

KT4H Temperature Controller

Related Information ■ Precautions in using P.1318



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Features

- Better visibility
- Space savings (Depth 56 mm **2.205 in**)
- Ability to use any sensor (input) is inherited from KT Series
- Easier operation
- Improved communication functions
- Improved control functions
- Improved control performance (option)

DIN=48

IP66

Compact short-body temperature controller loaded with functions

PRODUCT TYPES

KT4H series

Base model	Power supply	Sensor input	Control output	Alarm output	Heating/cooling control	Heater burnout alarm	Communications function	Description		
AKT4H	1 2	1						100 to 240 V AC		
									24 V AC / DC	
									Multi-input (Thermocouple, RTD, DC Voltage and DC Current)	
			1						Relay contact	
			2						Non-contact voltage (for SSR drive)	
			3				0		DC current Heater burn-out alarm not possible.	
					1				1 point (1a)	
					2		0		2 points (1a + 1a) Heating / cooling control output not possible.	
							0		Not available	
							1	0	Relay contact Heater burn-out alarm not possible.	
							2	0	Non-contact voltage (for SSR drive) Heater burn-out alarm not possible.	
								0	Not available	
					1 or 2		0	3	Single phase 20 A (Note 1)	
					1 or 2		0	4	Single phase 50 A (Note 1)	
					1 or 2		0	5	Three phase 20 A (Note 1)	
					1 or 2		0	6	Three phase 50 A (Note 1)	
									Blank	Not available
									1	Serial communication RS-485
							2	Contact input		

Notes: 1) Not available if the control output is of the DC output type. Not available when the heating/cooling control is selected.
 2) CT1 or CT2 for current transformer is provided as an accessory when heater burn-out alarm function is added.
 3) Under some conditions, option functions (shaded items) may not be available; please check the "Descriptions" of the above table for non-functioning circumstances.

Part No. search You can easily select part numbers and search for specifications on our website.
 (Ex) Part No. when the optional functions (Heating/Cooling control + communication function) are added on to the basic model is as follows;
 Part No.: **AKT4H1111101**

Options

Product name	Part No.
Shunt resistor (for Current input)	AKT4810
Terminal cover	AKT4H801
Tool cable	AKT4H820
Installation frame (For KT4, KT4H and KT4B)	AKW4822

Setting software

Product name	Descriptions	Remarks
KT Monitor	Editing of all types of data, File saving Monitoring of readings, Saving of log files	Available for download at no charge from our website

Note: Please download user's manual from our website.

- FIBER SENSORS
- LASER SENSORS
- PHOTOELECTRIC SENSORS
- MICRO PHOTOELECTRIC SENSORS
- AREA SENSORS
- LIGHT CURTAINS
- PRESSURE / FLOW SENSORS
- INDUCTIVE PROXIMITY SENSORS
- PARTICULAR USE SENSORS
- SENSOR OPTIONS
- SIMPLE WIRE-SAVING UNITS
- WIRE-SAVING SYSTEMS
- MEASUREMENT SENSORS
- STATIC CONTROL DEVICES
- ENDOSCOPE
- LASER MARKERS
- PLC / TERMINALS
- HUMAN MACHINE INTERFACES
- ENERGY CONSUMPTION VISUALIZATION COMPONENTS
- FA COMPONENTS
- MACHINE VISION SYSTEMS
- UV CURING SYSTEMS
- Timers
- Time Switches
- Counters
- Hour Meters
- Options
- Limit Switches
- Fan Motors
- Temperature Controllers

KT4H

KT4B

KT series

KT4B Temperature Controller

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Compact short-body temperature controller loaded with functions

Features

- **Better visibility**
- **Space savings (Depth 56 mm 2.205 in)**
- **Ability to use any sensor (input) is inherited from KT Series**
- **Easier operation**
- **Improved communication functions**
- **Improved control functions**
- **Improved control performance (option)**

DIN48

IP66

PRODUCT TYPES

KT4B Series

Base model	Power supply	Sensor input	Control output	Alarm output	Heating/cooling control	Heater burnout alarm	Communications function	Part No.		
AKT4B	1 (100 to 240 V AC)	1 (Multi-input)	1 (Relay contact)	1 (1 point)	0 (Not available)	0 (Not available)	Blank (Not available)	AKT4B111100		
				2 (2 points)			1 (Serial communication)	AKT4B1111001		
				2 (Non-contact voltage)			1 (1 point)	Blank (Not available)	AKT4B112100	
							2 (2 points)	1 (Serial communication)	AKT4B1121001	
							3 (DC current)	1 (1 point)	Blank (Not available)	AKT4B113100
								2 (2 points)	1 (Serial communication)	AKT4B1131001
			3 (DC current)	1 (1 point)			Blank (Not available)	AKT4B112200		
				2 (2 points)			1 (Serial communication)	AKT4B1122001		
				3 (DC current)			1 (1 point)	Blank (Not available)	AKT4B113200	
							2 (2 points)	1 (Serial communication)	AKT4B1132001	

Notes: 1) Please inquire if you need specifications not included in the part numbers above.
2) Use RS485 for serial communication.

Part No. search You can easily select part numbers and search for specifications on our website.

(Ex) Part No.: **AKT4B111100**

Specifications: Power supply 100 to 240 V AC, Heating/cooling control: Not available, Sensor input: Multi-input, Heater burnout alarm: Not available, Control output: Relay contact, Communications function: Not available, Alarm output: 1 point

Options

Product name	Part No.
Shunt resistor (for Current input)	AKT4810
Terminal cover	AKT4H801
Tool cable	AKT4H820
Installation frame (For KT4, KT4H and KT4B)	AKW4822

Setting software

Product name	Descriptions	Remarks
KT Monitor	Editing of all types of data, File saving Monitoring of readings, Saving of log files	Available for download at no charge from our website

Note: Please download user's manual from our website.

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LASER SENSORS

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MICRO PHOTOELECTRIC SENSORS

AREA SENSORS

LIGHT CURTAINS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC CONTROL DEVICES

ENDOSCOPE

LASER MARKERS

PLC / TERMINALS

HUMAN MACHINE INTERFACES

ENERGY CONSUMPTION VISUALIZATION COMPONENTS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Timers

Time Switches

Counters

Hour Meters

Options

Limit Switches

Fan Motors

Temperature Controllers

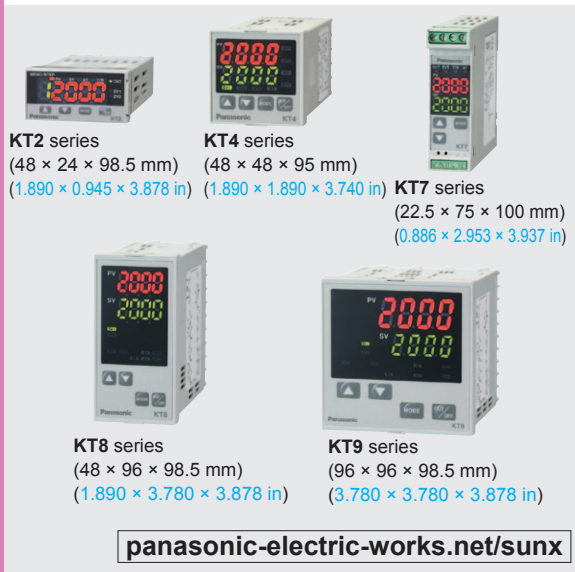
KT4H

KT4B

KT series

KT Temperature Controller

Related Information ■ Precautions in using P.1318



Features

- Multi-input
- Simple operation enables highly accurate temperature control
- DIN Rail mounting types are aligned taking global market demand into consideration (KT7 series)
- Nine step pattern control possible. (KT2 series)
- Communication specification uses RS485 (MODBUS protocol)
*Modbus Protocol is the communication protocol for PLC, developed by Modicon Inc.
- The KT series complies with UL, CSA standards and CE marking.
- Reasonable price

Broad lineup of temperature controllers allow you to satisfy application and space requirements.

PRODUCT TYPES

KT2 series

Base model	Power supply	Sensor input	Control output	Alarm output	Heating/cooling control	Heater burnout alarm	Communications function	Description
AKT2								48 × 24 × 98.5 mm 1.890 × 0.945 × 3.878 in
	1							100 to 240 V AC
	2							24 V AC / DC
		1						Multi-input (Thermocouple, RTD, DC current and DC voltage)
			1					Relay contact output 1a 250 V AC 3 A
			2					Non-contact voltage output (for SSR drive)
			3					Current output
				2	0	0	Blank	When both heating/cooling and communication functions are not added: Relay contact output (alarm 1): Can be used Open collector output (alarm 2): Can be used
				1	1	0	Blank	When only heating/cooling function is added: Relay contact output (alarm 1): Can be used Open collector output (alarm 2): Can be used
				1	0	0	1	When only communication function is added: Relay contact output (alarm 1): Can be used Open collector output (alarm 2): Cannot be used
				0	1	0	1	When both heating/cooling and communication functions are added: Relay contact output (alarm 1): Cannot be used Open collector output (alarm 2): Cannot be used

Notes: 1) When heating/cooling is selected, alarm output 1 cannot be used.
2) When the communication function is selected, alarm output 2 cannot be used.

Part No. search

You can easily select part numbers and search for specifications on our website.

(Ex) Part No. when the optional functions (of Heating/Cooling control: Relay contact output + Communications function) is added on to the basic model is as follows;
The optional functions are only the following four patterns.
AKT2*1*200 Blank AKT2*1*110 Blank
AKT2*1*1001 AKT2*1*0101

Part No.: **AKT21110101**

Options

Product name	Part No.
Shunt resistor (for Current input)	AKT4810
Terminal cover	AKT2801

Note: When Current input is specified, a shunt resistor (sold separately) is required.

- FIBER SENSORS
- LASER SENSORS
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- ENDOSCOPE
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- PLC / TERMINALS
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- FA COMPONENTS
- MACHINE VISION SYSTEMS
- UV CURING SYSTEMS
- Timers
- Time Switches
- Counters
- Hour Meters
- Options
- Limit Switches
- Fan Motors
- Temperature Controllers
- KT4H
- KT4B
- KT series

KT4 series

Base model	Power supply	Sensor input	Control output	Alarm output	Heating/cooling control	Heater burnout alarm	Communications function	Description
AKT4								48 × 48 × 95 mm 1.890 × 1.890 × 3.740 in
	1							100 to 240 V AC
	2							24 V AC / DC
			1					Multi-input (Thermocouple, RTD, DC Voltage and DC Current)
				1				Relay contact output 1a 250 V AC 3 A
				2				Non-contact voltage output (for SSR drive)
				3				Current output
					1			Relay contact output 1a (Alarm output 1)
					2			Relay contact output 1a (Alarm output 2)
						0		Not available
						4		SSR output 0.3 A 250 V AC (Heating/Cooling control not supported when alarm output 2 is selected)
							0	Not available
							1	5 A (Note 1)
							2	10 A (Note 1)
							3	20 A (Note 1)
							4	50 A (Note 1)
								Not available
						1	Available	

Notes: 1) Not available if the control output is of the current output type. Not available when the heating/cooling control is selected.
 2) CT1 or CT2 for current detection is provided as an accessory when heater burn-out alarm function is added.
 3) Event output will be shared if you choose alarm output 2 and the heater burnout alarm.

Part No. search

You can easily select part numbers and search for specifications on our website.

(Ex) Part No. when the optional functions (of Heating/Cooling control: SSR output + Communications function) is added on to the basic model is as follows;

Part No.: **AKT4111401**

Options

Product name	Part No.
Shunt resistor (for Current input)	AKT4810
Terminal cover	AKT4801
Installation frame (For KT4, KT4H and KT4B)	AKW4822

Note: When Current input is specified, a shunt resistor (sold separately) is required.

KT7 Series

Base model	Power supply	Sensor input	Control output	Alarm output	Heating/cooling control	Heater burnout alarm	Communications function	Description
AKT7								22.5 × 75 × 100 mm 0.886 × 2.953 × 3.937 in
	1							100 to 240 V AC
	2							24 V AC / DC
			1					Multi-input (Thermocouple, RTD, DC Voltage and DC Current)
				1				Relay contact output 1a 250 V AC 3 A
				2				Non-contact voltage output (for SSR drive)
				3				Current output
					1			Open collector output (Alarm output 1)
						0		Not available (without Heating/Cooling function)
							0	Not available
							1	5 A (Note 1) Open collector output
							2	10 A (Note 1) Open collector output
							3	20 A (Note 1) Open collector output
							4	50 A (Note 1) Open collector output
								Not available
							1	Available

Notes: 1) Not available if the control output is of the current output type.
 2) CT1 or CT2 for current detection is provided as an accessory when heater burn-out alarm function is added.
 3) Event output will be shared if you choose alarm output 1 and the heater burnout alarm.

Part No. search

You can easily select part numbers and search for specifications on our website.

(Ex) Part No. when the optional function (of Heater burnout alarm: 10A) is added on to the base model is as follows;

Part No.: **AKT7111102**

Options

Product name	Part No.
Shunt resistor (for Current input)	AKT4811
Mounting rail	AT8-DLA1
Mounting plate	ATA4806

Note: When Current input is specified, a shunt resistor (sold separately) is required.

FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT CURTAINS

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INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

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FA COMPONENTS

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UV CURING SYSTEMS

Timers

Time Switches

Counters

Hour Meters

Options

Limit Switches

Fan Motors

Temperature Controllers

KT4H

KT4B

KT series

KT8 series

Base model	Power supply	Sensor input	Control output	Alarm output	Heating/cooling control	Heater burnout alarm	Communications function	Description
AKT8								48 × 96 × 98.5 mm 1.890 × 3.780 × 3.878 in
	1							100 to 240 V AC
	2							24 V AC / DC
		1						Multi-input (Thermocouple, RTD, DC Voltage and DC Current)
			1					Relay contact output 1a1b 250 V AC 3 A
			2					Non-contact voltage output (for SSR drive)
			3					Current output
				1				Relay contact output 1a (Alarm output 1)
				2				Relay contact output 1a (Alarm output 2)
					0			Not available
					1			Relay contact output 1a
					2			Non-contact voltage output (for SSR drive)
					3			Current output
						0		Not available
						1		5 A (Note 1)
						2		10 A (Note 1)
						3		20 A (Note 1)
						4		50 A (Note 1)
								Not available
							1	Available

Notes: 1) Not available if the control output is of the current output type. Not available when the heating/cooling control is selected.
 2) CT1 or CT2 for current detection is provided as an accessory when heater burn-out alarm function is added.
 3) If a communication function is added, second main setup is not possible.

Part No. search

You can easily select part numbers and search for specifications on our website.

(Ex) Part No. when the optional functions (of Alarm output; Alarm output 2 + Heating/Cooling control: Current output) are added on to the basic model is as follows;

Part No.: **AKT8111230**

Options

Product name	Part No.
Shunt resistor (for Current input)	AKT4810
Terminal cover	AKT8801
Mounting frame (For KT8)	AKW8822

Note: When Current input is specified, a shunt resistor (sold separately) is required.

KT9 series

Base model	Power supply	Sensor input	Control output	Alarm output	Heating/cooling control	Heater burnout alarm	Communications function	Description
AKT9								96 × 96 × 98.5 mm 3.780 × 3.780 × 3.878 in
	1							100 to 240 V AC
	2							24 V AC / DC
		1						Multi-input (Thermocouple, RTD, DC Voltage and DC Current)
			1					Relay contact output 1a1b 250 V AC 3 A
			2					Non-contact voltage output (for SSR drive)
			3					Current output
				1				Relay contact output 1a (Alarm output 1)
				2				Relay contact output 1a (Alarm output 2)
					0			Not available
					1			Relay contact output 1a
					2			Non-contact voltage output (for SSR drive)
					3			Current output
						0		Not available
						1		5 A (Note 1)
						2		10 A (Note 1)
						3		20 A (Note 1)
						4		50 A (Note 1)
								Not available
							1	Available

Notes: 1) Not available if the control output is of the current output type. Not available when the heating/cooling control is selected.
 2) CT1 or CT2 for current detection is provided as an accessory when heater burn-out alarm function is added.
 3) If a communication function is added, second main setup is not possible.

Part No. search

You can easily select part numbers and search for specifications on our website.

(Ex) Part No. when the optional functions (of Alarm output; Alarm output 2 + Heating/Cooling control: Non-contact voltage output) are added on to the basic model is as follows;

Part No.: **AKT9111220**

Options

Product name	Part No.
Shunt resistor (for Current input)	AKT4810
Terminal cover	AKT9801

Note: When Current input is specified, a shunt resistor (sold separately) is required.

PRECAUTIONS IN USING TEMPERATURE CONTROLLER

Notice on site circumstances

This instrument is intended to be used in the following environment (IEC61010-1)

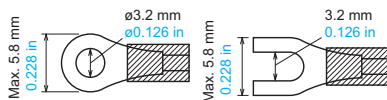
Overvoltage category II, Pollution degree 2 Mount the controller in a place with:

- A minimum of dust, and an absence of corrosive gases
- No flammable, explosive gases
- Few mechanical vibrations or shocks
- No exposure to direct sunlight, an ambient temperature of 0 to 50 °C (32 to 122 °F) that does not change rapidly. (When installing inside a panel, make particular allowance for heat dissipation. Avoid installation in situations such as above equipment that generates heat.)
- Locations in which temperature rapidly changes may cause condensation.
- Locations or atmospheres in which gasoline, thinners, alcohol, or other organic solvents are present, or in which ammonia, sodium hydroxide, or other strong alkaline substances may be here.
- Locations susceptible to direct impact or the transmission of vibrations, or where splashing with water is possible.
- In the proximity of equipment in which large switching surges occur or near high-voltage cables, high-voltage equipment, power lines, power equipment, ham radio transmitters, or equipment containing these or similar devices.
- An ambient non-condensing humidity of 35 to 85 % RH
- No large capacity electromagnetic switches or cables through which large current is flowing.
- No water, oil or chemicals or where the vapors of these substances can come into direct contact with the controller.

Notice on the wiring

- The terminal block of KT4, 8, 9, 4H, 4B series are designed to be wired from the left side (KT2 series are designed to be wired from the upper and lower direction). The lead wire must be inserted from the left side of the terminal, and fastened by the terminal screw. Use a solderless terminal with insulation sleeve that fits to the M3 screw.

Wire-pressed terminal	Company name	Part No.	Fastening torque
Fork type	NICHIFU Co., Ltd.	1.25Y-3	0.6 N·m Max. 1.0 N·m
	J.S.T. Mfg. Co., Ltd.	VD1.25-B3A	
Round type	NICHIFU Co., Ltd.	1.25-3	
	J.S.T. Mfg. Co., Ltd.	V1.25-3	



- Terminal fastening torque is approximately 0.6 N·m to 1.0 N·m (KT4, 8, 9, 4H and 4B). For KT7 series by M3.0 screw is less than 0.5 N·m and by M2.0 screw is less than 0.25 N·m respectively.
- Use a thermocouple and compensating lead wire according to the input specification of the controller.
- Use a 3-wire system of RTD according to the input specification of the controller.
- This controller has no built-in power switch, circuit breaker or fuse. Therefore, it is necessary to install them in the circuit near the external controller. (Recommended fuse: Time-lag fuse, rated voltage 250 V AC, rated current 2 A)

- In the case of 24 V AC/DC power supply, do not confuse the polarity when it is DC.
- With the relay contact output type, use an auxiliary electromagnetic switch externally according to the capacity of the load to protect the built-in relay contact.
- When wiring, keep input wire (thermocouple, RTD, etc.) away from AC source and load wire to avoid external interference.
- Turn the power supply to the instrument off before wiring or checking. Working or touching the terminal with the power switched on may result in Electric Shock which could cause severe injury or death.
- Do not drop wire chips into the holes of vent when wiring, because they could cause fire, malfunction or trouble with the device.
- To prevent the unit from harmful effects of unexpected high level noise, it is recommended that a surge absorber be installed between the electromagnetic switch coils.

Notice on the mounting

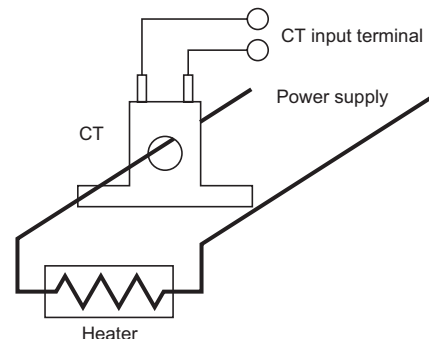
- Do not use excessive force while screwing in the mounting bracket of KT4, 8, 9, 4H and 4B series. For KT4, 8 and 9 series, recommended torque is approximately 0.12 N·m. For KT4H and 4B, recommended torque is approximately 0.05 to 0.06 N·m.
- When mounting the KT7 series to the DIN rail, mount it in a lateral direction. Make sure a click is audible when fixed into place.

Optional heater burn-out alarm output (KT4, 7, 8, 9, 4H and 4B series)

- This alarm is not available for detecting current under phase control.
- Use the current transformer (CT) provided, and pass one lead wire of the heater circuit into the hole of CT.
- When wiring, keep CT wire away from AC source and load wire to avoid external interference.

<KT4H/4B only>

- In three phase installations, ensure that R, S, and T are each connected to a 2-line CT that connects with CT1 (13-14) and CT2 (14-15) terminals.



Please use rod terminals for the terminal portion of KT7 series.

We recommend terminals made by Phoenix Contact.

① to ④ are AI0.25-8YE, AI0.34-8TQ, AI0.5-8WH, AI0.75-8GY, AI1.0-8RD, and AI1.5-8BK.

⑤ to ⑨ are AI0.25-8YE, AI0.34-8TQ, and AI0.5-8WH.

The screw tightening torque for ① to ④ should be no more than 0.5 N·m and for ⑤ to ⑨ it should be no more than 0.25 N·m. Make sure no screw is loose.

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