

°C	Series SR70 SHIMADEN DIGITAL CONTROLLER
%RH	
SHIMADEN	



BASIC FEATURES

- Multi-input and multi-range performance***
- Includes a new processing system, Expert PID, remarkably improved PID control efficiency; overshoot and undershoot are controlled effectively.***
- The keylock function can avoid erroneous operation resulting from set values or parameter settings.***
- The PV bias function can correct errors caused by sensor input.***
- A wide selection of additional functions (optional) is available to suit various needs.***

SPECIFICATIONS

Display

Digital display:	7 segments / Measured value (PV) Green LED 4 digits, Set value (SV) Orange LED 4 digits
Parameter display:	By 7 segment LEDs for PV and SV
Action display / colors:	3-type LED lamp indication <ul style="list-style-type: none">• Control output (OUT) / Green• Auto tuning (AT) / Green• Alarm (AH and AL / HB) / Red
Display accuracy:	\pm (0.5% FS+1 digit) excluding cold junction temperature compensation accuracy in the case of the thermocouple input. \pm 5% FS for temperatures below 400°C (750°F) of thermocouple B.
Display accuracy range:	23 \pm 5°C
Display resolution:	Depends on measuring range (0.1, 1)
Measured value display range:	-10~110% of measuring range (-210~680°C for -200~600°C of R.T.D. input)
Sampling cycle:	0.5 sec.

Setting

Setting:	By 4 front key switches
Setting range:	Same as the measuring range. Refer to Table of Measuring Range Codes.

Input

Type of input / measuring range:	Thermocouple, R.T.D. and voltage (mV) input types: Multi-input, Multi-range Refer to Table of Measuring Range Codes. Voltage (V) and current (4~20mA) input types: by code selection
Thermocouple:	B, R, S, K, E, J, T, N {U, L (DIN 43710)} External resistance: 100 Ω max. Input impedance: 500k Ω min. Burnout: Standard feature (up scale) Cold junction temperature compensation accuracy: \pm 2°C (5~45°C)
R.T.D.:	JIS Pt100 / JPt100 3-wire type Amperage: Approx. 0.25mA Lead wire tolerable resistance: 5 Ω max. / wire (The 3 lead wires should have same resistance.)
Voltage:	0~10, 10~50, 0~100mV DC or 0~1, 1~5, 0~10V DC Input impedance: 500k Ω min.
Current:	4~20mA DC Receiving impedance: 250 Ω
Sampling cycle:	0.5 sec.
PV bias:	\pm 20.0 unit in case the decimal point is included in the measuring range. If not, \pm 200 unit.
PV filter:	0~100 sec. (0 = without filter)
Isolation:	Insulated between input and output (not insulated between input and system, SV bias and CT input)

Control

Control mode: Auto-tuning PID control / On-Off control
 Proportional band (P): Off, 0.1~999.9% FS (Off setting: On-Off action)
 Integral time (I): 1~6000 sec.
 Derivative time (D): 0~3600 sec. (0 sec. setting: PI action)
 On - Off hysteresis: 1~999 unit
 Proportional cycle: Fixed to 20 sec. during contact output
 Fixed to 2 sec. during SSR drive voltage output
 Control output characteristics: RA / DA selectable (set RA when shipped)
 Set value function (SF): Off (Off = 0.00) and 0.01~1.00

Control output type / rating

Contact output (Y1): SR71: 240V AC 2A / resistive load: 1.2A / dielectric load
 SR72, SR73 and SR74: 240V AC 2.5A / resistive load: 1.5A / dielectric load
 Current output (I1): 4~20mA DC / load resistance: 600Ω max.
 SSR drive voltage output (P1): 15±3V DC (with load resistance at 1.5kΩ) / load current: 20mA maximum
 Voltage output (V1): 0~10V DC / load current: 2mA maximum
 Isolation: Isolated between control output and system and input

ADDITIONAL FUNCTIONS (OPTIONAL)

Alarm output

Number of alarm points: 2 (AH and AL / HB) (for both normal open and common)
 Alarm Type: Selectable from combinations of the following 9 types

0.	Not assigned		
1.	Higher limit deviation value + lower limit deviation value without inhibit action	5.	Higher limit deviation value without inhibit action + heater break
2.	Higher limit absolute value + lower limit absolute value without inhibit action	6.	Higher limit absolute value without inhibit action + heater break
3.	Higher limit deviation value + lower limit deviation value with inhibit action	7.	Higher limit deviation value with inhibit action + heater break
4.	Higher limit absolute value + lower limit absolute value with inhibit action	8.	Higher limit absolute value with inhibit action + heater break

Alarm setting range: Higher limit and lower limit absolute value alarms: Within measuring range
 Deviation value: Higher limit: 0~2000 unit*
 Lower limit: -1999~0 unit* } In case SV is out of the measuring range, higher and lower limit values of the measuring range become the action points.

Alarm action: On - Off action
 Alarm action hysteresis: Fixed to 0.2% of the measuring range
 Alarm output / rating: Contact 1a (common) / 240V AC 1.5A (resistive load)

Heater break alarm (for single phase)

(Note: This function can be added if the instrument has an alarm option and the control output is the contact type or the SSR drive voltage type. In SR71, addition is possible unless it has an SV bias option.)

Alarm action:	Heater amperage detected by externally attached CT (CT provided). Alarm output On upon detection of heater break while control output is On.
Current setting range:	Off, 0.1~50.0A (Alarm action stops when Off is set.)
Setting resolution:	0.1A
Amperage display:	0.0~55.0A
Display accuracy:	5% FS (when sine wave is 50 Hz)
Minimum time for action confirmation:	On time: 500 msec.
Alarm holding:	Selectable between Lock (holding) and Real (no holding)
Sampling cycle:	2 sec.
Isolation:	Insulated between CT input and control output (not isolated between CT input and system and other inputs)

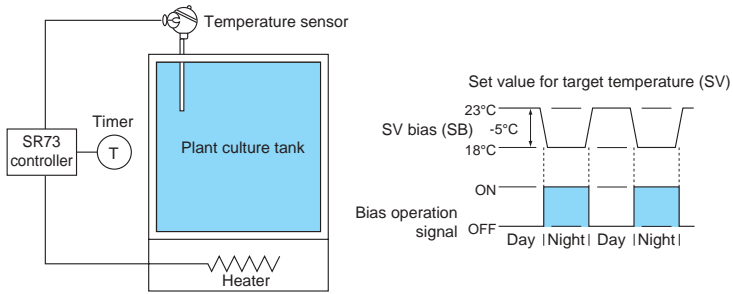
Set value bias

(Note: In case of SR71, this function can be added unless it has a Heater Break Alarm option.)

Setting range:	-1999~2000 unit
Setting resolution:	Same as display resolution
Action input:	Non-voltage contact (bias in action when SB terminal is closed)
Isolation:	Insulated between the SV bias input and the control output (not isolated between the SV bias and the system and other inputs)

Others

Data storage:	By non-volatile memory (EEPROM)
Operating ambient temperature / humidity range:	-10~50°C / 90% RH max. (no dew condensation)
Data storage temperature:	-20~+65°C
Supply voltage:	100~240V AC±10% (50 / 60 Hz)
Power consumption:	Approx. 11VA
Input noise eliminating ratio:	Normal mode: 60dB min. (50 / 60Hz) Common mode: 130dB min. (50 / 60Hz)
Applicable standard:	Safety: IEC1010-1 EMC EMI (emission): EN50081-1 EMS (immunity): EN50082-2
Insulation resistance:	Between the input / output terminal and the power supply terminal: 500V DC 20MΩ minimum Between the input / output terminal and the ground terminal: 500V DC 20MΩ minimum
Dielectric strength:	1 min. at 2300V AC between the input / output terminal and the power supply terminals 1 min. at 1500V AC between the power supply terminal and the ground terminal
Protective structure:	Only front panel has simple dust-proof and drip-proof structure
Material:	PPO resin molding (equivalent to UL94V-1)
External dimensions:	SR71: H48 × W48 × D110 (panel depth: 100) mm SR72: H72 × W72 × D110 (panel depth: 100) mm SR73: H96 × W96 × D110 (panel depth: 100) mm SR74: H96 × W48 × D110 (panel depth: 100) mm
Mounting:	Push-in panel (one-touch mount)
Panel thickness:	1.0~3.5 mm
Panel cutout:	SR71: H45 × W45mm, SR72: H68 × W68mm SR73: H92 × W92mm, SR74: H92 × W45mm
Weight:	SR71: Approx. 180g, SR72: Approx. 260g SR73: Approx. 330g, SR74: Approx. 250g



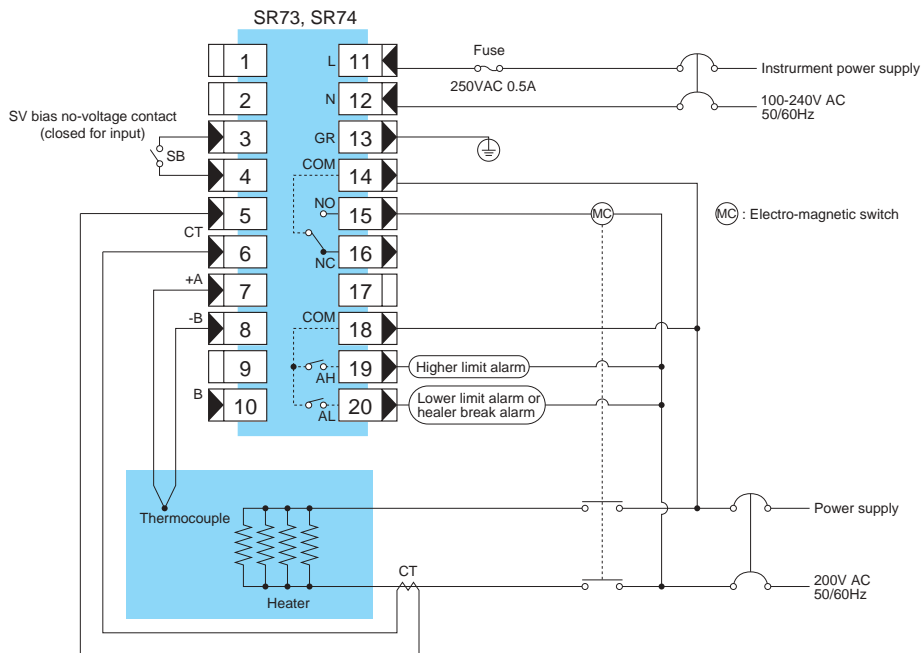
ALARM OUTPUT (OPTIONAL)

Alarm Method	Alarm Setting Range	Action
Higher limit deviation value alarm	0~2000 unit	OFF \triangle \blacktriangle ON
Lower limit deviation value alarm	-1999~0 unit	ON \blacktriangle \triangle OFF
Higher limit absolute value alarm	within measuring range	OFF \triangle \blacktriangle ON
Lower limit absolute value alarm	within measuring range	ON \blacktriangle \triangle OFF

\triangle Main setting \blacktriangle Alarm setting

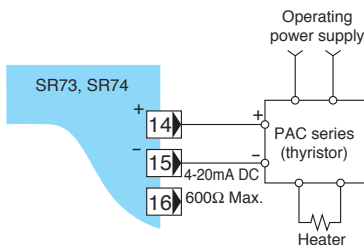
WIRING EXAMPLE

• Contact output (Y1)

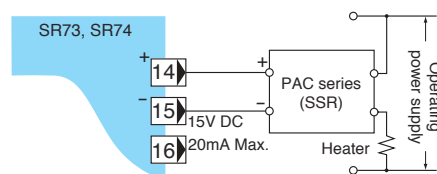


- Note: 1. The heater break alarm function (optional) can be added when the control output is of the contact (Y1) or the SSR drive voltage (P1) type.
 2. Fuse: Since the instrument does not have a built-in fuse, do not forget to install a fuse in the power circuit to be connected to the power terminal. The fuse should be positioned between the switch or the breaker and the instrument and be attached to the L side of the power terminal.
 Fuse Rating: 250V AC 0.5A / medium lagged or lagged type
 Use a fuse which meets the requirements of IEC 127.

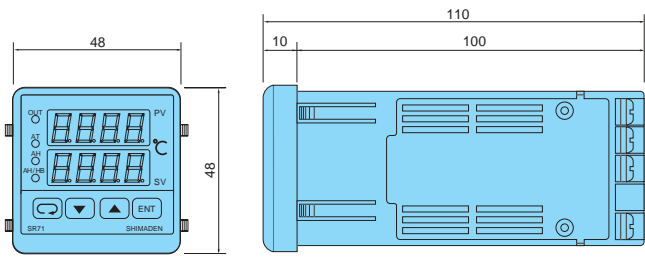
• Current output (I1) Control output portion only



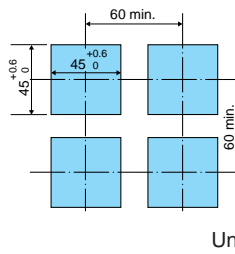
• SSR drive voltage (P1) Control output portion only



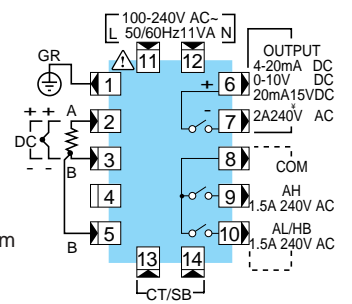
External Dimensions



Panel Cutout

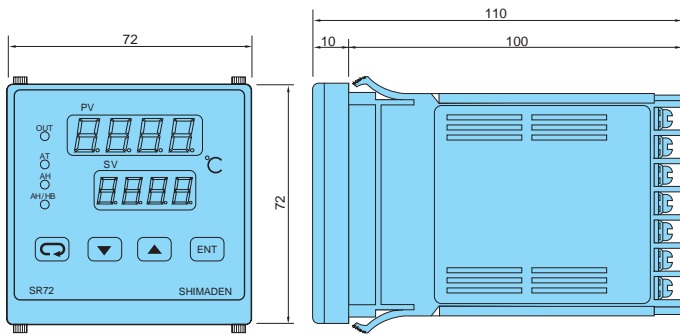


Terminal Arrangement

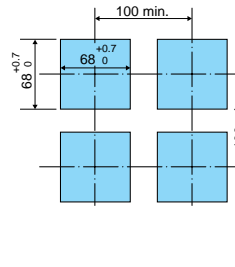


Unit : mm

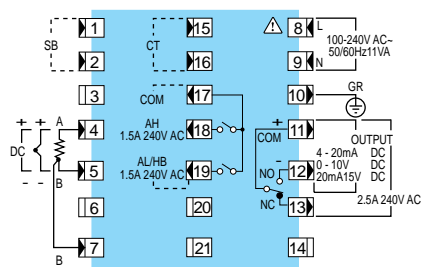
External Dimensions



Panel Cutout

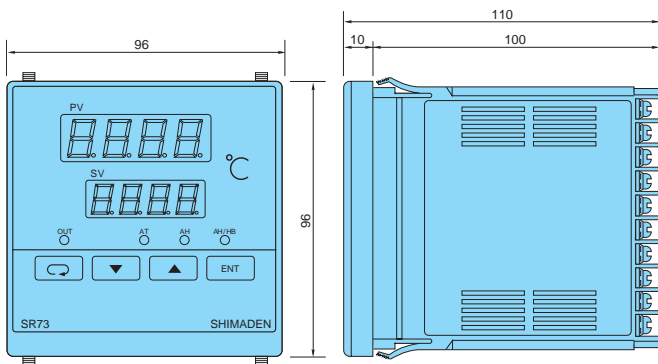


Terminal Arrangement

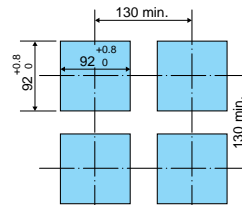


Unit : mm

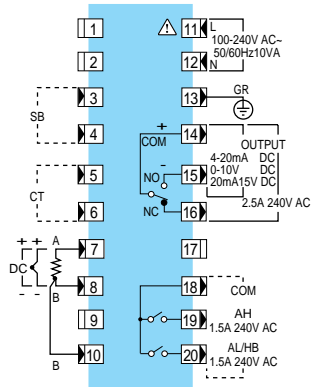
External Dimensions



Panel Cutout

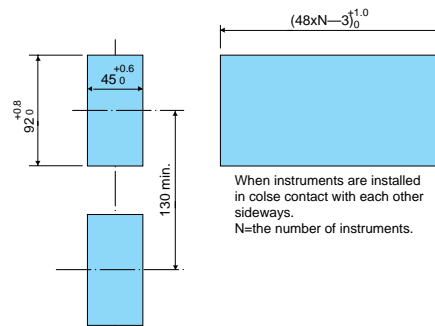
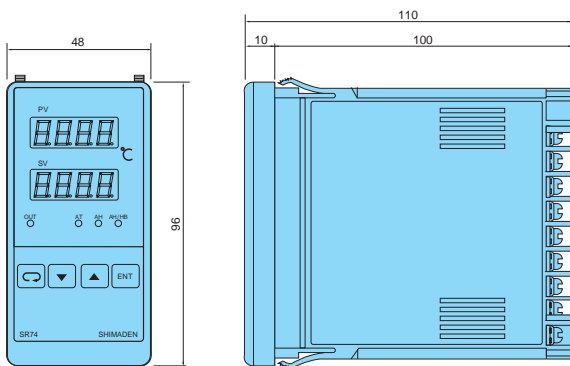


Terminal Arrangement (Common)

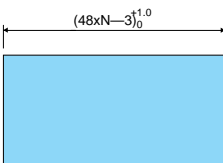


Unit : mm

• SR74



Unit : mm



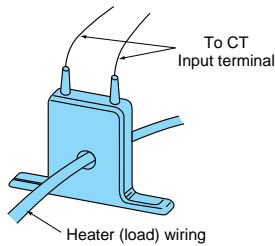
When instruments are installed in close contact with each other sideways.
N=the number of instruments.

ITEMS	CODE		SPECIFICATIONS		
SERIES	SR71-		H48×W48×D110 DIN size	digital controller for auto tuning PID control	
	SR72-		H72×W72×D110 DIN size	digital controller for auto tuning PID control	
	SR73-		H96×W96×D110 DIN size	digital controller for auto tuning PID control	
	SR74-		H96×W48×D110 DIN size	digital controller for auto tuning PID control	
INPUT	8		Multi input • Thermocouple B, R, S, K, E, J, T, N {U, L (DIN43710)} • R.T.D. Pt100 / JPt100 • Voltage (mV) 0~10, 10~50, 0~100mV DC	Value set at K 0~1200°C when shipped	
		4		Current (mA) 4~20mA DC	Value set at 4~20mA / 0~100.0 when shipped
		6		Voltage (V) 0~1, 1~5, 0~10V DC	Value set at 0~1V / 0~100.0 when shipped
CONTROL OUTPUT	Y1-		Contact (1c) Contact capacity: 240V AC 2.5A / resistive load* Proportional cycle fixed to 20 sec.	RA (heating characteristics) set when shipped	
	I1-		Current 4~20mA DC Load resistance: 600Ω max.		
	P1-		SSR drive voltage Output rating: 15V±3V DC 20mA max. Proportional cycle fixed to 2 sec.		
	V1-		Voltage 0~10V DC load current: 2mA max.		
OPTIONAL FUNCTION • Alarm • Heater break alarm (for single phase) (Selectable only for Y1 or P1 control output) • SV bias	0		None		
	1		Alarm 2 points (higher and lower limits) alarm (1a) (for both normal open and common) (Deviation / absolute value and inhibit action are selectable)	• Alarm: Higher & lower limit deviation value (without inhibit action)	
	2		Alarm + heater break alarm (can be assigned to AL / HB) Setting range: 0.0~30.0A	• Heater break alarm mode: Lock mode, set when shipped	
	3		Alarm + heater break alarm (can be assigned to AL / HB) Setting range: 0.0~50.0A		
	4		SV bias Setting range: -1999~2000 unit		
	5		Alarm + SV bias		
	6		Alarm + heater break alarm (30.0A) + SV bias (Note: Unselectable for SR71)		
	7		Alarm + heater break alarm (50.0A) + SV bias (Note: Unselectable for SR71)		
REMARKS	C		Without (for CE Marking)		
	9		With (for remarks other than CE Marking)		

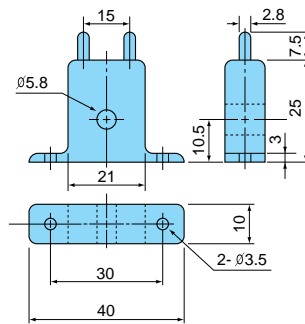
*SR71: Control output Contact (1a) Contact capacity: 240V AC 2A / resistive load

ACCESSORIES REQUIRED FOR HEATER BREAK ALARM FUNCTION (COMMON)

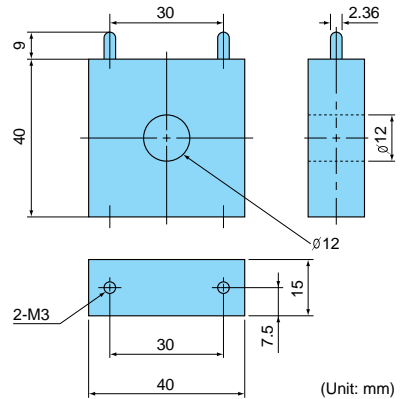
• CT wiring



• 30A (CTL-6-S)



• 50A (CTL-12-S36-8)



(Unit: mm)

MEASURING RANGE CODES

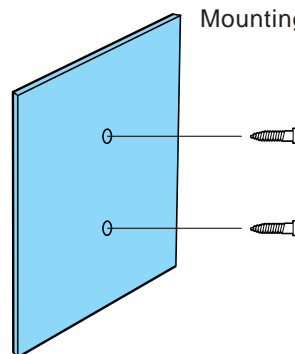
Series **SR70**

Input Type		Code	Measuring Range (°C)	Code	Measuring Range (°F)	
Multi-input	Thermocouple	B *1	01	0 ~ 1800	12	0 ~ 3300
		R	02	0 ~ 1700	13	0 ~ 3100
		S	03	0 ~ 1700	14	0 ~ 3100
		K1	04	-100 ~ 400	15	-150 ~ 750
		K2	05	0 ~ 1200	16	0 ~ 2200
		E	06	0 ~ 700	17	0 ~ 1300
		J	07	0 ~ 600	18	0 ~ 1100
		T *3	08	-199.9 ~ 200.0	19	-300 ~ 400
		N	09	0 ~ 1300	20	0 ~ 2300
		U *2	10	-199.9 ~ 200.0	21	-300 ~ 400
		L *2	11	0 ~ 600	22	0 ~ 1100
	R.T.D.	Pt100	31	-200 ~ 600	39	-300 ~ 1100
			32	-100.0 ~ 100.0	40	-150.0 ~ 200.0
			33	-50.0 ~ 50.0	41	-50.0 ~ 120.0
			34	0.0 ~ 200.0	42	0 ~ 400
		JPt100	35	-200 ~ 600	43	-300 ~ 1100
			36	-100.0 ~ 100.0	44	-150.0 ~ 200.0
			37	-50.0 ~ 50.0	45	-50.0 ~ 120.0
			38	0.0 ~ 200.0	46	0 ~ 400.0
	Voltage (mV)	0 ~ 10	71	fixed at 0.0 ~ 100.0	Note) *1 Thermocouple B: Accuracy not guaranteed for temperatures below 400°C (750°F) *2 Thermocouple U, L: DIN43710 R.T.D.Pt100: Present JIS / IEC JPt100: Former JIS *3 Thermocouple T: Accuracy not guaranteed for temperatures below -150°C, ± (0.7%FS + 1 digit)	
		10 ~ 50	72			
		0 ~ 100	73			
Voltage (V)	0 ~ 1	81	fixed at 0.0 ~ 100.0			
	1 ~ 5	82				
	0 ~ 10	83				
Current (mA)	4 ~ 20	95	fixed at 0.0 ~ 100.0			

TERMINAL COVER (AVAILABLE SEPARATELY)

Model	
SR71	SR5101-6
SR72	SR5201-6
SR73	SR5301-9
SR74	SR5401-7

Material / Appearance: PVC / transparent
 Thickness: 1 mm



Mounting: 2+B tight pan-head screws
 M2.3 × 6mm

Warning

- The SR70 series is designed for the control of temperature, humidity and other physical values of general industrial equipment. (It is not to be used for any purpose which regulates the prevention of serious effects on human life or safety.)

Caution

- If the possibility of loss or damage to your system or property as a result of failure of any part of the process exists, proper safety measures must be made before the instrument is put into use so as to prevent the occurrence of trouble.



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