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SHIMADEN

Series AR18

## SHIMADEN DIGITAL CONTROLLER



Two-setting, two-position type

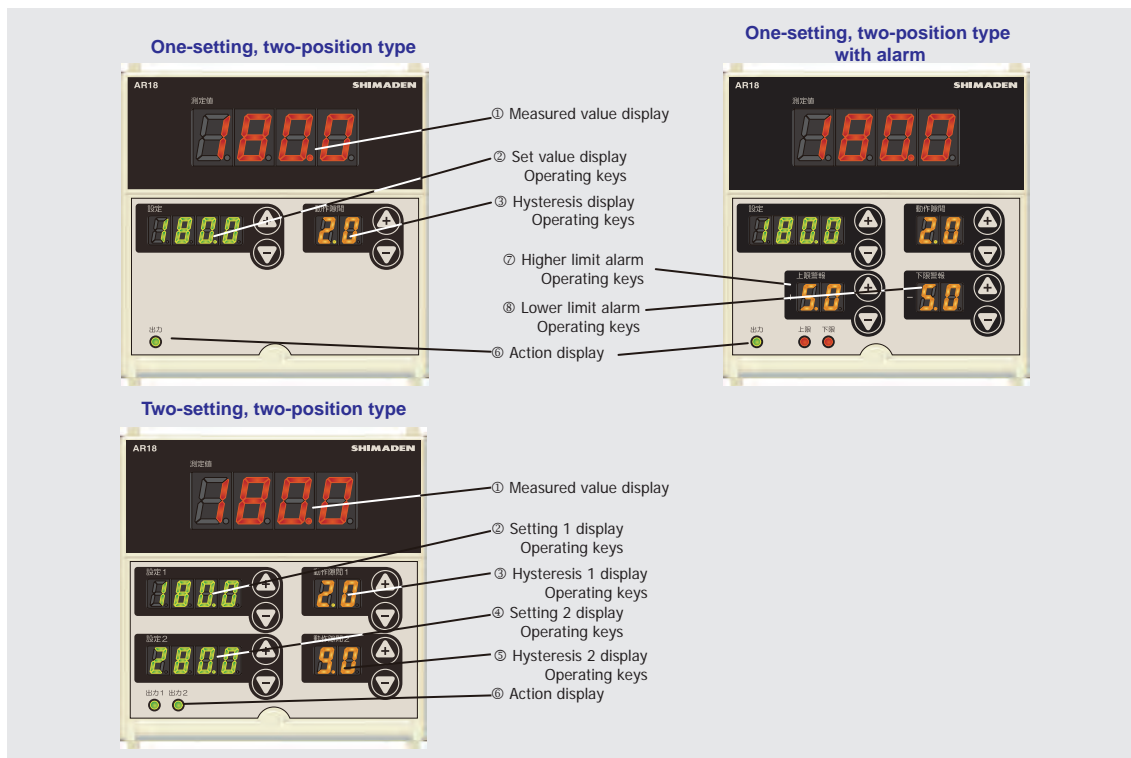
Equipped with three-position type alarm

### BASIC FEATURES

- Strong user-oriented thorough operability (settings) goodness
- Easy operation with only ▼▲ keys
- With opening and closing type key cover to prevent erroneous operation
- Variations of 1-setting 2-position, 2-setting 2-position, and 3-position types
- Contact control output can drive 5A (resistive load)
- The three-position operation display lights green when heating and red when cooling.
- Infrequently operated parameters are hidden when there is no key operation (operation gap, alarm)
- No PV display can be selected
- Dustproof and dripproof Equivalent to IP66 (front direction when panel mounted)
- RoHS directive supported

## Names and functions of parts on front panel

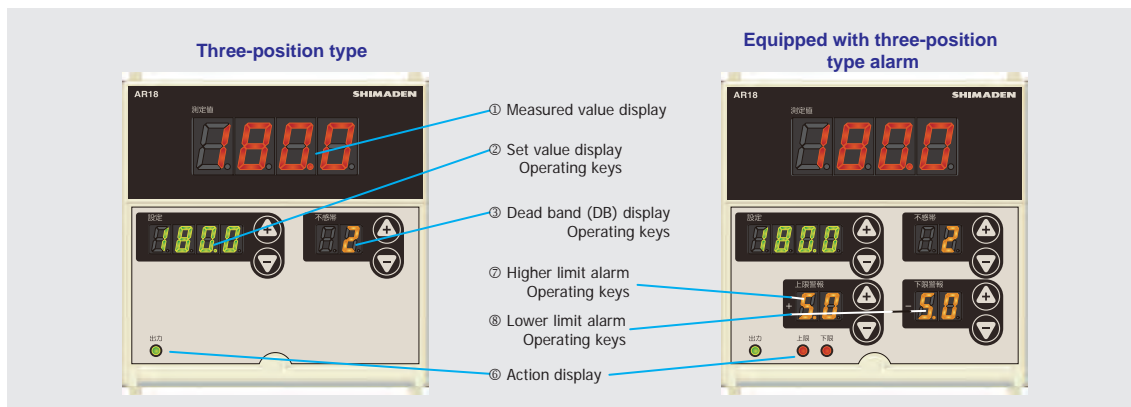
## ■ Two-position type



Name	Function	
① Measured value display	Measured value display (red LED) * Displays current measured value.	If equipped with measured value display, lights continuously when power is conducted.
② Set value display (setting 1 display)	Setting 1 set value display (green LED) * Sets/displays target set values (SV). Value is incremented by ▲ key. Value is decremented by ▼ key.	Lit constantly when conducting power  Same for setting range / measuring range
③ Hysteresis display (hysteresis display 1 display)	Setting 1 hysteresis value display (orange LED) * Sets/displays hysteresis. Value is incremented by ▲ key. Value is decremented by ▼ key.	Lamp goes off 8 seconds after setting is complete.  Setting range: 0.1 – 9.9 FS
④ Setting 2 display	Setting 2 set value display (green LED) * Sets/displays target set values (SV). Value is incremented by ▲ key. Value is decremented by ▼ key.	Lit constantly when conducting power  Same for setting range / measuring range
⑤ Hysteresis 2 display	Setting 2 hysteresis value display (orange LED) * Sets/displays hysteresis. Value is incremented by ▲ key. Value is decremented by ▼ key.	Lamp goes off 8 seconds after setting is complete.  Setting range: 0.1 – 9.9 FS
⑥ Action display	Output 1 / output 2 set value display (green LED) * Contact output form Lights when terminals 11 - 12 and 14 - 15 are shorted. * SSR drive voltage output form Lights when control output 1/2 is output. Higher limit alarm / lower limit alarm display (red LED) * Lights for higher limit alarm / lower limit alarm.	
⑦ Higher limit alarm	Higher limit alarm display (orange LED) * Sets/displays higher limit alarm. Value is incremented by ▲ key. Value is decremented by ▼ key. * Alarm set value lights for higher limit alarm (orange LED).	Lamp goes off 8 seconds after setting is complete. Setting range: Without decimal point 0 to 99, no With decimal point 0.0 to 99, no (Note that decimal points cannot be set for readings of 10 or higher.)  Does not function if “no” is set.
⑧ Lower limit alarm	Lower limit alarm display (orange LED) * Sets/displays lower limit alarm. Value is incremented by ▲ key. Value is decremented by ▼ key. * Alarm set value lights for lower limit alarm (orange LED).	Lamp goes off 8 seconds after setting is complete. Setting range: Without decimal point no, -99 to 0 With decimal point no, -99 to 0.0 (Note that decimal points cannot be set for readings of -10 or lower.)  Does not function if “no” is set.

## Names and functions of parts on front panel

## ■ Three-position type

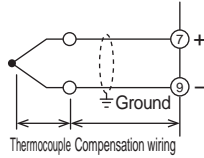


Name	Function	
① Measured value display	Measured value display (red LED) * Displays current measured value.	If equipped with measured value display, lights continuously when power is conducted.
② Set value display	Set value display (green LED) * Sets/displays target set values (SV). Value is incremented by ▲ key. Value is decremented by ▼ key.	Lit constantly when conducting power.  Same for setting range / measuring range
③ Dead band (DB) display	Dead band (DB) display (orange LED) * Sets/displays dead band (DB). Value is incremented by ▲ key. Value is decremented by ▼ key.	Lamp goes off 8 seconds after setting is complete.  Setting range: 1–99% FS
⑥ Action display	Output action display Lights when terminals 11 - 12 are shorted. (green LED) Lights when terminals 11 - 15 are shorted. (red LED) Higher limit alarm / lower limit alarm display (red LED) * Lights for higher limit alarm / lower limit alarm.	
⑦ Higher limit alarm	Higher limit alarm display (orange LED) * Sets/displays higher limit alarm. Value is incremented by ▲ key. Value is decremented by ▼ key. * Alarm set value lights for higher limit alarm (orange LED).	Lamp goes off 8 seconds after setting is complete. Setting range: Without decimal point 0–99, no With decimal point 0.0–99, no (Note that decimal points cannot be set for readings of 10 or higher.)  Does not function if “no” is set.
⑧ Lower limit alarm	Lower limit alarm display (orange LED) * Sets/displays lower limit alarm. Value is incremented by ▲ key. Value is decremented by ▼ key. * Alarm set value lights for lower limit alarm (orange LED).	Lamp goes off 8 seconds after setting is complete. Setting range: Without decimal point no, -99–0 With decimal point no, -99–0.0 (Note that decimal points cannot be set for readings of -10 or lower.)  Does not function if “no” is set.

## EXAMPLES OF USE

### Input circuit

#### 1 Thermocouple input



Be sure to wire the thermocouple with thermocouple compensation lead wire.

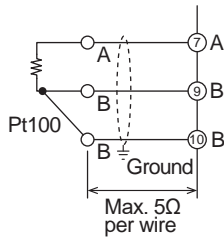
Arrange for the total resistance of thermocouple and compensation wiring to be at least 100Ω.

- Reference -

Type of thermocouple and color of compensation wiring

T = brown, J = yellow, E = purple, K = blue, S = black, R = black, B = gray

#### 2 R.T.D. input



Use 3-wire type for R.T.D. wiring, and use the same wiring material so the resistance value is the same.

The resistance value per wire should not exceed 5Ω. If connected along the way, take proper measures so contact resistance does not increase.

- Reference -

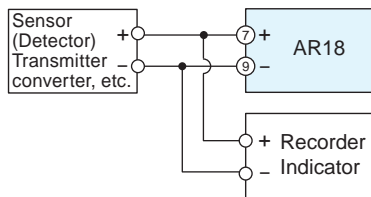
Wiring material and target max. distance

Twisted wire	0.5 mm <sup>2</sup> / approx. 100 m
	0.75 mm <sup>2</sup> / approx. 150 m

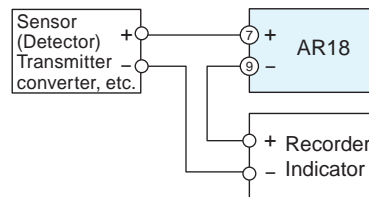
Single wire	Φ1.0 / approx. 150 m
	Φ1.2 / approx. 250 m
	Φ1.6 / approx. 400 m

### Voltage / current input

#### Voltage input

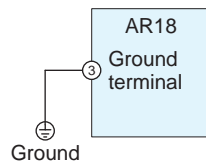


#### Current input



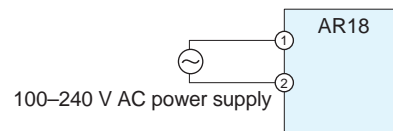
### Grounding

To ensure safety and minimize the effect of noise, be sure to ground the ground terminal.



### Power circuit

100–240 V AC can be used for the power circuit. Wire as shown in the following figure.



## EXAMPLES OF USE

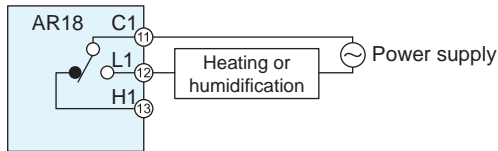
### ■ Control output circuit

The control output circuit conducts contact output / SSR drive voltage. The respective wiring methods differ. Wire while referring to the following figure.

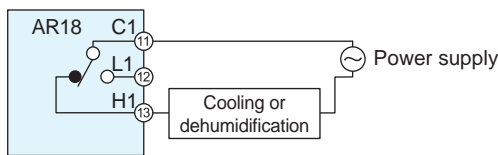
#### ① One-setting, two-position type

##### ■ Contact output form

\* Heating or humidification wiring

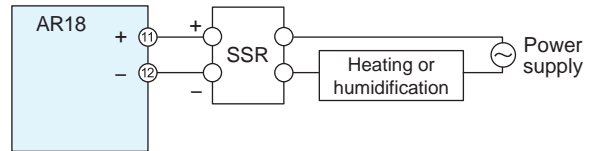


\* Cooling or humidification

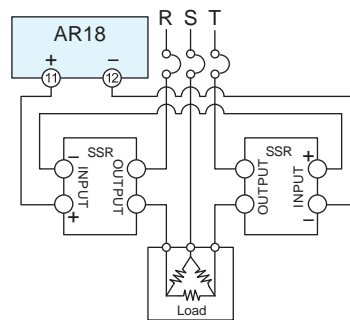


##### ■ SSR drive voltage output form

\* 1 SSR contact

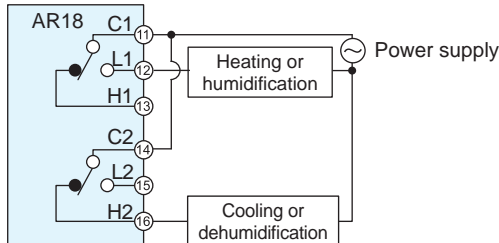


\* Using 3-phase circuit

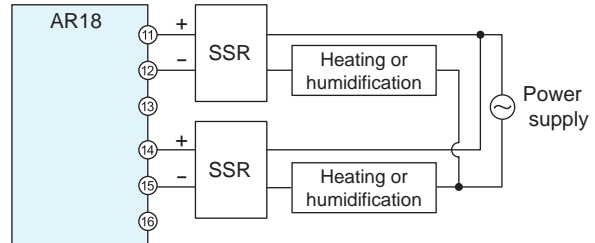


#### ② Two-setting, two-position type

##### ■ Contact output form

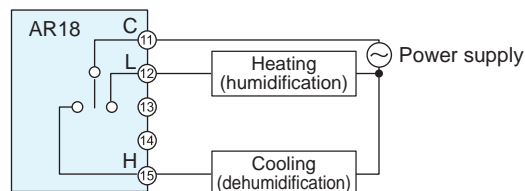


##### ■ SSR drive voltage output form

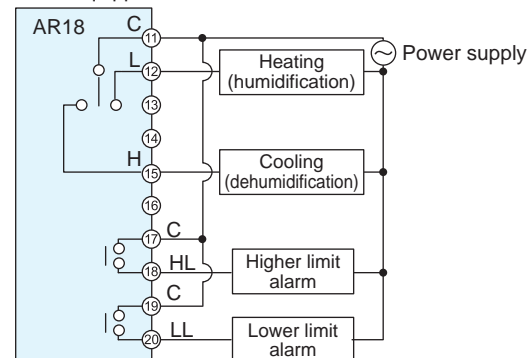


#### ③ Three-position type

Three-position control is implemented by providing a dead band (DB) for heating/cooling or humidifying/dehumidifying. Higher and lower limit action is adjusted symmetrically focusing on the setting point by dead band (DB).



\* If equipped with alarm



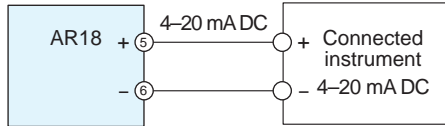
## EXAMPLES OF USE

### ■ Analog output circuit (optional)

Analog output includes “voltage output form” and “current output form.” Wire while referring to the following explanatory diagram.

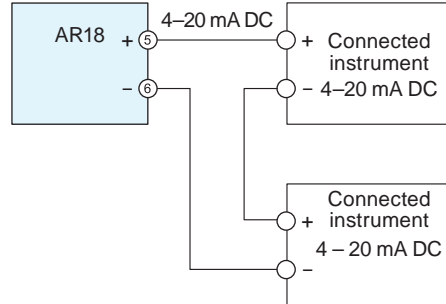
#### ■ Current output

\* If current input form instrument is connected  
(load resistance 300Ω max.)



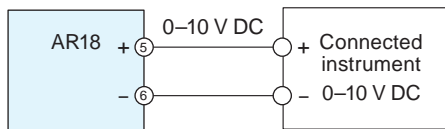
Note: If 1-5 V input form instrument is connected, mount an external 250Ω resistor (at least 1/4 W).

\* If 2 loads are connected  
(load resistance 300Ω max.)

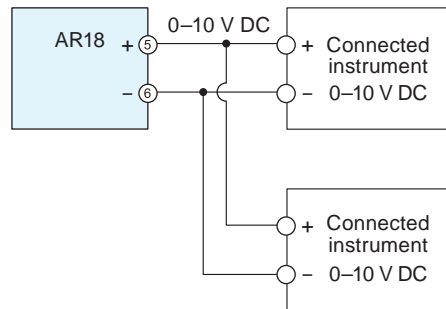


#### ■ Voltage output

\* If 1 load is connected



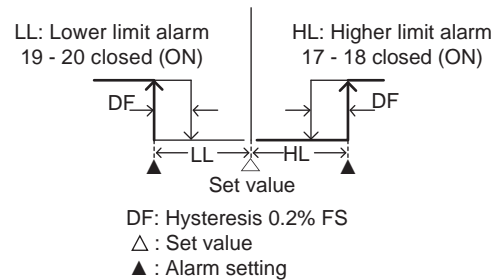
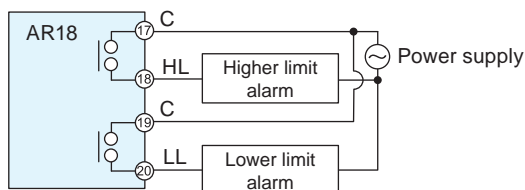
\* If 2 loads are connected



### ■ Alarm output circuit (optional)

Separate higher/lower limit setting/output is possible.

\* Higher/lower limit alarm wiring



## SPECIFICATIONS

## ■ Display

- Digital display : Measured value / red LED 4 digits,  
character height approx. 14.3 mm  
Setting 1, 2 / green LED 4 digits,  
character height approx. 8 mm  
Other (higher limit, lower limit alarm, hysteresis 1, 2, dead band (DB) / orange LED 2 digits,  
character height approx. 8 mm
- Status display : Output 1, 2 / green  
For three-position type, green/red 2-color lamp, dead band (DB) off
- Display accuracy : higher limit, lower limit alarm / red  
:  $\pm (0.25\%FS + 1 \text{ digit})$   
Does not include cold junction temperature compensation accuracy of thermocouple input  
For details on accuracy, see "8. Measuring Range Codes."
- Range for maintaining :  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$  (18–28°C)  
display accuracy
- Display resolution : Differs according to measuring range (0.1, 1)
- Measured value : -10 110% of measuring range  
display rangeHowever, Pt -200–600°C range is -240–680°C.  
JPt -200 500°C range is -240–570°C.
- Display update cycle : 0.25 seconds
- Input scaling : 0–100.0 (linear input) standard

## ■ Setting

- Setting method : By operation of 4 or 8 front keys (▼ ▲)
- Setting range : Same as measuring range

## ■ Input

- Input type : Selection by measuring range code (TC, Pt, mV, V, mA): B, R, S, K, E, J, T, N, PLII,  
C(WRe5-26), L(DIN43710), U(DIN43710) , Metal-chromel (AuFe-Cr)
- Thermocouple : Min. input resistance 500k $\Omega$   
: Max. external resistance tolerance: 100 $\Omega$   
: Burnout function: Standard equipment (up scale)  
: Cold junction compensation accuracy (CJ error)  $\pm 2^{\circ}\text{C}$  (within ambient temperature 5–45°C)  
: Pt100/JPt100 3-wire type  
: Amperage 0.25 mA  
: Lead wire tolerable resistance 5 $\Omega$  max. per wire (resistance for all wires must be equal)
- R.T.D. : -10–10, 0–10, 0–20, 0–50, 10–50, 0–100 mV DC  
: -1–1, 0–1, 0–2, 0–5, 1–5, 0–10 V DC  
: Input resistance 500k $\Omega$  min.
- Voltage mV : 0–20, 4–20 mA DC  
V : Input resistance approx. 250 $\Omega$
- Current mA : 0.25 seconds
- Sampling cycle : No insulation between input and system; all others insulated
- Isolation

## ■ Control

- Control mode : One-setting, two-position type control, two-setting, two-position type control, three-position type control
- Control output type/rating : Contact / 1c 240 V AC, 5A (resistive load), 2A (inductive load)  
: SSR drive voltage / 12V $\pm$ 1.5 V DC (max. load current 30 mA)
- No. of control output points : Output 1  
: Output 2
- Hysteresis (DF) : Two-position type 0.1–9.9% FS  
: Three-position type 0.2% FS fixed
- Action dead band (DB) : 1–99% FS  
(three-position type)
- Control output characteristics : RA (reverse characteristics) only  
Relay output: Realized by NC terminal for cooling
- Isolation : Contact output insulated for all  
: No insulation between SSR drive voltage and analog output; all others insulated

### ■ Alarm output (optional)

- Number of output points : 2 (HL, LL)
- Type : HL higher limit alarm  
LL Lower limit alarm
- Setting range : Higher limit alarm Without decimal point 0–99, no  
With decimal point 0.0–99, no  
(Note that decimal points cannot be set for readings of 10 or higher.)  
Lower limit alarm Without decimal point no, -99–0  
With decimal point no, -99–0.0  
(Note that decimal points cannot be set for readings of -10 or lower.)
- Action : ON-OFF action
- Hysteresis : 0.2% FS fixed
- Standby action : Standby action / no standby action
- Output type/rating : Contact 1a / 240 V AC, 2A (resistive load)
- Output updating cycle : 0.25 seconds
- Isolation : Insulated for all
- Selection conditions : Cannot be selected for two-setting, two-position type

### ■ Analog output (optional)

- Number of output points : 1
- Output type : Measured value
- Output range : Same as measuring range (fixed)  
Specification for lower limit value/higher limit value within measuring range is possible (specify when ordering).
- Output specifications/rating : Current 4–20 mA DC / max. load resistance 300Ω  
Voltage 0–10 V DC / max. load current 2 mA  
Voltage 0–10 mV DC, output resistance 10Ω
- Output accuracy : ±0.3%FS (for display value)
- Output resolution : Approx. 0.008% (1/13,000)
- Output updating cycle : 0.25 seconds
- Isolation : No insulation with control output P

### ■ General specifications

- Data storage : Non-volatile memory (EEPROM)
- Operating environment conditions :
  - Temperature : -10–50°C
  - Humidity : 90%RH max. (no dew condensation)
  - Elevation : 2000 m above sea level or lower.
  - Over voltage : Category II
  - Pollution degree : 2 (IEC 60664)
- Storage temperature : -20–65°C
- Supply voltage : 100–240 V AC ± 10% 50/60 Hz
- Power consumption : Max. 14 VA for 100 – 240 V AC
- Input/noise removal ratio : Normal mode min. 50 dB (50/60 Hz)  
Common mode min. 130dB (50/60 Hz)
- Insulation resistance : Between power terminal and input/output terminal  
Min. 500 V DC, 20 MΩ  
Between input/output terminals and ground terminal  
500V DC, 20MΩ or above
- Dielectric strength : Between input/output terminals and power terminal  
2300 V AC, 1 minute  
Between input/output terminal and ground terminal  
2300 V AC, 1 minute
- Applicable standards Safety : RoHS directive supported
- Material of case : PPE resin (flame resistance UL94V-0)
- External dimensions : H96 x W96 x D120 mm (100 mm inside panel)
- Protective structure : Only front panel has dust-proof and dripproof structure equivalent to IP66.  
(Panel thickness :1.2–3.2mm)
- Mounting : Push-in panel (one-touch mount)
- Panel thickness : 1.0 – 4.0 mm
- Panel cutout : H92 x W92 mm
- Weight : Approx. 340 g



## FUNCTION

### ■ Hysteresis, dead band (DB)

ON/OFF control setting value for this series is set in advance. When temperature reaches the set value, control output becomes OFF.

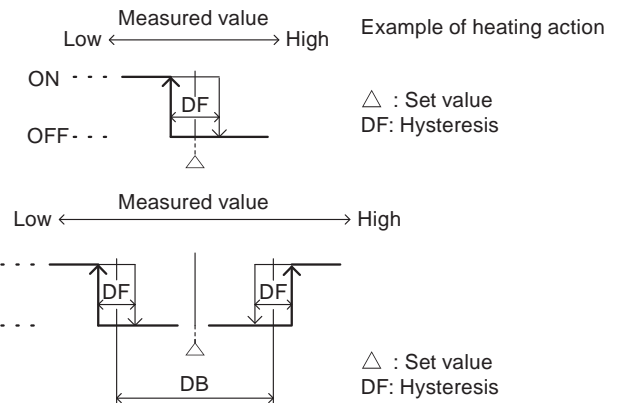
When output becomes OFF, temperature goes down, and then it becomes ON again. This action is repeated at a certain position. Hysteresis is provided for switching output ON/OFF to stabilize action.

### ■ Two-position type

With the two-position type, hysteresis (DF) is set to the desired value within the range of 0.1–9.9% FS.

### ■ Three-position type

Three-position includes dead band (DB) setting. The narrower dead band (DB) is, the less amplitude there is for heating and cooling and discrepancy with set point is reduced. It is therefore frequently used for heating and cooling. Set to the optimal value while observing action. Set dead band (DB) to the desired value within the range of 1–99% FS. Hysteresis (DF) is fixed to 0.2% FS.



### ■ Control output

\*Control output characteristics

In the case of contact output, connect either heating or cooling action as given in the following table.

Only heating is applicable in the case of SSR drive voltage output.

Two-position type		
Action	OUT1	OUT2
Heating	11-12	14-15
Cooling	11-13	14-16

Three-position type	
Action	OUT
Heating	11-12
Cooling	11-15

Heating: Terminal to be shorted if measured value is lower than set value.  
Cooling: Terminal to be shorted if measured value is higher than set value.

### ■ Alarm action

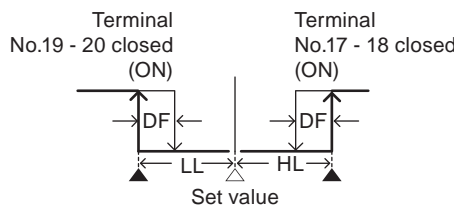
Sets alarm action points for deviation of measured values from target set values.

In the case of input measuring range code 005 (K, 0.0 – 800.0°C), for example, to trigger an alarm when measured value is 201.0°C or higher and the target set value (SV) is 200.0°C, the higher limit alarm is set to 1.0°C (unit).

Or to trigger an alarm when measured value is 198.0°C or less when target set value is 200.0°C, the lower limit alarm is set to 2.0°C (unit).

Alarm action point acts in accordance with target set values (SV).

If alarm action is ON, alarm value (orange) and action display (alarm higher limit and alarm lower limit) LED (red) lights.



△ : Set value

▲ : Alarm action point set value

Setting range: Higher limit value Without decimal point 0 – 99, no

With decimal point 0.0 – 99, no

(Note that decimal points cannot be set for readings of 10 or higher.)

(If “no” is selected, alarm action does not function.)

Lower limit value Without decimal point no, -99 – 0

With decimal point no, -99 – 0.0

(Note that decimal points cannot be set for readings of -10 or lower.)

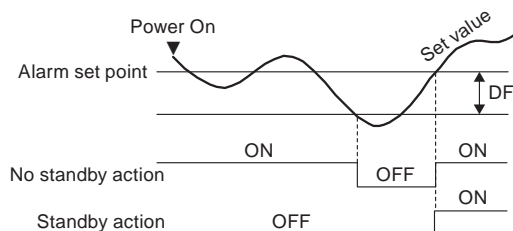
(If “no” is selected, alarm action does not function.)

DF: Hysteresis 0.2% FS fixed

## FUNCTION

## ■ Standby action

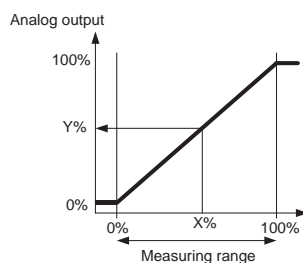
Standby action is a system whereby, when power is applied, if measured value is in the alarm range, the device stands by without giving the alarm, and once it gets out of the alarm range, the alarm is given when it enters the alarm range again. Operates by conventional operation after standby action is canceled.



## ■ Analog output

Analog output is a function output by converting measured output to DC current signal according to 0–100% of measuring range.

Types of analog output include current output 4–20 mA DC, voltage output 0–10 V DC or 0–10 mV DC.

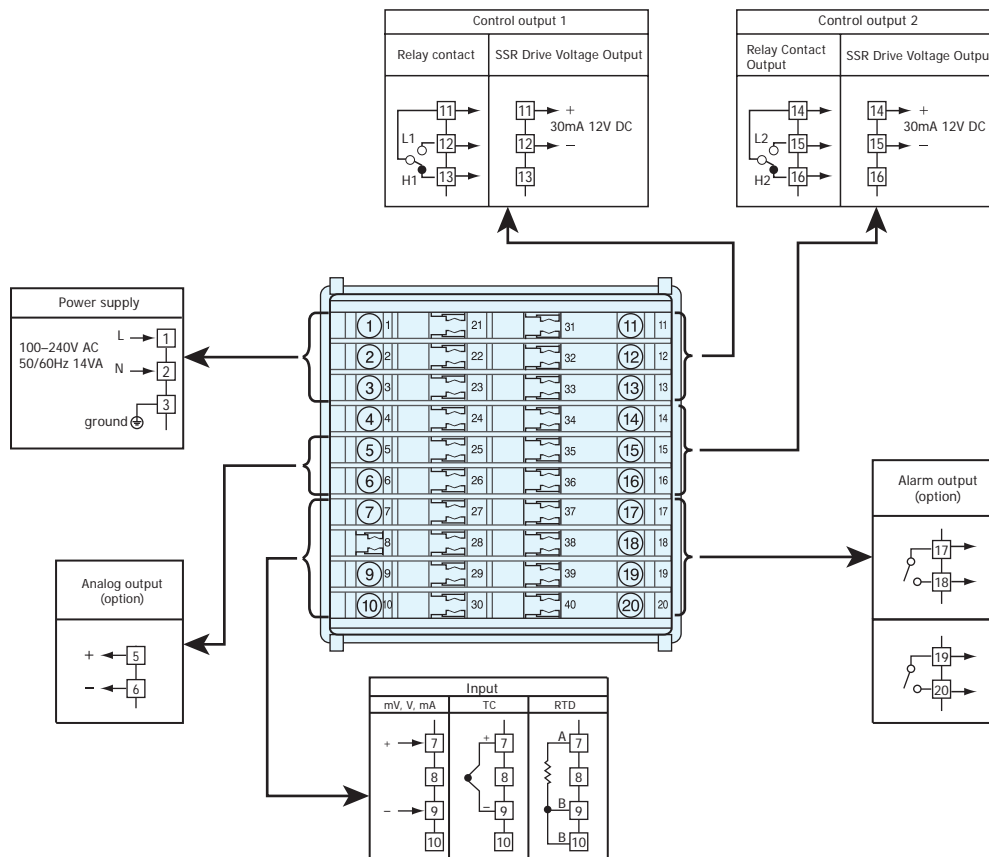


## TERMINAL ARRANGEMENT TABLE

Name of terminal	Description	Terminal No.	
		Two-position type	Three-position type
Power supply	100–240 V AC L	1	1
	100–240 V AC N	2	2
Input	Thermocouple/voltage/current: +	7	7
	Thermocouple/voltage/current: –	9	9
	R.T.D.: A	7	7
	R.T.D.: B	9	9
	R.T.D.: B	10	10
Control output 1	Contact: NO	11-12	
	Contact: NC	11-13	
	Contact: NO		11-12
	Contact: NO		11-15
	SSR drive voltage +	11	
	SSR drive voltage –	12	
Control output 2 (Two-setting type)	Contact: NO	14-15	
	Contact: NC	14-16	
	SSR drive voltage +	14	
Alarm output (optional)	SSR drive voltage –	15	
	Contact: C	17	17
	Contact: HL	18	18
	Contact: C	19	19
Analog output (optional)	Contact: LL	20	20
	Voltage/current: +	5	5
Protective conductor terminal	Voltage/current: –	6	6
	Ground terminal	3	3

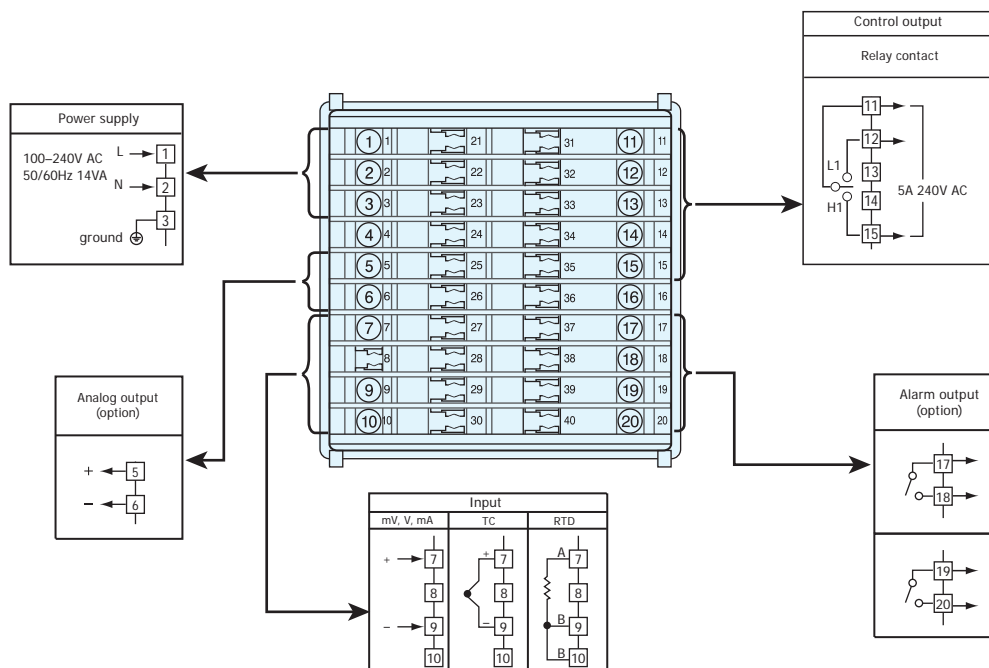
## TERMINALS DIMENSIONS

### Two-position type



Crimp-type terminals fit M3.5 screws.

### Three-position type



Crimp-type terminals fit M3.5 screws.

## ORDERING INFORMATION

Item	Code	Specifications		
Series	AR18 -	DIN 96 x 96 digital controller		
Measured values	1	Equipped with indicator (red) 4 digits Character size 14.3 mm		
	0	Not equipped with indicator		
Input	□□□	See Measuring Range Codes.		
Control mode	1	One setting, two-position type DF: 0.1 – 9.9% FS		
	2	Two setting, two-position type DF: 0.1 – 9.9% FS (alarm output cannot be selected)		
	3	Three-position type DF: 0.2% FS DB: 1 – 99% FS		
Control output 1 To select three-position, select “Y.”	Y -	Contact 1c 240 V AC 5A / resistive load 2A / inductive load		
	P -	SSR drive voltage output / 12 V±1.5 V DC (max. load current 30 mA)*		
Control output 2 To select one-setting, two-position type, select “N.” To select two-setting, two-position type, select “Y” or “P.” To select three-position type, select “N.”	N	Not equipped		
	Y	Contact 1c 240 V AC 5A / resistive load 2A / inductive load		
	P	SSR drive voltage output / 12 V±1.5 V DC (max. load current 30 mA)*		
Alarm output To select two-setting, two-position type, select “0.”	0	Not equipped		Hysteresis: 0.2% FS fixed Setting range: 0 – 99 unit, no
	1	Higher and lower limit deviation 2 points, no standby action Contact 1a 240 V AC 2A / resistive load		
	2	Higher and lower limit deviation 2 points, standby action Contact 1a 240 V AC 2A / resistive load		
Analog output	0	None		PV allocation fixed
	3	Voltage 0 – 10 mV DC, output resistance 10Ω		
	4	Current 4 – 20 mA DC, load resistance 300Ω max.		
	6	Voltage 0 – 10 V DC, load current 2 mA max.		
Front panel	J	Japanese		
Remarks	0	Without		
	9	With		

\* Supplementary explanation: The table below indicates the summary of the specifications of

“4. Control mode,” “5. Control output 1” and “6. Control output 2” which are shown on the above table.

Item	Code	Specifications
4. Control mode 5. Control output 1 6. Control output 2	1Y-N	One-setting, two-position type DF: 0.1–9.9%FS (contact output)
	1P-N	One-setting, two-position type DF: 0.1–9.9%FS (SSR drive voltage output)
	2Y-Y	Two-setting, two-position type DF: 0.1–9.9%FS (contact output + contact output)
	2Y-P	Two-setting, two-position type DF: 0.1–9.9%FS (contact output + SSR drive voltage output)
	2P-Y	Two-setting, two-position type DF: 0.1–9.9%FS (SSR drive voltage output + contact output)
	2P-P	Two-setting, two-position type DF: 0.1–9.9%FS (SSR drive voltage output + SSR drive voltage output)
	3Y-N	Three-position type DF: 0.2%FS DB: 1–99%FS (contact output)

\*1: For SSR drive voltage output, “heating action only.”

\*2: Specification for lower limit value/higher limit value within measuring range is possible (specify when ordering).

### ■ Terminal cover (Sold separately)

Type	Mounting method
For AR18	QCR003 One-touch mount (1 set contains 2 covers)

## MEASURING RANGE CODES

Input type			Code	Measuring range		Code	Measuring range		Higher/lower limit alarm setting range
Thermocouple	B		001 *1	0 – 1800 °C		101 *1	0 – 3300 °F		Higher limit alarm Without decimal point: 0 – 99, no With decimal point: 0.0 – 99, no (Note that decimal points cannot be set for readings of 10 or higher.)  Lower limit alarm Without decimal point: no, -99 – 0 With decimal point: no, -99 – 0.0 (Note that decimal points cannot be set for readings of -10 or lower.)
	R		002	0 – 1700 °C		102	0 – 3100 °F		
	S		003	0 – 1700 °C		103	0 – 3100 °F		
	K		004 *2	–199.9 – 400.0 °C		104 *2	–300 – 750 °F		
			005	0.0 – 800.0 °C		105	0 – 150 °F		
			006	0 – 1200 °C		106	0 – 2200 °F		
	E		007	0 – 700 °C		107	0 – 1300 °F		
	J		008	0 – 600 °C		108	0 – 1100 °F		
	T		009 *2	–199.9 – 200.0 °C		109 *2	–300 – 400 °F		
	N		010	0 – 1300 °C		110	0 – 2300 °F		
	PLII *3		011	0 – 1300 °C		111	0 – 2300 °F		
	C (WRe 5-26)		012	0 – 2300 °C		112	0 – 4200 °F		
	U *4		013 *2	–199.9 – 200.0 °C		113 *2	–300 – 400 °F		
	L *4		014	0 – 600 °C		114	0 – 1100 °F		
Kelvin	K	015 *5	10.0 – 350.0 K						
	AuFe-Cr	016 *6	0.0 – 350.0 K						
	K	017 *5	10 – 350 K						
	AuFe-Cr	018 *6	0 – 350 K						
R.T.D.	Pt100		030	–100.0 – 350.0 °C		130	–150.0 – 650.0 °F		
			031	–200 – 600 °C		131	–300 – 1100 °F		
			032	–100.0 – 100.0 °C		132	–150.0 – 200.0 °F		
			033	–50.0 – 50.0 °C		133	–50.0 – 120.0 °F		
	JPt100		034	0.0 – 200.0 °C		134	0.0 – 400.0 °F		
			035	–200 – 500 °C		135	–300 – 1000 °F		
			036	–100.0 – 100.0 °C		136	–150.0 – 200.0 °F		
			037	–50.0 – 50.0 °C		137	–50.0 – 120.0 °F		
	Pt100		038	0.0 – 200.0 °C		138	0.0 – 400.0 °F		
			039	–100.0 – 350.0 °C		139	–150.0 – 650.0 °F		
			040	–199.9 – 550.0 °C		140	–300 – 1000 °F		
			041	0.0 – 350.0 °C		141	0.0 – 650.0 °F		
	JPt100		042	0.0 – 550.0 °C		142	0 – 1000 °F		
			045	–199.9 – 500.0 °C		145	–300 – 1000 °F		
			046	0.0 – 350.0 °C		146	0.0 – 650.0 °F		
			047	0.0 – 500.0 °C		147	0 – 1000 °F		
Voltage (mV)	–10 – 10mV		071	0.0–100.0 (fixed) * 7					
	0 – 10mV		072						
	0 – 20mV		073						
	0 – 50mV		074						
	10 – 50mV		075						
	0 – 100mV		076						
Voltage (V)	–1 – 1V		081						
	0 – 1V		082						
	0 – 2V		083						
	0 – 5V		084						
	1 – 5V		085						
	0 – 10V		086						
Current (mA)	0 – 20mA		091						
	4 – 20mA		092						

Thermocouple B, R, S, K, E, J, T, N: JIS/IEC

R.T.D. Pt100: JIS/IEC JPt100

\*1. Thermocouple B: Accuracy guarantee not applicable to 400°C (752°F) and/or below.

\*2. Thermocouple K, T, U: Accuracy of those readings -100.0°C and/or below is  $\pm 0.7\%$  FS.

\*3. Thermocouple PLII: Platinel

\*4. Thermocouple U, L: DIN 43710

\*5. Thermocouple K (Kelvin) accuracy

Temperature range	
Below 30.0K	$\pm(2.0\%FS + 40K + 1 \text{ digit})$
30.0K or more-Below 70.0K	$\pm(1.0\%FS + 14K + 1 \text{ digit})$
70.0K or more-Below 170.0K	$\pm(0.7\%FS + 6K + 1 \text{ digit})$
170.0K or more-Below 270.0K	$\pm(0.5\%FS + 3K + 1 \text{ digit})$
270.0K or more	$\pm(0.3\%FS + 2K + 1 \text{ digit})$

\*6. Thermocouple Metal-chromel (AuFe-Cr) (Kelvin) accuracy

Temperature range	
Below 30.0K	$\pm(0.7\%FS + 6K + 1 \text{ digit})$
30.0K or more-Below 70.0K	$\pm(0.5\%FS + 3K + 1 \text{ digit})$
70.0K or more-Below 170.0K	$\pm(0.3\%FS + 2.4K + 1 \text{ digit})$
170.0K or more-Below 280.0K	$\pm(0.3\%FS + 2K + 1 \text{ digit})$
280.0K or more	$\pm(0.5\%FS + 2K + 1 \text{ digit})$

**Note: Measuring range is set to one of those given above as specified by the customer.**

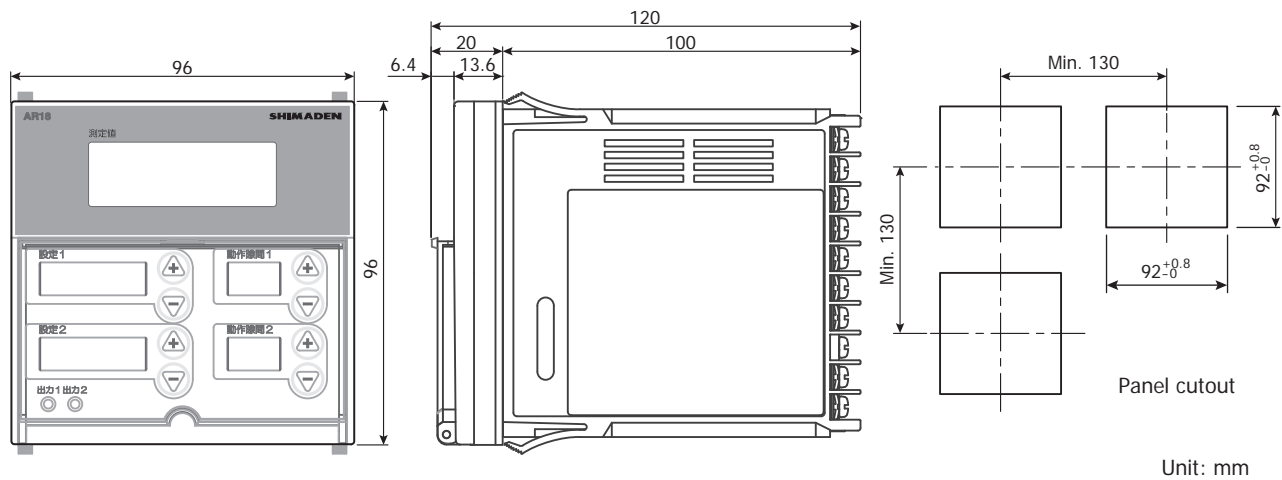
\* 7 For an exception from the standard option, please select the remark 9.

Specification is possible under the following conditions (specify when ordering).

Range : -1999-9999 digit Lower limit value < higher limit value

Span : 10-10000 digit

Position of decimal point : none, 0.1

**EXTERNAL DIMENSIONS/PANEL CUTOUT**

■ The contents of this material are subject to change without notice.



- \* Be sure to follow the instruction manual when operating this device.
- \* This device is designed for industrial use to control temperature, humidity and other physical values. Avoid using it for control of devices upon which human life is dependent.
- \* If the possibility of loss or damage to your system or property as a result of failure of any parts 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.

Head Office & Saitama Factory  
ISO 9001/ISO14001 Certification Obtained

Temperature and Humidity Control Specialists  
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