

Temperature Sensor WZPK WRNK series Datasheet



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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.

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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 $				

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	-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					

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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		-200°C-0°C	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	-	-	-

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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

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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

Temperature Sensor WZPK WRNK series



Ordering code

WZPK-PA-00-L2-06-1H-M1-50-WF									Description
WZPK	-	-	-	-	-	-	-	-	-
Graduation	PA								Pt100, A Class
Mark	XX								Other
Transmitter Output and Power Supply		00							None
		A1							2-wire 4-20mA
		XX							Other
Thread Type			L2						M20×1.5
			L3						M27×2
			G1						G1/2
			L1						M14×1.5
			G2						G1/4
			NC						NPT1/2
			00						None
			XX						Other
	Probe (Sheath) Diameter				06				
				1E					Φ8mm Core-pulled
				2E					Φ10mm Core-pulled
				3E					Φ12mm Core-pulled
				4E					Φ16mm Core-pulled
				5E					Φ8mm Detachable Sheath
				6E					Φ12mm Detachable Sheath
				7E					Φ16mm Detachable Sheath
				04					Φ4mm
				XX					Other
Probe (Sheath) Length					1H				100mm
					H				200mm

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	H			300mm
	H			500mm
	1T			1000mm
	20			20mm
	30			30mm
	50			50mm
	XX			Other
Material	M1			304SS
	XX			Other
Cold Junction Length		50		50mm
		00		0mm
		XX		Other
Junction Box			WF	M20×1.5 Cable Gland, Aluminum Alloy, IP65
			XX	Other

WRNK-B-K1-00-L2-06-1H-M1-50-WF									Description
WRNK-B	-	-	-	-	-	-	-	-	-
Graduation Mark	K1								K-type Thermocouple, I Class
	S1								S-type Thermocouple, II Class
	K2								K-type Thermocouple Dual Support, I Class
	J1								J-type Thermocouple, I Class
	T1								T-type Thermocouple, I Class
	E1								E-type Thermocouple, I Class
	S2								S-type Thermocouple Dual Support, II Class
	B1								B-type Thermocouple, II Class
B2								B-type Thermocouple Dual Support, II Class	

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XX					Other
Transmitter Output and Power Supply	00				None
	A1				Two-wire 4-20mA
	A2				Two-wire 4-20mA+HART
	V3				1-5V, 24VDC
	XX				Other
Thread Type	L2				M20×1.5
	L3				M27×2
	G1				G1/2
	G4				G3/4
	L1				M14×1.5
	G2				G1/4
	NC				NPT1/2
	NE				NPT3/4
	NA				NPT1/4
	K2				M20×1.5 Collar
	K3				M27×2 Collar
	KB				G1/2 Collar
	KC				G3/4 Collar
	K1				M16×1.5 Collar
	KA				G1/4 Collar
	FA				HG/T20592 PN25/40 DN25
	FB				HG/T20592 PN25/40 DN40
	FC				HG/T20592 PN25/40 DN50
	HA				HG/T20592 PN25/40 DN25 Active
	HB				HG/T20592 PN25/40 DN40 Active
HC				HG/T20592 PN25/40 DN50 Active	
AK				2" Clamp	
00				None	
XX				Other	
Probe (Sheath) Diameter		06			Φ6mm
		08			Φ8mm
		2E			Φ10mm Core-pulled

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	3E				Φ12mm Core-pulled
	4E				Φ16mm Core-pulled
	5E				Φ8mm Detachable Sheath
	6E				Φ12mm Detachable Sheath
	7E				Φ16mm Detachable Sheath
	04				Φ4mm
	XX				Other
Probe (Sheath) Length		1H			100mm
		2H			200mm
		3H			300mm
		5H			500mm
		1T			1000mm
		20			20mm
		30			30mm
		50			50mm
	XX				Other
Material		M1			304SS
		M3			SS316L
		N6			Polytetrafluoroethylene
		M5			2520SS
		M6			3030SS
		NH			Corundum
		XX			Other
Cold Junction Length			50		50mm
			1H		100mm
			00		0mm
			XX		Other
Junction Box				WF	M20×1.5 Cable Gland, Aluminum Alloy, IP65
				XX	Other