

# Thermocouple Converter

WSP-THS



This compact plug-in converter accepts Thermocouples signal input conforming to JIS standard and provides optically isolated DC voltage or current output. This converter has a linearizer, a cold junction compensation circuit, and a burnout protection circuit as standard equipment which is required to measure temperature.

## Features

- ★ Fine Zero & span adjustment by 15 turn trimmer
- ★ Zero & span adjustment  $\pm 10\%$  full scale
- ★ Safe design by dielectric strength of 3000Vac
- ★ 5 years warranty, long life
- ★ CE approved
- ★ Linearizer, Cold junction compensation circuit, and Burnout protection circuit built-in

## Ordering code

WSP- **THS** -    -

Code	Input Signal
T	T (CC) thermocouple
E	E (CRC) thermocouple
J	J (IC) thermocouple
K	K (CA) thermocouple
N	N thermocouple
R	R (PR13) thermocouple
S	S thermocouple
B	B thermocouple
W	WRe 5-26

Measuring Temperature Range	Code	Manufacturable Range by Thermocouple									
		T	E	J	K	N	R	S	B	W	
0 to 100°C	08	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 150°C	09	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 200°C	10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 250°C	11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 300°C	12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 400°C	13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 500°C	14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 600°C	15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 800°C	16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 1000°C	17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 1200°C	18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 1300°C	19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 1400°C	20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 1600°C	21	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 1800°C	22	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 2000°C	23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
0 to 2300°C	24	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other than above	99 * 1	Contact us									

Code	Test Report
X	None
T	With Test report

Code	Power Supply
A	100 to 240Vac $\pm 10\%$ 50/60Hz
D	24Vdc $\pm 10\%$
* 2	10.8 to 30Vdc
8	110Vdc $\pm 10\%$

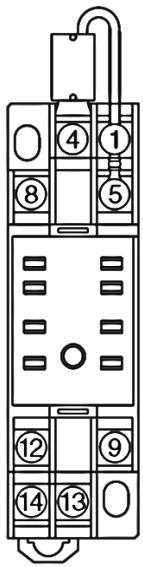
Code	Output	Allowable Load Resistance
A	4 to 20mA dc	750Ω or less
B	1 to 5mA dc	3kΩ or less
D	0 to 1mA dc	15kΩ or less
E	0 to 10mA dc	1.5kΩ or less
G	0 to 20mA dc	750Ω or less
H	1 to 5Vdc	1kΩ or more
J	0 to 10mVdc	10kΩ or more
K	0 to 100mVdc	100kΩ or more
L	0 to 1Vdc	200Ω or more
N	0 to 5Vdc	1kΩ or more
P	0 to 10Vdc	2kΩ or more
S * 1	Contact us for other than the above Current output 20mA or less Voltage output 10V or less	

- \* 1...CE approval do not adapt input range code 99 and output range code S.  
\* 2...CE approval do not adapt when power supply is 10.8Vdc to 30Vdc.

## Specifications

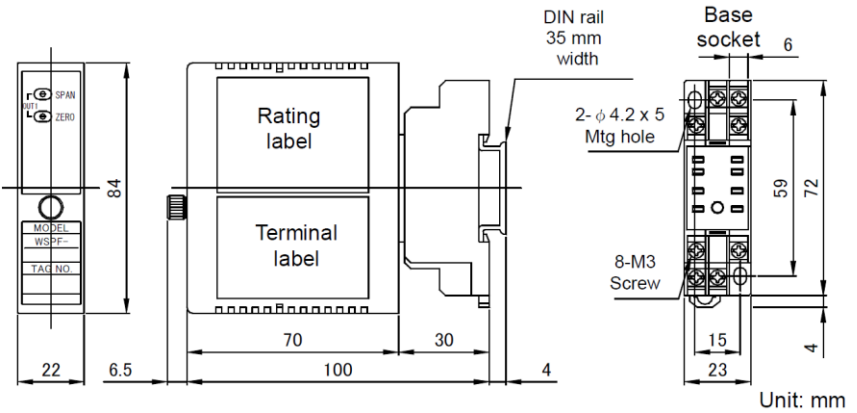
Accuracy	$\pm 0.2\%$ FS (at $23 \pm 10^\circ\text{C}$ )
Response time	Approx. 25ms (0 to 90%)
Allowable load	Current output 15V or less of voltage drop Voltage output Load current 5mA or less *1μA or less if the output is less than 1V FS
Zero & span adjustment	$\pm 10\%$ FS (15 turn trimmer)
Operating temperature	-5 to +55°C
Operating relative humidity	90% or less (Non-condensing)
Temperature coefficient	$\pm 0.015\%$ FS of span per °C
Cold junction compensation	$\pm 0.5^\circ\text{C}$ or less at $23 \pm 10^\circ\text{C}$ ( $\pm 1^\circ\text{C}$ or less for R, WR and S)
Accuracy	
Cold junction compensation	10 to 40°C
Temperature	*R, S, WR thermocouple : $\pm 1^\circ\text{C}$
Linearization	Available (30% FS or less of R and W is out of range)
Burnout protection	Upscale / downscale *Please specify when you order for downscale
Isolation	Between input, output, and power supply
Insulation resistance	100MΩ or more with 500Vdc megger Between input, output, and power supply terminal
Dielectric strength	3000Vac for 1 min between power supply and input/output terminal, 2000Vac for 1 min between input and output terminal
Power consumption	Approx. 4.4VA (AC), Approx. 63mA (DC)
Power supply variation	$\pm 0.1\%$ FS (within the range of rated voltage)
Dimensions	84(H) X 23(W) X 106.5(D)mm
Weight	Approx. 130g
Structure	Plug-in (Body part and socket part)
Connection	M3 SEMS screw part of the base socket (Tightening torque 0.6N·m)
Mounting	DIN rail or wall surface
Case color and material	Ivory, ABS resin, flame retardant grade UL94V-0
EMC directive	EN61326-1, EN61010-1, EN IEC 63000 Installation category : II, Pollution degree : 2
Rated altitude	2000m or less

## Terminal connections



No	Symbol	Description
1	INPUT	+
4		-
5	CJC	Cold junction compensation
8	NC	No connection
9	OUTPUT-1	+
12		-
13	POWER	U(+)
14		V(-)

## Dimensions



\* Specification is subject to change without notice

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<http://www.watanabe-electric.co.jp/en/>