

# Bar Graph Temperature Controllers



## KPN Series CATALOG

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

The specifications, dimensions, etc are subject to change without notice for product improvement. Some models may be discontinued without notice.

### Features

- High speed sampling of 50ms and  $\pm 0.3\%$  display accuracy
- Enable to check control output operation amount by adopting bar graph
- Simultaneous heating/cooling control and automatic/manual control for high performance control
- Selection function of current output or SSR drive output
- Parameter setting available via PC (USB and RS485 communication)  
- Free device comprehensive management program (DAQMaster)
- Communication converter sold separately:  
SCM-US (USB/Serial converter), SCM-381 (RS232C/RS485 converter) SCM-US481 (USB/RS485 converter)
- Multi-SV (Max. 4) function (select via digital input terminal)
- Heater break alarm
- CT sold separately: CSTC-E80LN, CSTC-E200LN, CSTS-E80PP
- Small size (rear length: 60 mm)
- Multi input/multi range



### Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website.

**K P N 5 ① ② - ③ ④ 0**

#### ① Size

- 2: DIN W 96 × H 48 mm
- 3: DIN W 48 × H 96 mm
- 5: DIN W 96 × H 96 mm

#### ③ Option Communication output

- 0: No
- 2: RS485

#### ② Control output

PN	Output number	Type	
		Heating: OUT1	Cooling: OUT2
00	1 (Heating or Cooling)	Relay, selectable current or SSR drive output	
11	2 (Heating & Cooling)	Selectable current or SSR drive output	
13		Selectable current or SSR drive output	Relay
17		Relay	Selectable current or SSR drive output
19		Relay	

#### ④ Option in/output

- 0: No
- 3: Transmission output + Remote SV

### Software

Download the installation file and the manuals from the Autonics website.

#### ■ DAQMaster

DAQMaster is comprehensive device management program. It is available for parameter setting, monitoring.

### Specifications

Series	KPN Series	
Power supply	100 - 240 VAC ~ 50/60 Hz	
Power consumption	≤ 15 VA	
Sampling period	50 ms	
Input specification	Refer to 'Input Type and Using Range'.	
Option input	CT input	• 0.0-50.0 A (primary current measurement range) • CT ratio: 1/1,000
	Remote SV	1 - 5 VDC = or 4 - 20 mA (Current Input: External resistance 250 Ω)
	Digital input	• Contact - ON: ≤ 2 kΩ, OFF: ≥ 90 kΩ • Non contact - residual voltage ≤ 1.0 V, leakage current ≤ 0.1 mA
Control output	Relay	250 VAC ~ 5 A 1a
	SSR	11 VDC = ± 2 V, ≤ 20 mA
	Current	DC 4-20 mA or DC 0-20 mA (parameter), load resistance: ≤ 500 Ω
Alarm output	Relay	250 VAC ~ 3 A 1a
Option output	Transmission	DC 4 - 20 mA (load resistance: ≤ 500 Ω, output accuracy: ± 0.3% F.S. ± 1-digit)
	RS485 Comm.	Modbus RTU
Display type	7 segment (red, green), control output bar graph (red, green), LED type	
Control type	Heating, Cooling	ON/OFF, P, PI, PD, PID Control
	Heating & Cooling	
Hysteresis	• Thermocouple, RTD: 1 to 100 (0.1 to 100.0) °C/°F • Analog: 1 to 100 digit	
Proportional band (P)	0.1 to 999.9 °C/°F (0.1 to 999.9%)	
Integral time (I)	0 to 9,999 sec	
Derivative time (D)	0 to 9,999 sec	
Control cycle (T)	• 0.1 to 120.0 sec [relay output model] • 1.0 to 120.0 sec [SSR drive output model]	
Manual reset	0.0 to 100.0%	
Relay life cycle	Mechanical	≥ 10,000,000 operations
	Electrical	≥ 100,000 operations (load resistance: 250 VAC ~ 3 A)
Dielectric strength	Between power source terminal and input terminal: 2,000 VAC ~ 50/60 Hz for 1 min	
Vibration	0.75 mm amplitude at frequency of 5 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours	
Insulation resistance	≥ 100 MΩ (500 VDC = megger)	
Noise immunity	± 2 kV square shaped noise (pulse width 1 μs) by noise simulator R-phase, S-phase	
Memory retention	≈ 10 years (non-volatile semiconductor memory type)	
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (no freezing or condensation)	
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)	
Protection structure	IP65 (front panel, IEC standards)	
Insulation type	Double or reinforced insulation (mark: □, dielectric strength between the measuring input part and the power part: 2 kV)	
Accessory	Bracket	
Approval	CE ENEC	
Unit weight (packaged)	• KPN52□-□: ≈ 160 g (≈ 230 g)	• KPN53□-□: ≈ 160 g (≈ 230 g)
	• KPN55□-□: ≈ 220 g (≈ 316 g)	

## Communication Interface

### ■ RS485

<b>Comm. protocol</b>	Modbus RTU
<b>Application standard</b>	EIA RS485 compliance with
<b>Maximum connection</b>	31 units (Address: 01 to 127)
<b>Synchronous method</b>	Asynchronous
<b>Comm. method</b>	Two-wire half duplex
<b>Comm. effective range</b>	≤ 800 m
<b>Comm. speed</b>	2,400 / 4,800 / 9,600 (default) / 19,200 / 38,400 bps (parameter)
<b>Response time</b>	5 to 99 ms (default: 20 ms)
<b>Start bit</b>	1 bit (fixed)
<b>Data bit</b>	8 bit (fixed)
<b>Parity bit</b>	None (default), Odd, Even
<b>Stop bit</b>	1 bit, 2 bit (default)

## Input Type and Using Range

The setting range of some parameters is limited when using the decimal point display.

Input type	Decimal point	Display	Using range (°C)	Using range (°F)
Thermo-couple	K (CA)	1	-200 to 1,350	-328 to 2,463
	J (IC)	1	-200 to 800	-328 to 1,472
	E (CR)	1	-200 to 800	-328 to 1,472
	T (CC)	1	-200 to 400	-328 to 752
	B (PR)	1	0 to 1,800	32 to 3,272
	R (PR)	1	0 to 1,750	32 to 3,182
	S (PR)	1	0 to 1,750	32 to 3,182
	N (NN)	1	-200 to 1,300	-328 to 2,372
	C (TT) <sup>01)</sup>	1	0 to 2,300	32 to 4,172
	G (TT) <sup>02)</sup>	1	0 to 2,300	32 to 4,172
	L (IC)	1	-200 to 900	-328 to 1,652
	U (CC)	1	-200 to 400	-328 to 752
	Platinel II	1	0 to 1,390	32 to 2,534
	Cu50 Ω	0.1	-199.9 to 200.0	-199.9 to 392.0
Cu100 Ω	0.1	-199.9 to 200.0	-199.9 to 392.0	
RTD	JPt100 Ω	1	-200 to 650	-328 to 1,202
	DPT50 Ω	0.1	-199.9 to 600.0	-199.9 to 999.9
	DPT100 Ω	1	-200 to 650	-328 to 1,202
	Nickel120 Ω	1	-80 to 200	-112 to 392
Analog	0 to 10V	-	-1,999 to 9,999	-112 to 392
	0 to 5V	-	(Display range varies according to the position of the decimal point.)	
	1 to 5V	-		
	0 to 100 mV	-		
	0 to 20 mA	-		

01) C (TT): Same as existing W5 (TT) type sensor

02) G (TT): Same as existing W (TT) type sensor

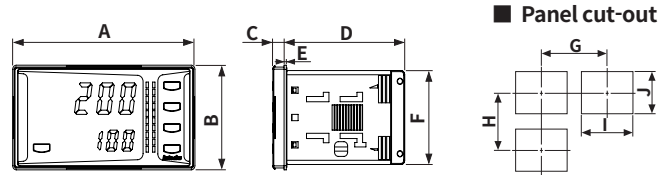
• Permissible line resistance per line: ≤ 5 Ω

### ■ Display accuracy

Input type	Using temperature	Display accuracy
Thermo-couple RTD	At room temperature (23°C ± 5°C)	(PV ± 0.3% or ± 1°C higher one) ± 1-digit • Thermocouple K, J, T, N, E below -100°C and L, U, PLI, RTD Cu50 Ω, DPT50 Ω: (PV ± 0.3% or ± 2°C higher one) ± 1-digit • Thermocouple C, G and R, S below 200°C: (PV ± 0.3% or ± 3°C higher one) ± 1-digit • Thermocouple B below 400°C: There is no accuracy standards
	Out of room temperature range	(PV ± 0.5% or ± 2°C higher one) ± 1-digit • RTD Cu50 Ω, DPT50 Ω: (PV ± 0.5% or ± 3°C higher one) ± 1-digit • Thermocouple R, S, B, C, G: (PV ± 0.5% or ± 10°C higher one) ± 1-digit • Other sensors: ≤ ± 5°C (≤ -100°C)
Analog	At room temperature (23°C ± 5°C)	± 0.3% F.S. ± 1-digit
	Out of room temperature range	± 0.5% F.S. ± 1-digit

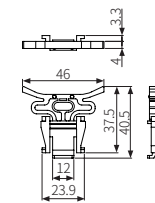
## Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.
- Below is based on KPN52□-□ Series.

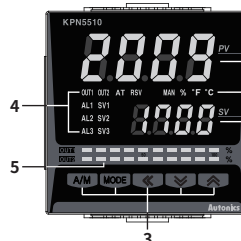


	Body						Panel cut-out			
	A	B	C	D	E	F	G	H	I	J
KPN52□-□	96	48	6	64.5	1.5	44.7	≥ 115	≥ 65	92 <sup>+0.8</sup> <sub>0</sub>	45 <sup>+0.6</sup> <sub>0</sub>
KPN53□-□	48	96	6	64.5	1.5	91.5	≥ 65	≥ 115	45 <sup>+0.6</sup> <sub>0</sub>	92 <sup>+0.8</sup> <sub>0</sub>
KPN55□-□	96	96	6	64.5	1.5	91.5	≥ 115	≥ 115	92 <sup>+0.8</sup> <sub>0</sub>	92 <sup>+0.8</sup> <sub>0</sub>

### ■ Bracket



## Unit Descriptions



### 1. PV display part (Red)

- Run mode: Displays PV (Present value).
- Setting mode: Displays parameter name.

### 2. SV display part (Green)

- Run mode: Displays SV (Setting value).
- Setting mode: Displays parameter setting value.

### 3. Input key

Display	Name
[A/M]	Control Switching key
[MODE]	Mode key
[←], [→], [▲]	Setting value control key

### 4. Indicator

Display	Name	Description
MAN	Manual control	Turns ON during manual control
%, °F, °C	Unit	Displays selected unit (parameter)
OUT1/2	Control output	Turns ON when the control output is ON • Current output Manual control: 0% OFF, over ON Auto control: below 2% OFF, over 3% ON
AT	Auto tuning	Flashes during auto tuning every 1 sec
RSV	Remote SV	Turns ON during remote SV control
AL1/2/3	Alarm output	Turns ON when the alarm output is ON
SV1/2/3	Multi SV	The SV indicator is ON which is currently displayed. (When using multi SV function)

### 5. Bar graph: Refer to 'Bar Graph'.

### 6. PC loader port: For connecting communication converter (sold separately).

## Sold Separately

- Terminal protection cover: RHA / RLA Cover
- Current transformer (CT)
- Communication converter: SCM Series