2ch Digital Indicating Controller

WCS-13A (48 x 48mm)

Features

User defined combination

PV difference input, Delay timer

Saves mounting space

Multiple CH2 functions

I/O type for each channel selectable

Drip-proof/Dust-proof

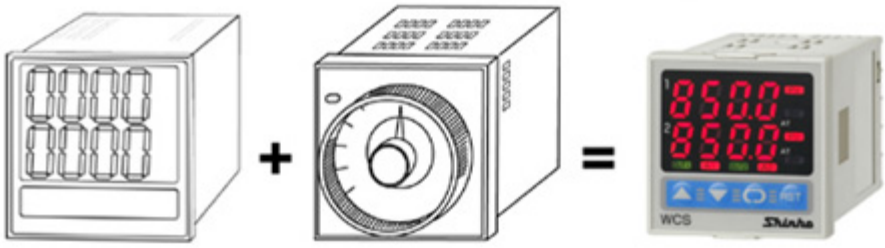
Spec Terminal arrangement Dimensions

Features

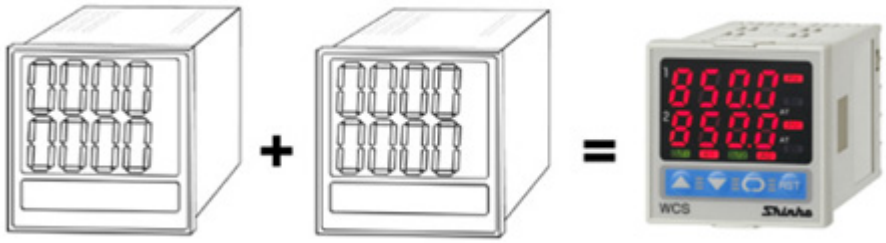
User defined combination

Controller + Timer, Dual controller

Controller + Timer



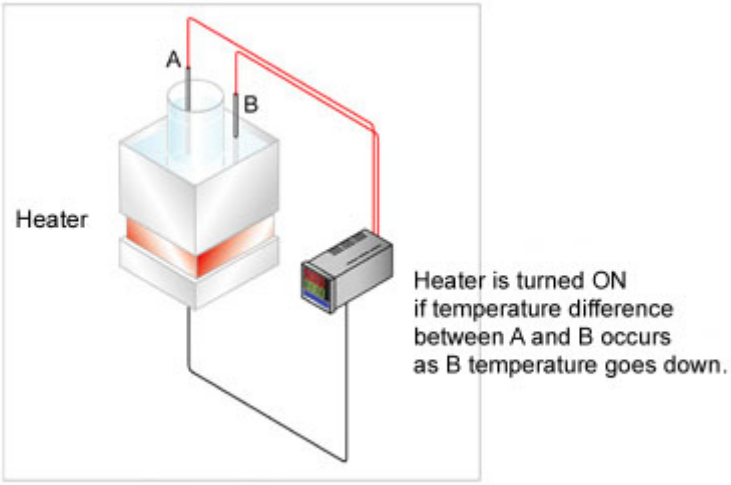
Controller + Controller



PV difference input Delay timer spec available

PV difference input and delay timer spec are provided.
□EPV difference input: Control is performed using the PV (CH1 PV-CH2 PV=PV).
□EDelay timer: Timer output occurs using the DI (digital input).

PV difference input application
The heat source (heater) is controlled to maintain a constant temperature difference between 2 points(A, B).
(e.g.) No condensation, defogging



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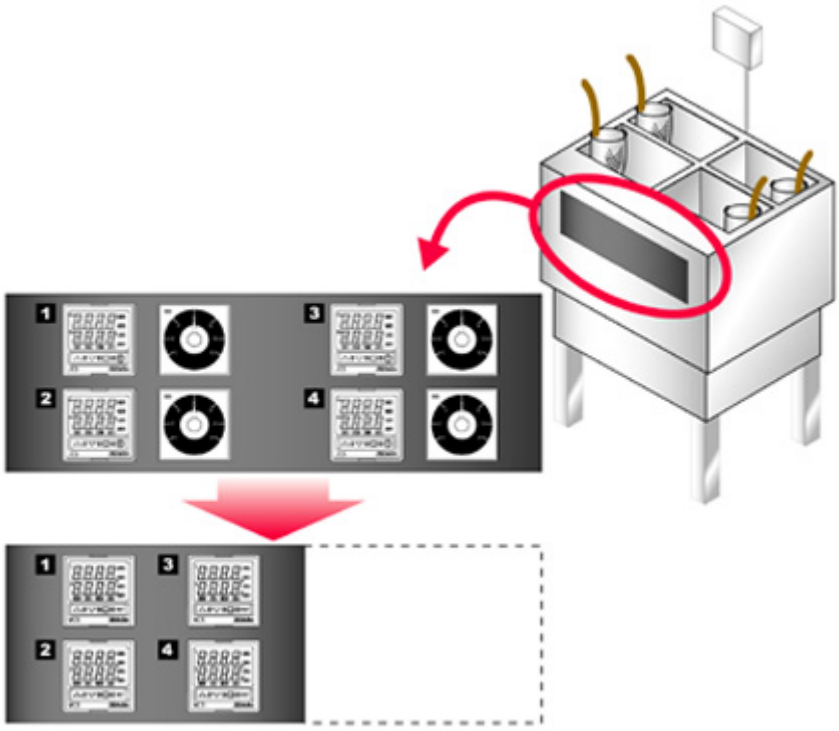
Saves mounting space

As 2-unit function can be used with one unit, mounting space can be reduced by half.

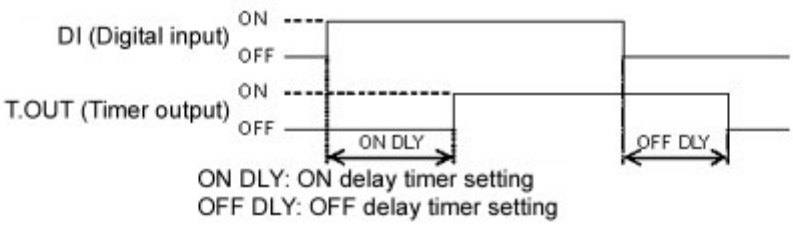


Multiple CH2 functions

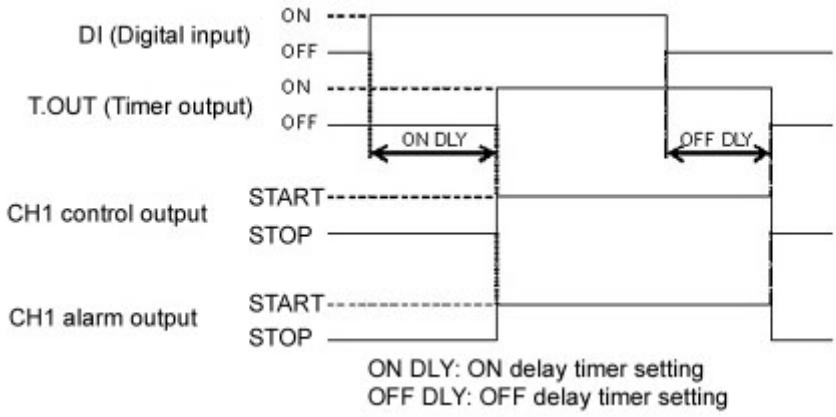
CH2 function is selectable by front keypad as follows.

[If CH2 is of Multi-range input (-M), DC voltage input(-V) or PV difference input (-S) spec]
CH2 controller (2ch controller)
CH1 output 2 (1-input 2-output)
CH1 cooling output (Heating/Cooling control output)
CH1 transmission output (effective when CH2 is DC current output type)
CH1 timer

[If CH2 is based on delay timer (-T) spec]
Delay timer 1 (independent timer output)



Delay timer 2 (Control and alarm action Start/Stop interlocked with timer output)



Input/Output type can be selected for CH1 and CH2.

When ordering, Input/Output can be selected for CH1 and CH2.
(If CH2 is based on delay timer (-T) spec, CH2 control output is not available)

[Input]
Multi-range input
Thermocouple, RTD, DC current, DC voltage (only 0-1V DC) can be selected by keypad.
DC voltage input
0-5V DC, 1-5V DC, 0-10V DC can be selected by keypad.
Delay timer
□EPV difference input

[Control output]
Relay contact: 1a
Non-contact voltage (SSR drive): 12V DC±15%
DC current: 4-20mA DC

Drip-proof/Dust-proof

IP66 structure allows usage in harsh environments when the controller is exposed to water or dust.

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Specifications

Rating

Rated scale: Multi-range input

Input	Scale range	
K	-200 to 1370℃	-320 to 2500℉
K	-199.9 to 400.0℃	-199.9 to 750.0℉
J	-200 to 1000℃	-320 to 1800℉
R	0 to 1760℃	0 to 3200℉
S	0 to 1760℃	0 to 3200℉
B	0 to 1820℃	0 to 3300℉
E	-200 to 800℃	-320 to 1500℉
T	-199.9 to 400.0℃	-199.9 to 750.0℉
N	-200 to 1300℃	-320 to 2300℉
PL-‡U	0 to 1390℃	0 to 2500℉
C(W/Re5-26)	0 to 2315℃	0 to 4200℉
Pt100	-199.9 to 850.0℃	-199.9 to 999.9℉
	-200 to 850℃	-300 to 1500℉
JPt100	-199.9 to 500.0℃	-199.9 to 900.0℉
	-200 to 500℃	-300 to 900℉

<table>
<tr><td></td><td>
<table>
<tr><td>4-20mA(*1)</td><td rowspan="3">-1999 to 9999(*2)</td></tr>
<tr><td>0-20mA(*1)</td></tr>
<tr><td>0-1V</td></tr>
</table>
(*1): For DC current input, 50Ω shunt resistor (sold separately) should be connected
(*2): For DC current and voltage input, scaling and decimal point place selection are required.

DC voltage input
<table>
<tr><td>Input</td><td>Scale range</td></tr>
<tr><td>0-5V</td><td rowspan="3">-1999 to 9999(*)</td></tr>
<tr><td>1-5V</td></tr>
<tr><td>0-10V</td></tr>
</table>
(*): For DC voltage input, scaling and decimal point place selection are required.
</td></tr>
<tr><td rowspan="5">Input</td><td>TC</td><td>K, J, R, S, B, E, T, N, PL-‡U, C(W/Re5-26)
External resistance: 100Ω or less
However, B input; External resistance 40Ω or less</td></tr>
<tr><td>RTD</td><td>Pt100, JPt100 3-wire system
Allowable input lead wire resistance: Resistance 10Ω or less per wire</td></tr>
<tr><td>DC current</td><td>0-20mA DC, 4-20mA DC
Input impedance; 50Ω (50Ω shunt resistor should be connected between input terminals)
Allowable input current; 50mA DC or less (when 50Ω shunt resistor is used)</td></tr>
<tr><td rowspan="2">DC Voltage</td><td>0-1V DC
Input impedance: 1MΩ or more, Allowable input voltage: 5V DC or less
Allowable signal source resistance: 2kΩ or less</td></tr>
<tr><td>0-5V DC, 1-5V DC, 0-10V DC
Input impedance: 100kΩ or more, Allowable input voltage: 15V DC or less
Allowable signal source resistance: 100Ω or less</td></tr>
<tr><td>Supply voltage</td><td colspan="2">100 to 240V AC 50/60Hz
24V AC/DC 50/60Hz</td></tr>
</table>

Allowable fluctuation range	85 to 264V AC 20 to 28V AC/DC

General structure

Dimensions	48x48x106.5mm (WxHxD)
Mounting	Flush (Mountable panel thickness: 1 to 8mm)
Display	CH1(CH2) PV/SV display: 8x40mm (HxW)

Indication accuracy

Accuracy (Setting, indication)	Thermocouple	Within ±0.2% of each input span±1 digit or Within ±2℃(4℉) Whichever is greater However, R, S input, 0-200℃ (0-400℉): Within ±6℃ (12℉) B input 0-300℃ (0-600℉): Accuracy is not guaranteed K, J, E, T, N input, Less than 0℃ (32℉): Within ±0.4% of each input span ±1 digit
	RTD	Within ±0.1% of each input span ±1 digit or Within ±1℃ (2℉) Whichever is greater
	DC current DC voltage	Within ±0.2% of each input span±1 digit
Input sampling period	0.5sec	
Time accuracy	Within ±0.5% of the setting time	

Control performance

Control action	PID action (with auto-tuning) PI action: When derivative time is set to 0 PD action (with auto-reset): When integral time is set to 0 P action (with auto-reset): When integral and derivative time is st to 0 ON/OFF action: When proportional band is set to 0 Proportional band(P): 0 to 1000℃ (2000℉)(DC current, voltage input: 0.0 to 100.0%) Integral time (I): 0 to 1000sec Derivative time (D): 0 to 300sec Proportional cycle: 1 to 120sec ARW: 0 to 100% ON/OFF hysteresis: 0.1 to 100.0℃(℉) (DC current, voltage input: 1 to 1000)

	Output high limit, low limit: 0 to 100% (DC current output: -5 to 105%)
Control output	Relay contact 1a, Control capacity: 3A 250V AC (resistive load), 1A 250V AC (inductive load cosϕ=0.4), Electric life: 100,000 cycles Non-contact voltage (SSR drive) 12V DC±15% Max.40mA DC (short circuit protected) DC current 4-20mA DC Load resistance: Max. 550Ω

□EStandard functions

Alarm output	Alarm type can be selected by keypad High limit alarm Low limit alarm High/Low limits alarm High/Low limit range alarm Process high alarm Process low alarm High limit alarm with standby Low limit alarm with standby High/Low limits alarm with standby Setting accuracy: The same as the indication accuracy Action: ON/OFF action Hysteresis: Thermocouple, RTD input: 0.1 to 100.0℃(℉) DC current, voltage input: 1 to 1000 Output: Relay contact 1a, Control capacity: 3A 250V AC (resistive load), Electric life: 100,000 cycles
Heating/Cooling control output	If CH1 cooling output is selected during CH2 function selection, the unit will be of 1ch Heating/Cooling control output specification. So CH1 will match OUT1 (Heating output), and CH2 will match OUT2 (Cooling output) of CH1. OUT2 proportional band: 0.0 to 10.0 times OUT1(CH1) proportional band (ON/OFF action when set to 0.0) OUT2 integral time□COUT2 derivative time: The same as those of OUT1(CH1) integral and derivative time OUT2 proportional cycle: 1 to 120sec Overlap/Dead band: Thermocouple, RTD input: -100.0 to 100.0℃(℉) DC current, voltage input: -1000 to 1000 (The placement of the decimal point place follows the selection) OUT2 ON/OFF hysteresis: Thermocouple, RTD input: 0.1 to 100.0℃(℉) DC current, voltage input: 1 to 1000 (The placement of the decimal point place follows the selection) OUT2 high limit: 0 to 100% (DC current output type: -5 to 105%) OUT2 low limit: 0 to 100% (DC current output type: -5 to 105%)

	OUT2 action mode: Air cooling (linear characteristic), Oil cooling (1.5th power of the linear characteristic), Water cooling (2nd power of the linear characteristic) Selectable by front keypad Control output: Refer to the "Control output" section.
Delay timer	Between DI terminals Open: OFF Between DI terminals Closed: ON Circuit current when closed: 6mA
Transmission output	If CH1 transmission output (Effective when CH2 is DC current output type) is selected during CH2 function selection: Converting the value (PV, SV or MV transmission) to analog signal every 0.5 seconds, outputs the value in current. Resolution: 1/8192 Current: 4-20mA DC Load resistance: Max. 550Ω Output accuracy: Within ±0.3% of the transmission output scaling span
Attached functions	Sensor correction, Set value lock, Power failure countermeasure, Self-diagnosis, Automatic cold junction temperature compensation, Burnout, Input abnormality, Warm-up indication, CH2 function selection

Options

Color Black[BK]	Panel frame, Case: Black
Terminal cover [TC]	Electric shock protection terminal cover Be sure to use this terminal cover option if the operator may be in contact with the back of the controller while it is running.

Insulation, Dielectric strength

Insulation resistance	10MΩ or more, at 500V DC
Dielectric strength	Between Input terminal - Power terminal: 1.5kV AC for 1 minute Between Output terminal - Power terminal: 1.5kV AC for 1 minute

Other

Ambient temperature	0 to 50℃
Ambient humidity	35 to 85%RH (Non-condensing)
Drip-proof/ Dust-proof	IP66 for the front panel

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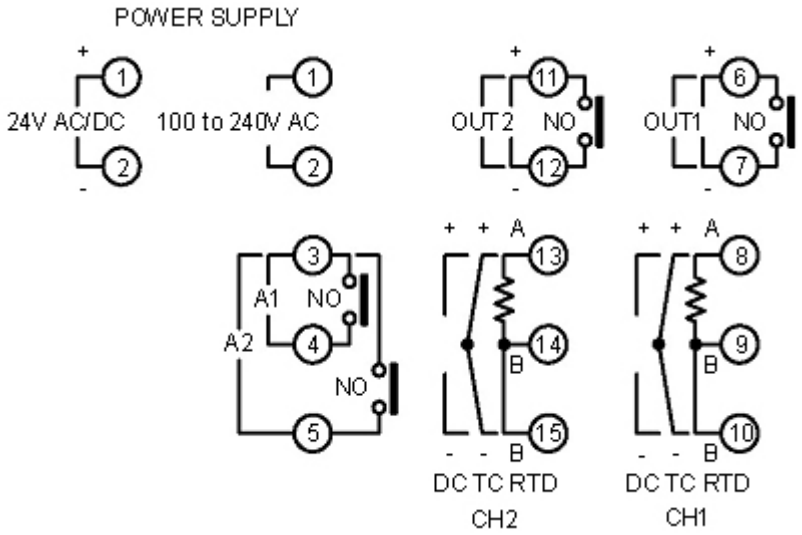
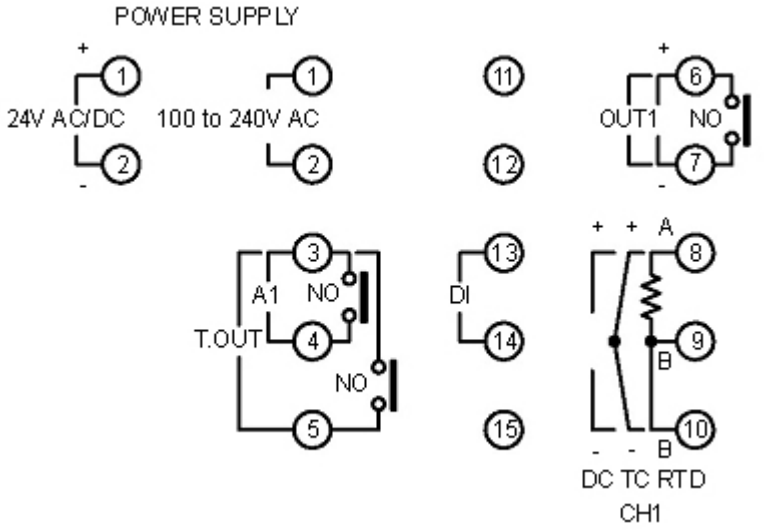
Terminal arrangement

Terminal arrangement

If CH2 is of Multi-range input (-M), DC voltage input(-V) or PV difference input (-S) spec

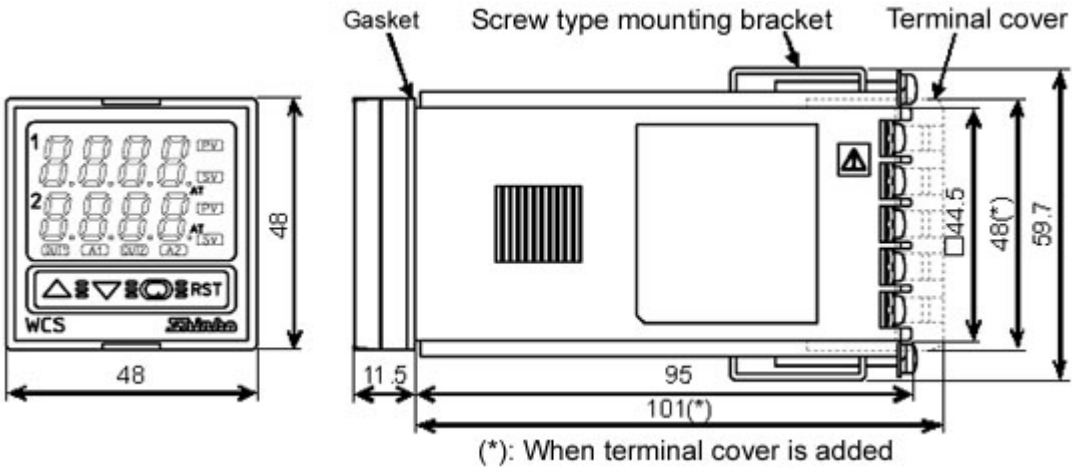


If CH2 is based on delay timer (-T) spec

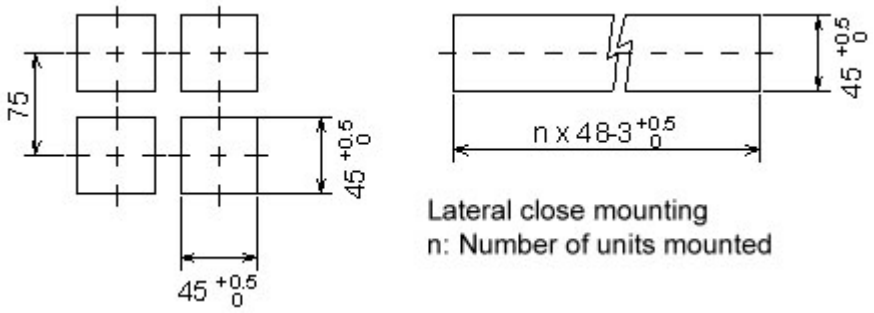


External dimensions

External dimensions (Scale: mm)



Panel cutout (Scale: mm)



Lateral close mounting
n: Number of units mounted