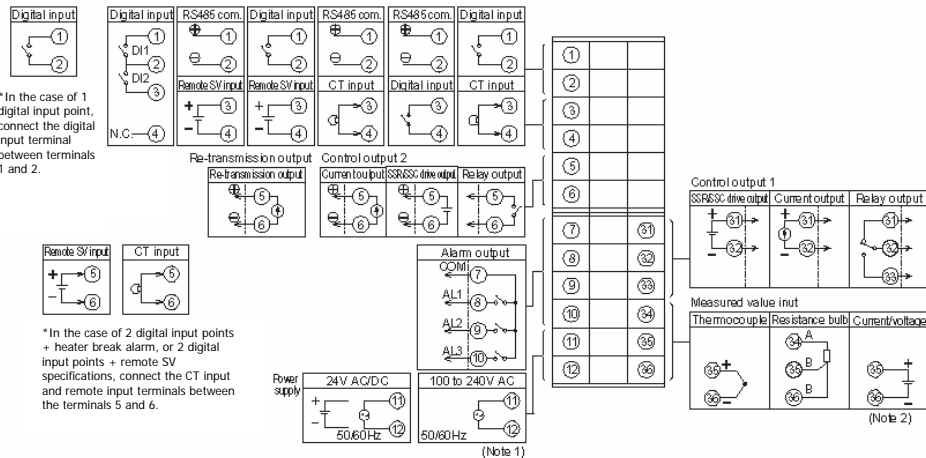


Wiring

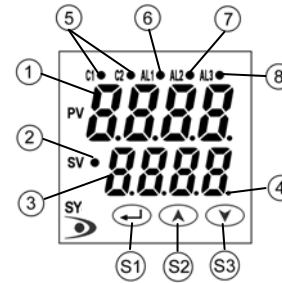


*In the case of 1 digital input point, connect the digital input terminal between terminals 1 and 2.

*In the case of 2 digital input points + heater break alarm, or 2 digital input points + remote SV specifications, connect the CT input and remote input terminals between the terminals 5 and 6.

Note 1 : Check the power supply voltage before installation.
 Note 2 : Connect the I/V unit (250Ω resistor) (accessory) between the terminal ⑳ and ㉑ in case of current input.

Name of Functional Parts and Functions



Name	Function
S1	Select key The key shifting to the 1st, the 2nd or the 3rd block parameter, switching the display between parameter and the data at the 1st, the 2nd and the 3rd block.
S2	Up key The numerical value is increased by pressing the key once. The numerical value keeps on increasing by pressing the key continuously. For searching parameters within the 1st, the 2nd and the 3rd block.
S3	Down key The numerical value is decreased by pressing the key once. The numerical value keeps on decreasing by pressing the key continuously. For searching parameters within the 1st, the 2nd and the 3rd block.

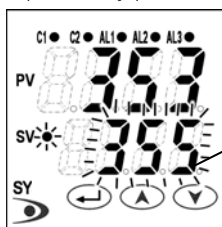
Name	Function
1	Process value (PV) / parameter name display 1) Displays a process value (PV). 2) Displays the parameter symbols at parameter setting mode. 3) Display various error indications (refer to Instruction manual "Chap.8 Error indications.")
2	Set value (SV) indication lamp The lamp is lit while a set value (SV) is displayed.
3	Set value (SV) / parameter setting display 1) Displays a set value (SV). 2) Display the parameter settings at parameter setting mode. 3) Flickers at stand-by mode. 4) Displays the set value (SV) and "SV-1" alternately when the SV switching function is used. 5) Displays the set value (SV) and "rSV" alternately while in remote operation.
4	Auto-tuning/self-tuning indicator The lamp flickers while the PID auto-tuning or the self-tuning is being performed.
5	Control output indication lamp C1: The lamp is lit while the control output 1 is ON. C2: The lamp is lit while the control output 2 is ON. (Note 1)
6	Alarm output 1 (AL1) indication lamp. (Note 1) The lamp is lit when the alarm output 1 is activated. It flickers during ON delay operation. (Note 2)
7	Alarm output 2 (AL2) indication lamp. (Note 1) The lamp is lit when the alarm output 2 is activated. It flickers during ON delay operation. (Note 2)
8	Alarm output 3 (AL3) indication lamp. (Note 1) The lamp is lit when the alarm output 3 is activated. It flickers during ON delay operation. (Note 2)

Note 1: Control output 2 and alarm function are optional.
 Note 2: The lamp does not flicker while the timer is activated.

Display and operation

Standby mode

To perform standby operation, set "Stby" as ON in the 1st block parameter.



Standby mode
 (Output) Control outputs (1 and 2) and alarm outputs (all) are not provided. However, depending on setting of "P-n1", control action, controls are provided at the abnormal input. No alarm output is provided at standby mode, even in (Fault condition).

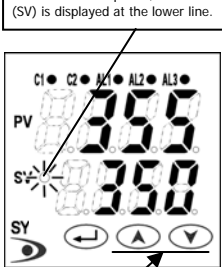
Caution: Be careful since the equipment does not provide output of the alarm of the main unit abnormality during the standby operation.

(Control) Control is not performed.
 (Display) SV display flickers.

Caution: The SV display does not flicker while the 1st, 2nd and 3rd parameter block parameters are displayed.
 (Setting) SV and parameter settings are able to perform.

Operation mode

When the SV lamp is lit, the set value (SV) is displayed at the lower line.



1 Change of set value (SV)

Caution: After the data setting, the data are registered automatically in 3 seconds.

2 shift to the 1st, 2nd and 3rd parameter

To shift to the other blocks press the key

Caution
 Depending on the pressing time of the key you can select the block to shift.

pressing time	Shifting block
About 1 sec. pressing.	1st block
About 3 sec. pressing.	2nd block
About 5 sec. pressing.	3rd block

Parameter setting mode

Press the key for 2 seconds
 3) Shift to operating condition

Operation mode

Parameter setting procedure:

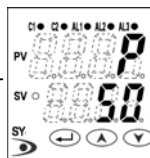
1 Select a parameter you want to set by pressing the or key.
 2-1 Press the key to allow the change (Under the changing condition the parameter set value flickers).

2-2 Press the or key to change the parameter value.

2-3 After the parameter has been changed, press the key for registration.

3 To shift to Operation/Standby mode, press the key for 2 sec.

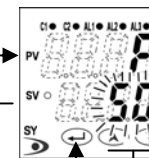
1) Parameter selection



Parameter search



2) Parameter Settings



Parameter change:

Increases parameter set value

Decreases parameter set value

Registers the parameter set value, returning to the parameter shift mode 1

By repeating the same procedure, the parameters can be displayed according to the parameter list shown in 5, Setting methods of temperature and parameters.

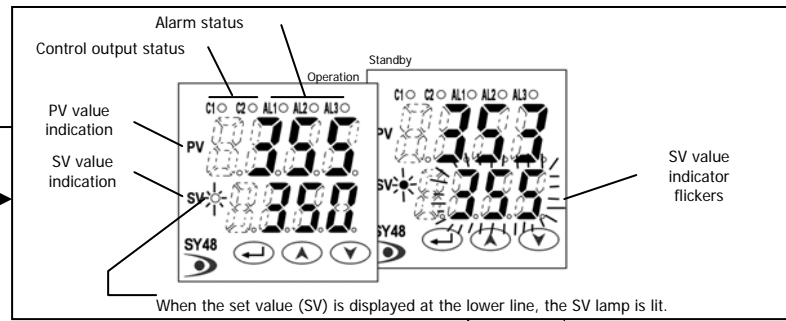
Nota: If the upper display (PV) comes off (or kept distinguished), make the setting once again by adding 64 to the set value of parameter DP13.

Setting methods of temperature and parameters

Caution: Some parameters may not be displayed on the screen, depending upon the types.

Press for about 1 s

Press for about 2 sec.



If no operation status continues for 30 seconds, the screen is restored to the PV/SV display just after the power is turned on.

Press for about 5 sec.

Press for about 2 sec.

Press for about 3 sec.

Press for about 2 sec.

1st BLOCK PARAMETER																																												
Parameter display symbol	Parameter	Parameter	Description	Default Setting	Notes																																							
STby	STbY	Standby settings	Switches RUN or Standby of the control. ON: Control standby (output: OFF alarm: OFF) OFF: Control RUN.	OFF																																								
EMod	Cmod	Control mode	Switches Local and Remote operations. rEM: Remote operation LoCL: Local operation	LoCL																																								
ProG	ProG	Ramp/Soak control	OFF: Stop rUn: Start HLd: Status hold	OFF																																								
LACH	LACH	Alarm latch cancel	0: Keeps the alarm latch 1: Opens up the alarm latch.	0																																								
RF	AT	Auto-tuning	Used for setting the constants P, I and D by auto-tuning 0: OFF 1: Standard AT start 2: low PV type start	0																																								
FA-1	TM-1	Timer 1 display	Time displays indicating the remaining time at the timer mode.	-																																								
FA-2	TM-2	Timer 2 display		-																																								
FA-3	TM-3	Timer 3 display		-																																								
AL1	AL1	Alarm 1 set value	Sets the value at which alarm 1 is detected. AL1 appears only with alarm action type 1 to 10. Setting range: Note 1	10	Table4 Pag.48 Note																																							
AL1-L	A1-L	Lower limit value of alarm 1	Sets the lower limit value at which alarm 1 is detected. A1-L appears only with alarm action type 16 to 31. Setting range: Note 1	10																																								
AL1-H	A1-H	Upper limit value of alarm 1	Sets the upper limit value at which alarm 1 is detected. A1-H appears only with alarm action type 16 to 31. Setting range: Note 1	10																																								
AL2	AL2	Alarm 2 set value	Sets the value at which alarm 2 is detected. AL2 appears only with alarm action type 1 to 10. Setting range: Note 1	10																																								
AL2-L	A2-L	Lower limit value of alarm 2	Sets the lower limit value at which alarm 2 is detected. A2-L appears only with alarm action type 16 to 31. Setting range: Note 1	10																																								
AL2-H	A2-H	Upper limit value of alarm 2	Sets the upper limit value at which alarm 2 is detected. A2-H appears only with alarm action type 16 to 31. Setting range: Note 1	10																																								
AL3	AL3	Alarm 3 set value	Sets the value at which alarm 3 is detected. AL3 appears only with alarm action type 1 to 10. Setting range: Note 1	10																																								
AL3-L	A3-L	Lower limit value of alarm 3	Sets the lower limit value at which alarm 3 is detected. A3-L appears only with alarm action type 16 to 31. Setting range: Note 1	10																																								
AL3-H	A3-H	Upper limit value of alarm 3	Sets the upper limit value at which alarm 3 is detected. A3-H appears only with alarm action type 16 to 31. Setting range: Note 1	10																																								
LoC	Loc	Key lock	Setting of key lock status <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2">Loc</th> <th colspan="2">All parameters</th> <th colspan="2">SV</th> </tr> <tr> <th>Front key</th> <th>Communication</th> <th>Front key</th> <th>Communication</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>O</td> <td>O</td> <td>O</td> <td>O</td> </tr> <tr> <td>1</td> <td>X</td> <td>O</td> <td>X</td> <td>O</td> </tr> <tr> <td>2</td> <td>X</td> <td>O</td> <td>O</td> <td>O</td> </tr> <tr> <td>3</td> <td>O</td> <td>X</td> <td>O</td> <td>X</td> </tr> <tr> <td>4</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>5</td> <td>X</td> <td>X</td> <td>O</td> <td>X</td> </tr> </tbody> </table> <p style="text-align: center;">O: Enabled X: Disabled</p>	Loc	All parameters		SV		Front key	Communication	Front key	Communication	0	O	O	O	O	1	X	O	X	O	2	X	O	O	O	3	O	X	O	X	4	X	X	X	X	5	X	X	O	X	0	
Loc	All parameters		SV																																									
	Front key	Communication	Front key	Communication																																								
0	O	O	O	O																																								
1	X	O	X	O																																								
2	X	O	O	O																																								
3	O	X	O	X																																								
4	X	X	X	X																																								
5	X	X	O	X																																								

2nd BLOCK PARAMETER					
Parameter display symbol	Parameter	Parameter	Description	Default Setting	Notes
P	P	Proportional band	Setting range : 0.0 to 999.9% ON/OFF control when "P" = 0.0	5.0	
I	I	Integral time (reset)	Setting range: 0 to 3200 sec. No integral action when "I" = 0	240	
d	D	Derivative action time	Setting range: 0.0 to 999.9 sec. No derivative action when "D" = 0.0	60.0	
HYS	HYS	Hysteresis for ON/OFF control	Setting range: 0 to 50% FS.	1	
CoOL	CoOL	Proportional band coefficient for cooling side	Setting range: 0.0 to 100.0 ON/OFF control when "CoOL" = 0.	1.0	
db	db	Deadband/Overlap	Setting range: -50.0 to +50.0%	0.0	
CTrL	CTrL	Control algorithm	PID: Runs normal PID control FUZY: Runs PID control with fuzzy logic SELF: Runs PID control with self-running	PID	
TC	TC	Cycle time of control output 1	Setting range: 1 to 150 sec.	30/2	Note 2
TC2	TC2	Cycle time of control output 2	Setting range: 1 to 150 sec.	30/2	Note 2
P-n2	P-n2	Input type code	Setting range: 1 to 16 (1:P1100; 2:TC*J; 3:TC*K*)	3	Table1 Pag.46
P-SL	P-SL	Lower limit of input range	Setting range: -1999 to 9999	-150	Table3 Pag.47
P-SU	P-SU	Upper limit of input range	Setting range: -1999 to 9999	400	
P-dP	P-dP	Setting of decimal point position	Setting range: 0 to 2	0	
PVOF	PVOF	PV Offset	Setting range: -10 to 10%FS	0	
P-dF	P-dF	Time constant of input filter	Setting range: 0.0 a 900.0 sec.	5.0	
ALN1	ALM1	Type of alarm 1	Setting range: 0 a 34	0/5	Table4 Pag.48
ALN2	ALM2	Type of alarm 2		0/9	
ALN3	ALM3	Type of alarm 3		0	
SFRF	STAT	Ramp/Soak status	No setting can be made	OFF	
PTn	PTn	Ramp/Soak execute type	1: Executes 1st to 4th segment 2: Executes 5th to 8th segment 3: Executes 1st to 8th segment	1	
SV-1	SV-1 to SV-8	Ramp target SV-1 to SV-8	Setting range: 0 to 100% FS	0%	
TM1r	TM1r to TM8r	1st Ramp segment time to 8th Ramp segment time	Setting range: 0 to 99h59m	0.00	
TM1S	TM1S to TM8S	1st Soak segment time to 8th Soak segment time	Setting range: 0 to 99h59m	0.00	
Mod	Mod	Setting of Ramp/Soak mode	Setting range: 0 to 15	0	Table5 Pag.49

3rd BLOCK PARAMETER					
Parameter display symbol	Parameter	Parameter	Description	Default Setting	Notes
P-n1	P-n1	Control action	Selects the control action	0/4	Table2 Pag.46
SV-L	SV-L	Lower limit of SV	Lower limit of SV Setting range: 0 to 100% FS.	0%FS	
SV-H	SV-H	Upper limit of SV	Upper limit of SV Setting range: 0 to 100% FS.	100%FS	
dLY1	dLY1	ON delay time of alarm 1	On delay setting for alarm output. Setting range: 0 to 9999 sec.	0	
dLY2	dLY2	ON delay time of alarm 2		0	
dLY3	dLY3	ON delay time of alarm 3		0	
CT	CT	Heather current value	Indicates the heather current value.	-	
Hb	Hb	HB alarm set value	Sets current value to detect the heather break alarm Setting range: 1.0 to 50.0 A, 0: OFF	0.0	Note 2
A1hY	A1hY	Hysteresis for alarm 1	Sets ON-OFF hysteresis for alarm output. Setting range: 0 a 50% FS.	1	
A2hY	A2hY	Hysteresis for alarm 2		1	
A3hY	A3hY	Hysteresis for alarm 3		1	
A1oP	A1oP	Additional function of alarm 1	Additional function of alarm 1, 2 and 3 Alarm latch (1: use; 0: not use) Alarm of error status (1: use; 0: not use) De-energized (1: use; 0: not use) (Note 3)	000	
A2oP	A2oP	Additional function of alarm 2		000	
A3oP	A3oP	Additional function of alarm 3		000	
di-1	di-1	D11 Function	Sets digital input 1 (D11) function Setting range: 0 to 12	0 (OFF)	6-7 Pag.35
di-2	di-2	D12 Function	Sets digital input 2 (D12) function Setting range: 0 to 12	0 (OFF)	6-7 Pag.35
STn	STn	Station number	Communication station number Setting range: 0 to 255	1	
CoM	CoM	Parity setting	Parity setting (baud rate is fixed at 9600bps.) Setting range: 0 to 2	0	6-6 Pag.34
PCoL	PCoL	Communication protocol	Switches communication protocols (1: MODBUS 2: Z-ASCII)	1	
Ao-T	Ao-T	Re-transmission output type	Switches the signals to be output for re-transmission (0: PV ; 1: SV ; 2: MV ; 3: DV)	0	
Ao-L	Ao-L	Re-transmission output scale lower limit	Lower limit of the scaling for re-transmission output Setting range: -100 to 100%	0	
Ao-H	Ao-H	Re-transmission output scale upper limit	Upper limit of the scaling for re-transmission output Setting range: -100 to 100%	100%	
rENB	rEMO	Remote SV input zero point adjustment	Zero point compensation value for remote SV Setting range: -50 to 50% FS	0	
rENS	rEMS	Remote SV input span point adjustment	Span point compensation value for remote SV Setting range: -50 to 50% FS	0	
r-dF	r-dF	Remote SV filter constant	Filter time constant for remote SV Setting range: 0.0 to 900.0 sec.	0.0	
rSV	rSV	Remote SV input value	Remote SV input value (industrial value) (Display only: -1999 to 9999)	-	
dsP1	dsP1 to dsP9	Parameter mask	Specifying parameter mask		
dP10	dP10 to dP13				

Note1: All table/page references in this quick guide, are referred to the users manual.

Note 1: Setting range : 0 to 100% FS (in case of absolute value alarm)
-100 to 100% FS (in case of deviation alarm)

Note 2: When using the heather break alarm, set the parameter "TC" to 20 or more.
Set the "CT" (Current transformer) so that it measures the current of the heather connected to the control output 1.
Disconnection of the control output 2 cannot be detected.
Never set "TC" / "TC2" = 0.

Note 3: De-energized: Contact opens when the alarm "ON"