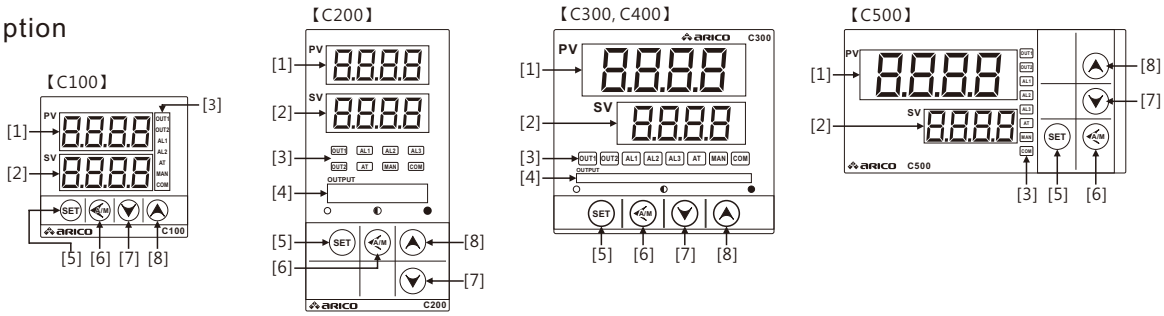


## Panel Description



- [1]. PV(process variable):display function table in setting temperature/setting mode
- [2]. SV(set value):display parameter value in setting temperature/setting mode
- [3]. Status indicator:OUT1/OUT2(green)=control output, AL1~AL3(red)=alert 1~3, AT(yellow)=Auto-Tuning, MAN(yellow)=manual mode, COM(yellow)=communication
- [4]. Percentage light bar of OUT1
- [5]. [SET] Start/End parameter setting
- [6]. [<] Auto/Manual switching key, shift the cursor in setting mode
- [7]. [v] Decreases parameter value in setting mode
- [8]. [^] Increases parameter value in setting mode

## Model Number Description

**C100** - **1** **0** **1** **0** - **0** **0** **0** **0** **A**

Model	Control Output 1	Control Output 2	ALM	Input Type	Remote SV	Transmit Output	Communication	Power
C100	0 none	0 none	0 none	0 TC/Pt100	0 none	Control Input	0 none	A AC90~240V
C200	1 RELAY	1 RELAY	1 1	-	-	0 none	1 RS232	D DC24V
C300	2 Logic Voltage SSR	2 Logic Voltage SSR	2 2	3 4~20mA	3 4~20mA	1 1CTL input	2 RS485	
C400	3 4~20mA	3 4~20mA	3 3	4 0~5V	4 0~5V	2 2CTL input		
C500	4 0~5V	4 0~5V	A HBA(50A)	5 1~5V	5 1~5V	3 4~20mA		
PC100	5 1~5V	5 1~5V	B HBA+AL2	6 0~10V	6 0~10V	4 0~5V		
PC200	6 0~10V	6 0~10V	C HBA+AL2,3	7 2~10V	7 2~10V	5 1~5V		
PC300	7 2~10V	7 2~10V	D HBA(100A)	8 4~20mA(aux24v)		6 0~10V		
PC400	8 Proportional value control		E HBA+AL2	9 0~10V(aux24V)		7 2~10V		
PC500			F HBA+AL2,3					

## Input List

Input	CODE	Measurement Range	CODE	Measurement Range
THERMOCOUPLE	K1	-99.9~200.0°C/-99.9~392.0°F	K2	-99.9~400.0°C/-99.9~752.0°F
	K3	-99~600°C/-99~1112°F	K4	-99~800°C/-99~1472°F
	K5	-99~1000°C/-99~1832°F	K6	-99~1200°C/-99~2192°F
	J1	-99.9~200.0°C/-99.9~392.0°F	J2	-99.9~400.0°C/-99.9~752.0°F
	J3	-99~600°C/-99~1112°F	J4	-99~800°C/-99~1472°F
	J5	-99~1000°C/-99~1832°F	B1	0~1820°C/0~3308°F
	R1	0~1700°C/0~3092°F	S1	0~1700°C/0~3092°F
	E1	0~800°C/0~1472°F	N1	0~1300°C/0~2372°F
	T1	-99.9~200.0°C/-99.9~392.0°F	T2	-99.9~400.0°C/-99.9~752.0°F
	W3	0~2300°C/0~4172°F	W5	0~2000°C/0~3632°F
PL2	0~1390°C/0~2534°F			
PLATINUM RESISTANCE	PT1	-199.9~200.0°C/-199.9~392.0°F	PT2	-199.9~400.0°C/-199.9~752.0°F
	PT3	-199.9~600.0°C/-199.9~1112.0°F	PT4	0~200°C/0~392°F
	PT5	0~400°C/0~752°F	PT6	0~600°C/0~1112°F
	JP1	-199.9~200.0°C/-199.9~392.0°F	JP2	-199.9~400.0°C/-199.9~752.0°F
	JP3	-199.9~600.0°C/-199.9~1112.0°F	JP4	0~200°C/0~392°F
	JP5	0~400°C/0~752°F	JP6	0~600°C/0~1112°F
ANALOG	An10	-1999~9999/10mV	An20	-1999~9999/20mV
	An50	-1999~9999/50mV	USER	-1999~9999/(20mA,5V,10V)

## Specifications

Model	C100	C200	C300	C400	C500
Dimension(mm)	48X48	48X96(S)	72X72	96X96	96X48(H)
Power Supply	AC90~240V(60/50Hz),DC24V(optional)				
Power Consumption (approx)	4	4	5	5	4
N.W(approx)	130	200	200	280	200
Storage/Operating Environment	0~65°C/0~50°C, 20~90%RH				
Data Backup Memory	EEPROM,10 years				
Accuracy	0.3%FS				
Display Height (mm) PV(red)/SV(green)	10/10	11/11	14/11	14/11	14/10
ALM Output	Relay contact 8A,250VAC				
Control Output	Relay contact 8A,250VAC Logic Voltage (drive SSR):ON=24V (20mA max.) Analog Current:4~20mA(input resistance 600Ω max.) Analog Voltage:0~10V(input resistance 1KΩ min.)				
Control Input CTL1,2	NPN input, input resistance 4.7KΩ				
Input Type	Thermocouple, RTD, Analog Voltage Current (see input list)				

## Abnormal display

- oPE: sensor input terminal disconnected
- oL,-oL: input overloaded
- CJER: cooling/heating compensation error
- AdEr: interior circuit error

## Parameter settings

The interior parameter of controller can be divided into 4 groups according to their properties (LEVEL1~LEVEL4). Setting authority by LOCK parameter limit group. Go in parameter group, press [<] to start set up the parameter(value blinking); press [SET] to finish change, and jump next parameter; press [SET] for 1 second to end setting.

## Auto/Manual switching key

Press **AM** for 1.5 second to switching Auto/Manual. Go in Manual mode, MAN indicator is on, OUT1/OUT2 none output, the upper row display PV, the lower row display "OFF", re-press **AM**, can auto adjust OUT1 to 0.1~100.0% or OUT2 to 0.1~100%.

●[LEVEL1] Parameter setting, press [SET] to start

Parameter	Description	Default
AL 1	[AL 1] alert 1 setting Range: -1999~9999	0
i 00	[i (current value), ALM1 disconnection detector (select HBA) set current value. Upper row display present current value, lower row display setting range: 0.0~99.9A	0.0A
AL 2	[AL 2] alert 2 setting. Range: -1999~9999	0
AL 3	[AL 3] alert 3 setting. Range: -1999~9999	0
AL	[AT] Auto-Tuning PID. Range: NO, Yes	No

●[LEVEL2] Parameter setting, press [SET] for 1 sec. to start

P 1	[P1] OUT1 Proportion setting Range: 0~2000/0.0~200.0(°C, °F)=0, on-off control	6°
i	[I] Integral time. Range: 0~3600 sec.	240sec.
d	[d] Differential time. Range: 0~900 sec.	60sec.
CYC 1	[CYC 1] OUT1 cycle time. Range: 0~120 sec.	10sec.
CY t	[CY t] 3 lines proportional valve itinerary time (optional).	5sec.
P 2	[P2] OUT2 Proportional valve setting (optional) Range: 0~2000/0.0~200.0(°C, °F)=0, on-off control	60°
CYC 2	[CYC 2]OUT2 cycle time (optional). Range: 0~120 sec.	10sec.
dbnd	[dbnd] Set up none output band of OUT2 ( optional). Range: -199~999	0
ATSV	[ATsv] SV offset in Auto-Tuning. Range: 0~999	0
HYS	[HYS] On-OFF control (PI=0), OUT1 hysteresis Range: 0~999	2
o 1Lo	[o1Lo] OUT1 low output setting. Range: 0.0~100.0%	0%
o 1H	[o1Hi] OUT1 high output setting. Range: 0.0~100.0%	100.0%
o 2Lo	[o2Lo] OUT2 low output setting. Range: 0.0~100.0%	0%
o 2H	[o2Hi] OUT2 high output setting. Range: 0.0~100.0%	100.0%
ARW	[ARW] Integration stop prevent setting. Minimize the integration area to reduce overshoot. Range:10.0~100.0%	100.0%
rAnP	[Ramp] Slow ramp rate setting Range: 0~60.00(°/min. ). None ramp-up effect if set to 0.	0
Pwon	[Pw.on] Enter auto mode after booting Auto=PID auto control. Man=Manual mode	Auto

●[LEVEL3] Parameter setting, press [SET]+[V] for 1 sec. to start

inty	[inty] Input type. Range: K1~user. (see input type table)	K3
Pnt	[Pnt] Decimal point setting (analog input). Range: 0~3	0
in 1L	[In1L] Analog input low point correction. (press ◀ key to read signal) Range: -1999~9999	0
PuLo	[PvLo] PV low point display setting. Range: -1999~9999	0
in 1H	[InHi] Analog input high point correction (press ◀ key to read the signal. Range: -1999~9999	1000
PuH	[PvHi] PV high point display setting. Range: -1999~9999	1000
PuCn	[Pv.Cm] PV offset compensation. Range: -999~999	0
PuCO	[Pv.CO] PV ramp compensation start setting. Range: based on input type range	0
P.rAt	[P.Rat] PV ramp compensation setting. Range: 0.100~4.000	1.000
A1Fu	[A1Fu] ALM1 operation function code selection. Range: 0~60 (refer to alert output)	02
A1Tr	[A1Tr] ALM1 output time setting Range: -1999~9999(sec./min.). Refer to alert output.	0
A1Tu	[A1Tu] ALM1 output time unit setting Range: sec./min.	sec
A1Fn	[A1Fm] ALM1 output contacts status convert Range: NO, NC	NO
A1Lo	[A1Lo] ALM1 hysteresis width setting Range: 0~9999 (refer to alert output)	0
If select multistage ALM modes, also have A2Fu~A3Lo list, function same as above, ignore here		
Su L	[Sv L] SV can set the lowest point limit range Range: based on input spec.	0
Su H	[Sv H] SV can set the highest point limit range Range: based on input spec.	600
in2L	[In2L] Analog RSV input low point correction (press ◀ key to read the signal). Range: -1999~9999	0
rSuL	[RSVL] RSV low point display setting. Range:-1999~9999	0
in2H	[In2H] RSV analog input high point correction (press ◀ key to read the signal). Range: -1999~9999	1000
rSuH	[RSV] RSV high point display setting. Range:-1999~9999	1000
Co 1L	[Co1L] OUT1 analog output low point correction Range: 2~9999	6900
Co 1H	[Co1L] OUT1 analog output high point correction Range: 2~9999	4000

[LEVEL3] Parameter setting

Parameter	Description	Default
Co2L	[Co1L] OUT2 analog output low point correction Range: 2~9999	6900
Co2H	[Co1L] OUT2 analog output high point correction Range: 2~9999	4000
o3Ly	[O3ty] OUT3 analog transmission target selection (optional) Range: PV,SV,OUT1,OUT2	PV
Co3L	[Co3L] OUT3 analog output low point correction Range: 0~9999	6100
Co3H	[Co3H]OUT3 analog output high point correction Range: 0~4000	1400
o3 L	[o3 L] Correspond low point display setting Range: -1999~9999	0
o3 H	[o3 H] Correspond high point display setting Range: -1999~9999	1000
Unit	[Unit] Unit switching setting. Range: C, F	C
dir	[dir] Temp. control direction. Range: Heat, Cool	Heat
FILr	[Filr] Digital filter strength setting, The PV more stable, the number larger, but might affect control correspond. Range: 0.00~9.90	2.00
id	[id] Communication station. Range: 1~99	1
baud	[baud] Baud rate. Range: 2.4, 9.6, 19.2, 38.4(Kb/s)	9.6
data	[data] Communication format. Range: 8n1,8n2,8o1,8e1	8n1
mode	[Mode] ModBus data format. Range: rtu,ascii	rtu
tout	[tout] Communication disconnected, timing out (see comm. spec.) Range: 5~99 sec.	10sec.

●[LEVEL4] Parameter setting, press [SET]+[^] for 1 sec. to start

LoCP	[Lock] Parameter group lock Range: 0=LEVEL1~LEVEL3 cannot set 1=only SV can set 2=LEVEL1 is open 3=LEVEL1~2 is open 4=all open	4
Pr.Sv	[Pr. Sv] Pre-heat SV after booting. Range: based on input range	0
Pr.Ho	[Pr.Ho] OUT1 pre-heat fixed output amount. Range: 0~100.0%. Set 0 to cancel pre-heat function	0%
SL.Sv	[SL.Sv] Select other group SV as working SV. Range: 1~4	1
init	[init] Restore factory defaults. Range: No, Yes	no
CTL 1	[CTL1] Control input 1 action function setting. Ex. null=none action rest=alert reset SELT=specify selection SV skip=jump to the next SV Lock=panel invalid strt=Manual/Auto mode Hold=Ramp hold *The Input signal of "Hold, Lock, rest, SLSV" are level hold, the rest are trigger-start function	null
CTL 2	[CTL2] Control input 2 action function setting. Range: as above. Note: do not repeat the function of "lock, rest, hold", otherwise, they will be invalid	null

■SV1~SV4 Setting/Selection

The controller has 4 groups SV (SV1~SV4). If need change the current SVx value, directly press ◀ key to start; then press [ ^ ] [ V ] key to change the value, press [SET] to end.

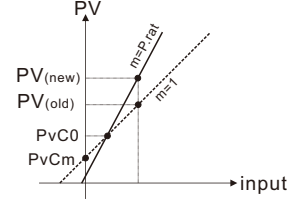
If want to select other group' SV, persistent press [ V ] key, SV will increase each 1 sec., release [ > ] key to select or change the value (1~4) of parameter SL.SV.

If external CTLx set as SELT function (specify select SV), cannot use keys to operate and select. CTL2 & CTL1 are set to SELT, by 2 input status (0=OFF, 1=ON) combined into binary value to specify select SV: 00=SV1, 01=SV2, 10=SV3, 11=SV4

If any of CTLx is set to select, only can choose SV1(0) or SV2(1) SV1~SV4 set value can be set at Level 1 parameter (after AT parameter).

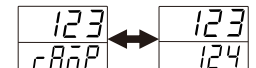
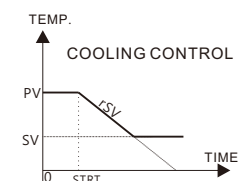
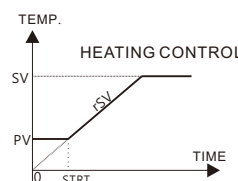
■PV Error Compensation

LEVEL 3 parameter PvCO, Part compensate PV display error calculation formula  
 $PV(new) = Part * (PV(old) - PvCm - PvCO) + PvCO$   
 Ex. At room temp., actual temp. is 28°, but controller display 30°. Set PvCm=-2(°) compensation, when heating, the actual temp. of the high temp. is 210°, but controller display 200°?  
 1. Set PvCO=28  
 2. Calculate P.rat ramp=(210-28)/(200-28)=1.058



■Ramp Heating

Set parameter Ramp>0 to perform ramp temp. control, ramp setting (°/min.). When enter auto mode, set value (rSV) will start from PV, based on ramp to calculate (°/min.) and increase rSV value till rSV=SVx (remarks: SVx=one of SV1~SV4) If change SV value, only let PV<SV (cooling control PV>SV) auto perform Ramp



The display window of Ramp executing. Every 1 sec. change Ramp/Rsv value

## Alert Output Function

61 types of alert output. 00=Holding temperature alarm function, odd numbers represents that the 1st output after start up is disabled.

NO.	Comparison of relative deviation	Comparison of relative deviation	Comparison of absolute deviation
01			
02	ON OFF interm 31 32	11 12 interm 41 42	21 22 interm 51 52
03	ON OFF interm 33 34	13 14 interm 43 44	23 24 interm 53 54
05	ON OFF interm 35 36	15 16 interm 45 46	25 26 interm 55 56
07	ON OFF interm 37 38	17 18 interm 47 48	27 28 interm 57 58
09	ON OFF interm 39 40	19 20 interm 49 50	29 30 interm 59 60

### Alert Output Time Setting

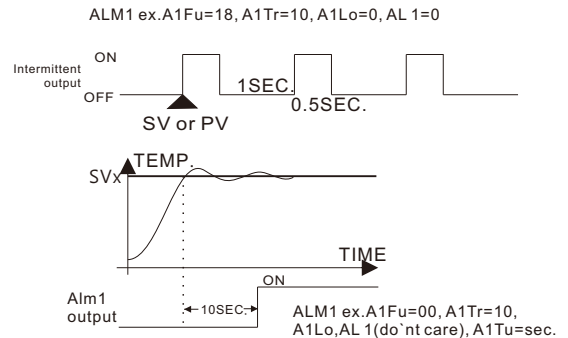
Parameter A1Tr~A3Tr control the alert output time separately. When output condition is established, start time delay. Positive and negative time, different function output.

1. Set negative value, example-9, represent "ON" condition established, the alert after delay 9 sec.
2. Set 0 sec., represent "ON" condition established, the alert immediate action.
3. Set positive value time, example 10, represent "OFF" condition established, the alert change from "On" to "Off" after 10 sec.
4. Set 9999 sec., represent "ON" condition established, the alert self-hold, must use switching Manual mode, reset signal or resend power to lift.

### Alarm Intermittent Output Function (Flash out)

Parameter A1Fu, A3Fu function code setting 31~60, alert output intermittent continuously output.

By the alert time control on-of. (0x) digit in tens is "off" time, (x0) digit in ones is "on" time. Range can be set 0~9 sec. 0=0.5 sec.



### Function Code 00 (Holding Temperature Alert)

Parameter AxFu (A1Fu, A2Fu, A3Fu) function code set to 0, when PV=SVx, start timing. (AxTr set delay time) whatever PV value changes, when time is up, alert output and hold. Switch Manual mode, reset signal or resend power to lift.

### Pre-Heating

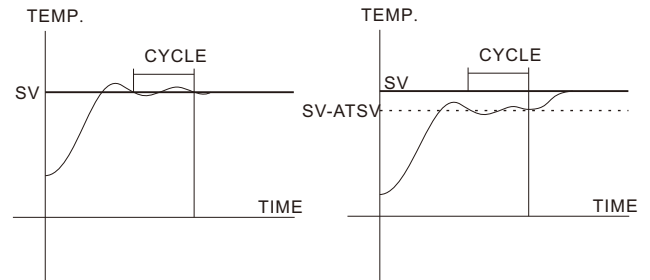
When booting, if PV<Pr.Sv value, OUT1 regular output (by Pr.Ho parameter setting). Alert none action. Until PV≥Pr.Sv, enter auto mode (pid temp. control mode). Or in Manual mode, any of below conditions is established, none pre-heat function.

1. Pr.Ho=0
2. Manual mode
3. Auto-Tuning PID (AT)
4. Any abnormal occurrence
5. Dir=Cool

### PID (Auto-Tuning)

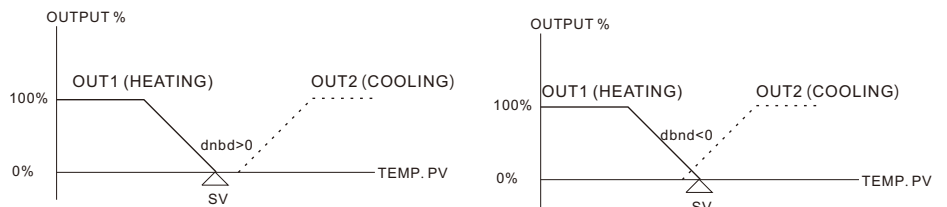
Auto-Tuning uses Relay ON-OFF to detect the dynamic characteristics of the controlled substance During the Auto-Tuning, must KEEP the controlled substance to be executed under not to be interfered status. When Auto-Tuning is completed (AT indicator off), the parameter of P.I.D. will auto update. When one of below situation happened, Auto-Tuning will stop and enter Manual mode, but won't change PID value.

- Any of abnormal (including power outages)
  - The half cycle time of controlled substance is over 2 hours
  - Forced to entering Manual mode
- In accordance to the data, to calculate the best P.I.D. parameter combination.

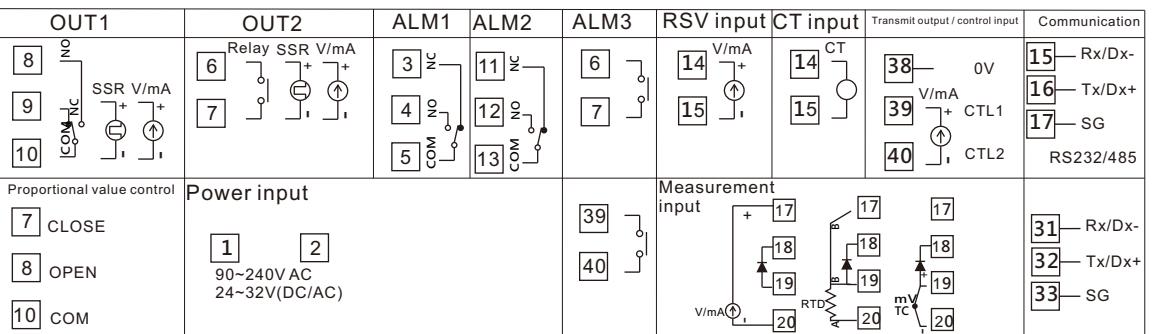
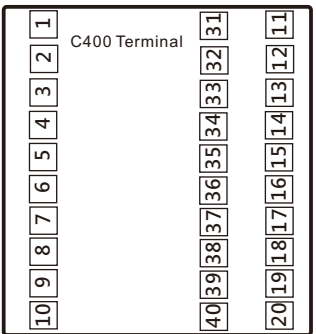
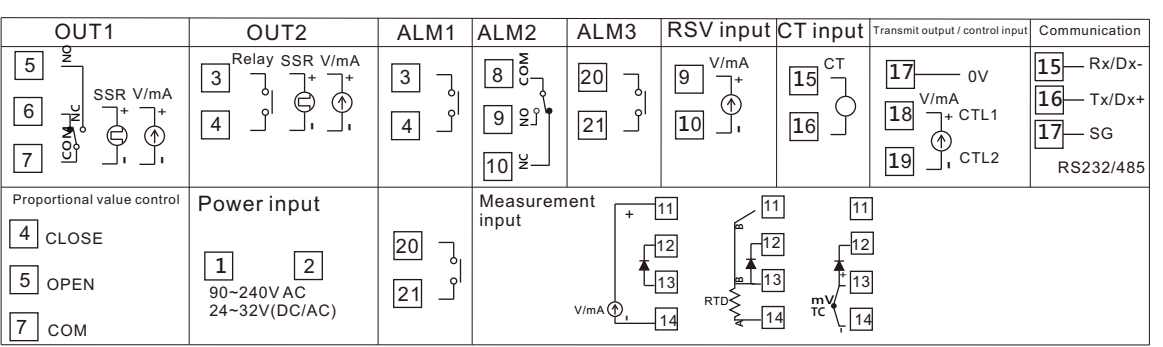
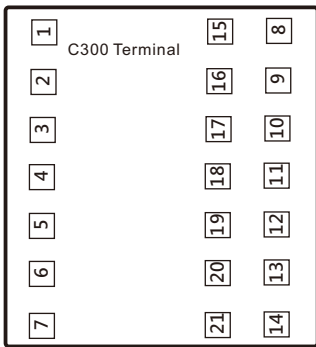
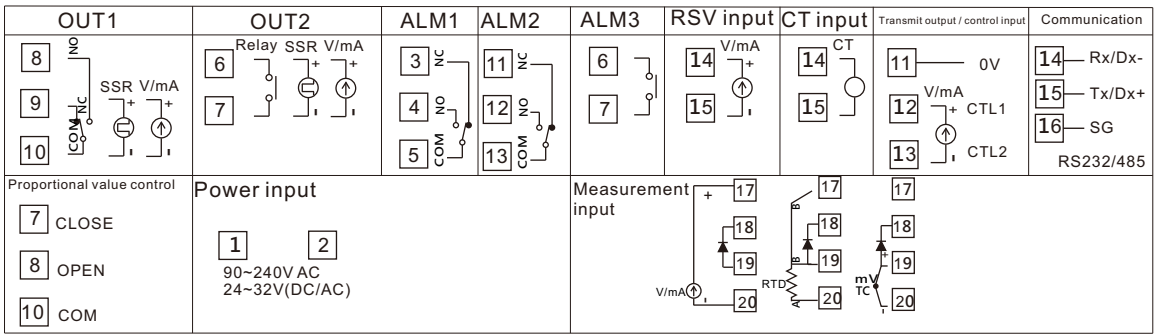
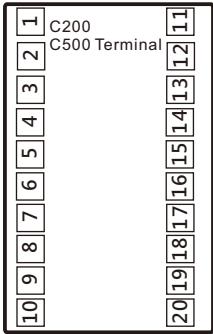
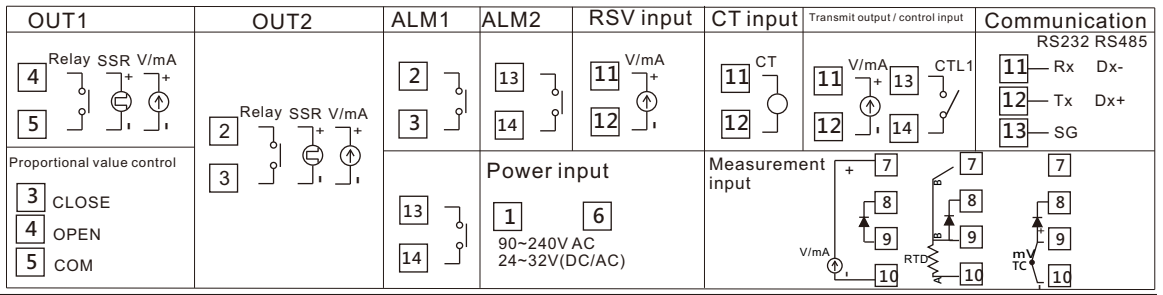
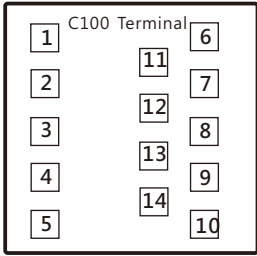


### Heat/Cool Control (optional)

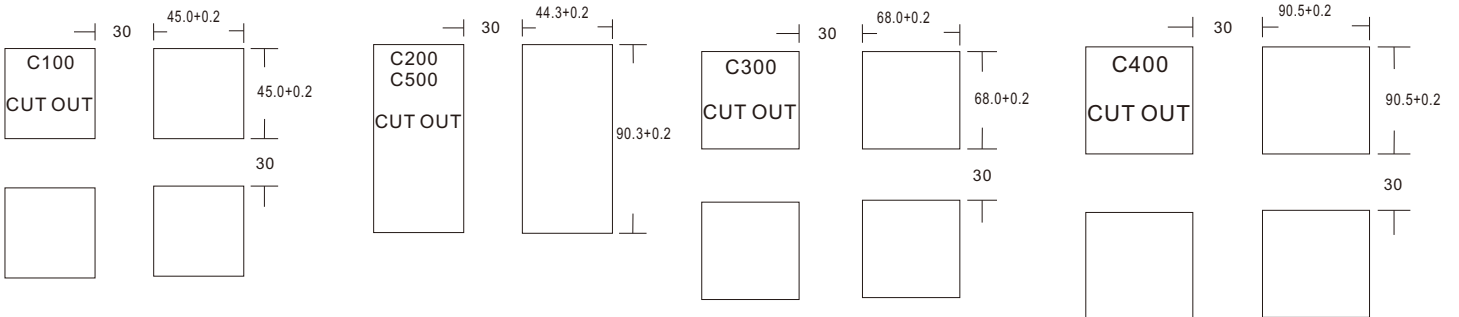
OUT1(heating) & OUT2(cooling) can set up gap or overlap by parameter "dbnd".



■ Wiring diagram (If pin is connected repeat, can only select one function)



■ Cut-out & Mounting (unit:mm)



Two methods to fixed the controller.  
 1. First, mount the controller to the cut panel, then inserts the fixed rack to the side gaps of the controller. Last, push forward till fixed (see figure mount 1). (Or rotate the screw to reach the panel, and then use the screwdriver to tighten it.)  
 2. Or push back the fixing rack, then use a screwdriver to lock forward and tighten it (see figure mount 2)

MOUNT 1

MOUNT 2

