Cold junction length **L1**: 100mm (default value)

Sensor diameter **R**: 6mm (default value)

Tread type **M**: M20*1.5, or customized

Fitting length **L2**: 30mm (default value)

Output: 4-20mA, 1-5V (with transmitter)

Special requirements: transmit, water-proof, anti-corrosion

Thread Type **M**: M20*1.5 or customized

Installation: flange, clamp, direct insertion,

Screw base

Order Code

Basic type

A SUP-WZPK RTD

B SUP-WRNK TC

Operating temperature in ° C

C -50~250°C

D Other

Fitting length

E 50mm

F 100mm (standard)

G 200mm

H 500mm

Tolerance class according

I Class A(standard)

J Class B

Process connection

K M20*1.5 (standard)

L G1/4

M G1/2

N Other

Sensor diameter

O 4mm

P 6mm

Q 8mm

R 10mm

Temperature transmitter

S With temperature transmitter

(4-20ma output)

T Without temperature transmitter

Order code:

Order example: A C F I K P R