

# Panasonic

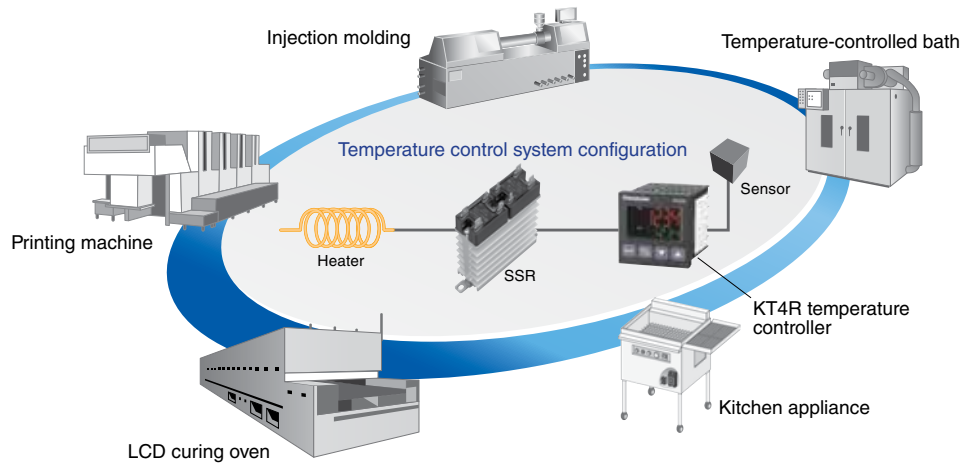
## TEMPERATURE CONTROLLER

### KT□R series

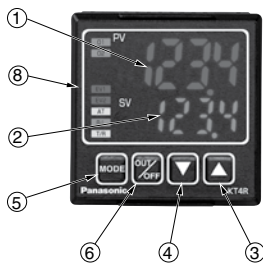


## Special features

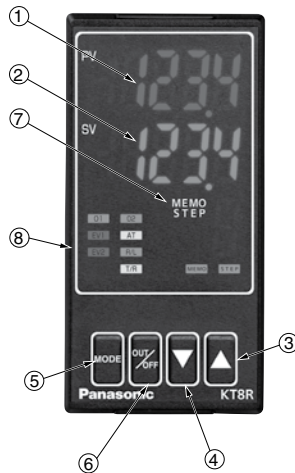
- Fast & easy configuration
- Built-in easy programming function
- Fine control of heat capacity
- Built-in rearing auto-tuning function
- Large display and keys
- Compact design
- Usable as a signal converter thanks to DC current output



### KT4R series



### KT8R series



### KT9R series



- |   |  |  |
|---|--|--|
| 1 | PV display:  | Indicates PV (process value).  |
| 2 | SV display:  | Indicates SV (setting value).  |
| 3 | Increase key:  | Increases numerical value.   |
| 4 | Decrease key:  | Decreases numerical value.   |
| 5 | Mode key:  | Switches the setting mode.   |
| 6 | OUT/OFF key:   | Control output is turned on or off when control output is ON.  |
| 7 | STEP / MEMO display  | Indicates the set value memory number (backlight: green).  |
| 8 | Action indicators (backlight: orange. The colors are the same for all models.) |  |
|   | T/R  | Lights during serial communication (option) TX output.   |
|   | AT   | Flashes during auto-tuning or auto-reset.  |
|   | O1   | Lights when control output is ON or Heating output (option) is ON. For DC current output type, it flashes corresponding to the manipulated variable in 0.25 second cycles. |
|   | O2   | Lights when cooling output (option) is ON.   |
|   | EV1  | Lights when alarm 1 output is ON.  |
|   | EV2  | Lights when alarm 2 output (option) is ON or heater burn-out alarm (option) is ON.   |

## KT4R series

Base model	Power supply	Sensor input	Control output	Alarm output	Heating/cooling control	Heater burnout alarm	Communication function	Model No.	
AKT4R	1 (100 to 240V AC)	1 (Multi-input)	1 (Relay contact)	1 (1 point)	0 (Not available)	0 (Not available)	Blank (Not available)	AKT4R111100	
				2 (2 points)			1 (serial communication RS485)	AKT4R1111001	
				2 (Non-contact voltage)			1 (1 point)	Blank (Not available)	AKT4R111200
							2 (2 points)	1 (serial communication RS485)	AKT4R1112001
			2 (Non-contact voltage)	1 (1 point)			Blank (Not available)	AKT4R112100	
				2 (2 points)			1 (serial communication RS485)	AKT4R1121001	
				Blank (Not available)			AKT4R112200		
				1 (serial communication RS485)			AKT4R1122001		

## KT8R series

Base model	Power supply	Sensor input	Control output	Alarm output	Heating/cooling control	Heater burnout alarm	Model No.
AKT8R	1 (100 to 240V AC)	1 (Multi-input)	1 (Relay contact)	1 (1 point)	0 (Not available)	0 (Not available)	AKT8R111100
				2 (2 points, see note)			AKT8R111200
			2 (Non-contact voltage)	1 (1 point)			AKT8R112100
				2 (2 points)			AKT8R112200

Note: EV2 can be activated for heating and cooling control.

## KT9R series

Base model	Power supply	Sensor input	Control output	Alarm output	Heating/cooling control	Heater burnout alarm	Model No.
AKT9R	1 (100 to 240V AC)	1 (Multi-input)	1 (Relay contact)	1 (1 point)	0 (Not available)	0 (Not available)	AKT9R111100
			3 (DC current output)	1 (1 point)			AKT9R113100

## Options

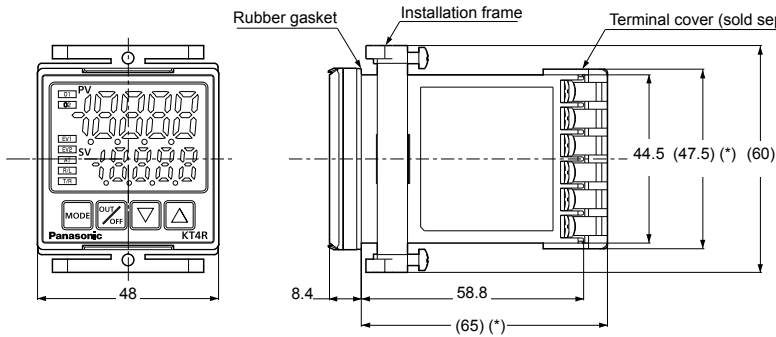
Product	Applicable for	Model No.
Terminal cover	KT4R	AKT4H801
	KT8R	AKT8R801
	KT9R	AKT9R801
Installation frame	KT4R	AKW4822
	KT8R	AKW8822
	KT9R	—
Current transformer	5A, 10A, 20A	C1
	50A	C2

Note: Since a shunt resistor is built in, a separately sold shunt resistor is not required when DC current input is specified.

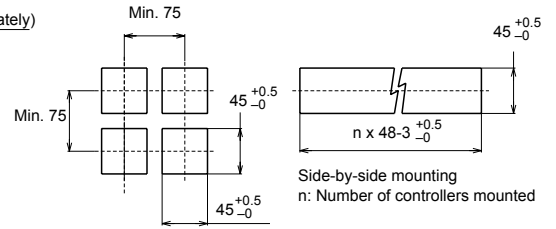
# Dimensions

## KT4R series (unit: mm)

### External dimensions

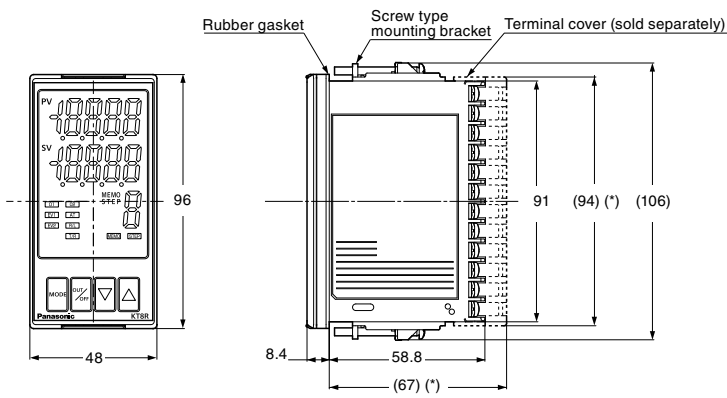


### Panel cutout (thickness: 1 to 5mm)

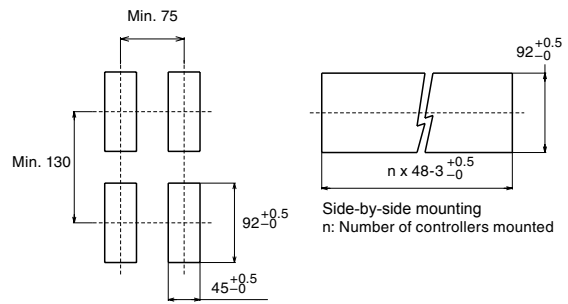


## KT8R series (unit: mm)

### External dimensions

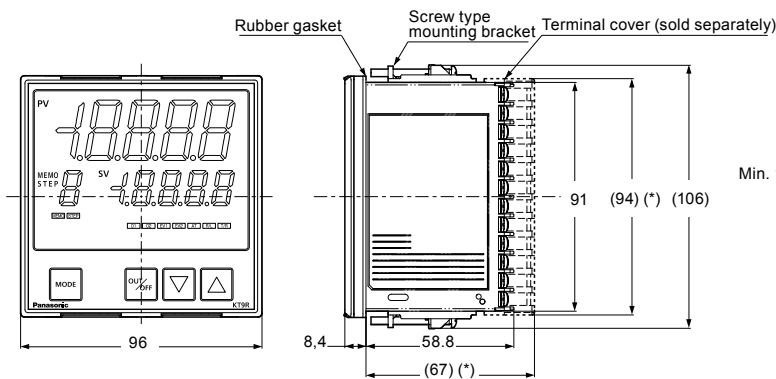


### Panel cutout (thickness: 1 to 7mm)

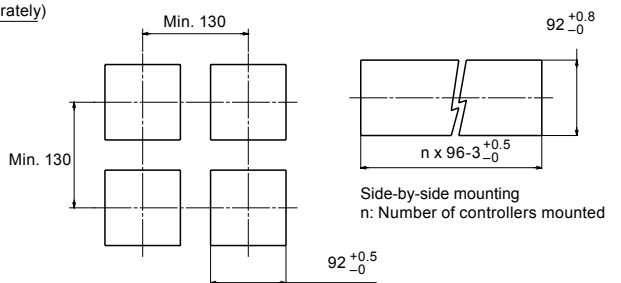


## KT9R series (unit: mm)

### External dimensions

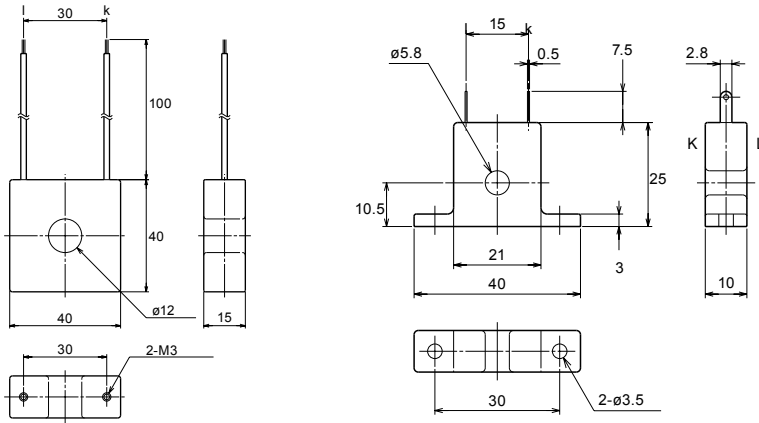


### Panel cutout (thickness: 1 to 7mm)



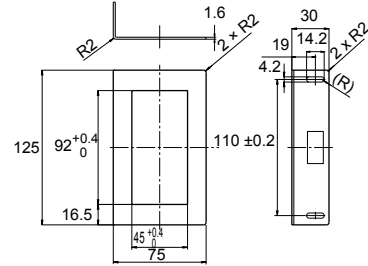
## Current transformers

- CT1 (for 5, 10 and 20A)
- CT2 (for 50A)

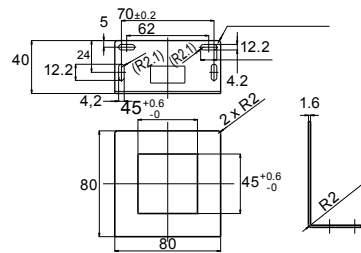


## Installation frames

- AKW4822 (for KT4R)

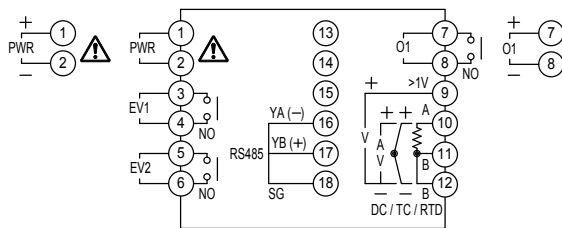


- AKW8822 (for KT8R)



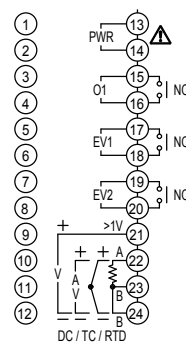
## Connection with external devices

### KT4R series



<b>POWER SUPPLY:</b>	Power supply voltage 100 to 240VAC or 24VAC / DC (make sure the polarity is correct when using DC in AC / DC 24V)
<b>EV1</b>	Event output 1
<b>EV2</b>	Event output 2 (option)
<b>O1</b>	Control output OUT1
<b>TC</b>	Thermocouple input
<b>RTD</b>	Resistance temperature detector input
<b>DC</b>	DC voltage input or DC current input
<b>RS485</b>	Serial communication RS485 (option: C5W)

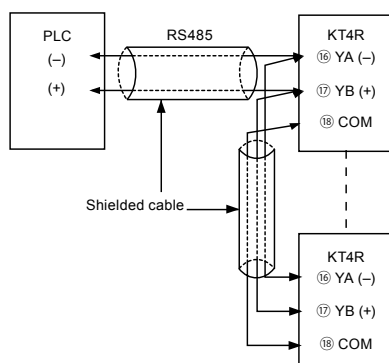
### KT8R / KT9R series



<b>POWER SUPPLY:</b>	Power supply voltage 100 to 240VAC
<b>EV1</b>	Event output 1
<b>EV2</b>	Event output 2 (option)
<b>O1</b>	Control output OUT1
<b>TC</b>	Thermocouple input
<b>RTD</b>	Resistance temperature detector input
<b>DC</b>	DC voltage input or DC current input

## Connection with a PLC for RS485 communication

### KT4R series



#### Notes:

1. Terminating resistors (terminators)  
The KT series has a built-in pull-up resistor or pull-down resistor, which serves as the terminating resistor. For this reason, do not connect the terminating resistor with the communication line.
2. Please use a polarized RJ-11 type 6 modular connector.

# Specifications

Model		KT4R	KT8R	KT9R			
Dimensions (WxH)		48 x 48mm	48 x 96mm	96 x 96mm			
Rating (rating scaled depending on input type)	Supply voltage (must be specified)		100 to 240V AC	100 to 240V AC			
			24V AC / DC	—			
	Frequency		50 / 60Hz				
	Power consumption		8VA approx.				
	Thermo-couple	K	-200 to 1370°C				
			-200.0 to 400.0°C				
			J	-200 to 1000°C			
				0 to 1760°C			
			R	0 to 1760°C			
				0 to 1820°C			
			E	-200 to 800°C			
				-200.0 to 400.0°C			
			N	-200 to 1300°C			
	0 to 2315°C						
	RTD	Pt100	-200 to 850°C				
-200.0 to 850.0°C							
JPt100		-200 to 500°C					
DC current	4 to 20mADC	Scaling and change to the decimal point position is possible for DC current input and DC voltage input.					
	0 to 20mADC						
DC voltage	0 to 1VDC						
	0 to 10VDC						
	1 to 5VDC						
	0 to 5VDC						
Thermocouple					K, J, R, S, B, E, T, N, PL-II, C (W / Re5-26) External resistor: Max. 100Ω (max. 40Ω external resistor for B input)		
RTD					Pt100, JPt100 3-conductor system (allowable input conductor resistance for each conductor: max. 10Ω)		
DC current	0 to 20mADC				Input impedance: 50Ω Allowable input current: Max. 50mA		
	4 to 20mADC						
DC voltage	0 to 1VDC	Input impedance: Min. 1 MΩ, allowable input voltage: max 5V, allowable signal source resistance: Max. 2 kΩ  Input impedance: Min. 100 kΩ, Allowable input voltage: Max 15V, allowable signal source resistance: Max. 100Ω					
	0 to 5VDC						
	1 to 5VDC						
	0 to 10VDC						
Control output (must be specified)	1a Relay contact	3A 250V AC (at resistive load), 1A 250V AC (at inductive load $\cos \phi = 0.4$ ), electrical life: 100000 times					
	Non-contact voltage (voltage output for SSR drive)	12 <sup>+2</sup> <sub>0</sub> VDC, Max. load current: 40mA (with short-circuit protection circuit)					
	DC current	4 to 20mADC, load resistance: Max. 550Ω					
Alarm output 1 (EV1) Alarm output 2 (EV2)	Relay contact 1a 3A 250V AC (resistive load) Relay contact 1a 1A 250V AC ( $\cos \phi = 0.4$ ) Electrical life: 100000 times						
Control method		PID action (with auto-tuning function), PI action, PD action (with manual reset function), P action (with manual reset function), ON / OFF action					
Program control function		1 pattern, 9-step setting is possible Note: The function for the OUT/OFF key needs to be set to "Program control".					
Indication accuracy	Thermocouple	Within $\pm 0.2\%$ of each input span + 1 digit or within $\pm 2^\circ\text{C}$ (whichever is greater) R or S input: Within $\pm 6^\circ\text{C}$ in the range of 0 to 200°C B input in the range of 0 to 300°C: Accuracy is not guaranteed. K, J, E, T, and N when input is less than 0°C: within $\pm 0.4\%$ of the input span $\pm 1$ digit					
		RTD	Within $\pm (0.1\% + 1 \text{ digit})$ of each input span or $\pm 1^\circ\text{C}$ whichever is greater				
	DC current and DC voltage	Within $\pm (0.2\% + 1 \text{ digit})$ of each input span					
Sampling period		125ms					



Model	KT4R	KT8R	KT9R
Hysteresis (ON/OFF)	Thermocouple and RTD: 0.1 to 1000.0°C DC current and DC voltage: 1 to 10000 (the decimal point place follows the selection)		
Proportional band	Input without decimal point: 0 to input span Input with decimal point: 0.0 to input span DC current and DC voltage: 0.0 to 1000.0 %		
Integral time	0 to 3600 seconds		
Derivative time	0 to 1800 seconds		
Proportional cycle	1 to 120 seconds		
Allowable voltage fluctuation	When 100 to 240V AC: 85 to 264V AC When 24V AC / DC: 20 to 28V AC / DC		
Insulated resistance	500V DC, min. 10 MΩ		
Breakdown voltage	Between input/output terminal and power terminal: 1.5kV AC for 1 minute		
Malfunction vibration	10 to 55 Hz (1 cycle/minute), single amplitude: 0.35mm (10 minutes on 3 axes)		
Breakdown vibration	10 to 55 Hz (1 cycle/minute), single amplitude: 0.75mm (1 hour on 3 axes)		
Malfunction shock	X, Y and Z each direction for 5 times 98m/s <sup>2</sup> (10G)		
Breakdown shock	X, Y and Z each direction for 5 times 294m/s <sup>2</sup> (30G)		
Ambient temperature	-10 to 55°C		
Ambient humidity	35 to 85% RH (no condensation)		
Weight	Approx. 110g	Approx. 160g	Approx. 220g
Degree of protection	IP66 (applicable only to the front panel subject to rubber gasket employed)		
Display character height	PV: 12.4mm SV: 8.8mm		PV: 14mm SV: 14mm
Degree of protection	IP66 (applicable only to the front panel subject to rubber gasket employed)		
Standards	EMC directive	EN61000-6-4/EN61000-6-2	
	Low-voltage directive	EN61010-1/IEC61010-1	
Options	Heating/Cooling control	Heating and cooling control with 2nd optional control output (relay, non-contact voltage, or current) when the function has been allocated to EV2. Non-contact voltage: —	—
	Communication function	Via RS485, see table below	—
Accessories	Installation frame	Included with controller	
	Terminal cover	Sold separately	
	Rubber gasket	Included with controller	

Communication specifications	KT4R
Communication method	Half-duplex
Baud rate	Select 9600, 19200 or 38400 bps using the keys
Synchronous method	Asynchronous
Transmission code	Modbus (RTU, ASCII), MEWTOCOL (Slave)
Coding	Binary / ASCII
Error correction	Command resending
Error detection	Parity check and check sum
Data structure	Start bit: 1 Data length: 7, 8 bits (for Modbus RTU: 8 bits only) Parity: None/Odd/Even Stop bits: 1 bit / 2 bits
Interface	EIA RS485 compliant
Number of nodes	31
Maximum communication distance	1000 m (cable resistance must be within 50Ω)

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Europe

Asia Pacific

China

Japan

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