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Ver. 1.0 MN BOLD 3 [13. Dec]

BOLD3 User Manual YUDO

User Manual

BOLD3

TEMPERATURE CONTROLLER
HOT RUNNER SYSTEMS

CE
ISO9001: 2008

English

YUDO

Thank you very much
for your purchasing BOLD3(Hot-runner Controller)

Please read this manual carefully before installing and
using this controller. Please contact YUDO about any questions.

1. Confirm supplied units and parts

(1) Supplied units and parts

Before operating, please read this manual carefully to avoid problems from misuse. And this manual should be read by field operator for their full understanding on operation procedures, and to be kept at proper place whenever accessible.

- The manual is subject to change without notice for product improvement.
- If you have any questions about product and/or find mistakes in this manual, please contact Head Office or Distributor, from whom you bought.
- We have copy-right of this manual. And it is not allowed by law to copy whole or a part of this manual without our written permission.

1) Confirm supplied units and parts	When it is delivered, please confirm the supplied units and parts if they have right specifications as you ordered first. Further, please confirm its appearance to confirm whether it is damaged or not.
2) Confirm enclosed units and parts	· Operation Manual · BOLD3 Unit · Mold Relay Cable(Option)

(2) Safety Precautions

1) Precautions about this Operating Manual

- The Manual should be delivered to field operator for their understanding on Operation Method and to be kept at proper place whenever accessible.
- Please operate the unit with full understanding and knowledge of the Manual.
- This Operation Manual describes detailed functions of the unit, and we do not warranty the other functions not described herein.
- This Manual is made with utmost care for safety. However, if found omissions or mistakes etc, we appreciate your opinion to Sales Dept. of Head Office or Distributor from whom you bought.
- The Manual is subject to change without notice for product improvement or change in functions.

2) Safety Precautions in operation

- In order to protect the system connected to the unit and for safety purpose, it is requested to strictly follow the instructions described in the Manual.
- We have no responsibility for consequential damages or losses coming from misuse or carelessness or mishandling of the unit.
- When it is necessary to install separate protection or safety circuitry, it should be installed outside to protect the system connected to the unit and for safety purpose. It is not allowed to install the circuitry inside of the unit. Further it is not allowed to change or add something inside.
- Please do not breakdown or repair or change the unit in any way, which may result in electric shock, fire or malfunction.
- Do not give shock on the unit, which may result in serious damage or malfunction.

3) Regarding indemnity

- We do not warranty and have no responsibility for the cases which are not mentioned in the Manual.
- We have no responsibility for consequential damage or loss directly or indirectly to user or to 3rd person from unforeseeable defects or force majeure.

4) Regarding quality guarantee

- We guarantee its quality for one year period from your purchase, during the time we repair the unit at free of charge in case the trouble comes from normal operation as per instructions in the Manual.
- After expiry of said guarantee period, we charge repair cost according to our tariff for repair.
- In case of the trouble coming from following cases, we charge repair cost according to our tariff for repair even in guarantee period.

- Troubles by operator's mishandling
- Troubles by force majeure
- Troubles by moving to the other place after installation
- Troubles by change of the unit at customer's discretion or damage to the unit.
- Troubles coming from unstable power supply

· If repair is necessary for troubleshooting, please contact Head Office or Distributor from whom you bought.

5) Cautions for installation

· Electric wiring should be made without electric power.
· Do not work with wet hands to prevent from electric shock.
· Please refer to installation method for grounding. And do not connect grounding cable to gas pipe, telephone line, or lightning rod.
· Do not supply power until all connections are made between units. Otherwise, it results in trouble.
· Always right rating electricity should be supplied to the unit. Otherwise, it results in electric shock and fire.
· Do not install the unit tilted.
· Avoid installing the unit at following places and environment.
  - Places where person is apt to contact terminals without knowing what he is doing.
  - Place where mechanical vibration or shock may influence the unit.
  - Place where corrosive gas or flammable gas exists.
  - Place where temperature fluctuation is high.
  - Place where is very hot(over 50℃) or very low(below 0℃)
    (Particularly, it needs warm-up for more than 30 minutes when operating the unit at low temperature below 10℃.)
  - Place with direct sunlight
  - Place where is influenced by electronic wave
  - Very humid place over 85% humidity
  - Place where many flammable materials exist
  - Place with dusty or salty materials
  - Place where heat generating equipment exists
  - Place where noise producing equipment exists

2. General Introduction

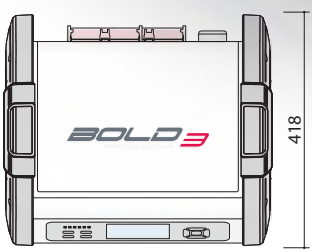
(1) Composition

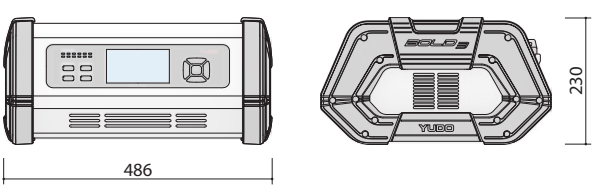
3rd Generation Hot Runner Controller	Zone	T/C Type	Cables	Option 1 RS485	Option 2 DO : 2EA DI : 3EA
BOLD3	04	J(IC)	3: 3Phase 3Cable	0: NO	0: NO
	06	K(CA)	4: 3Phase 4Cable	1: OK	1: OK
	08				
	12				

(2) Appearance

1) Dimensions

Unit : mm





2) Weight

4 ZONE : 21 kg / 6 ZONE : 22 kg
8 ZONE : 23 kg / 12 ZONE : 25 kg

3. Installation

(1) Specifications and right rating

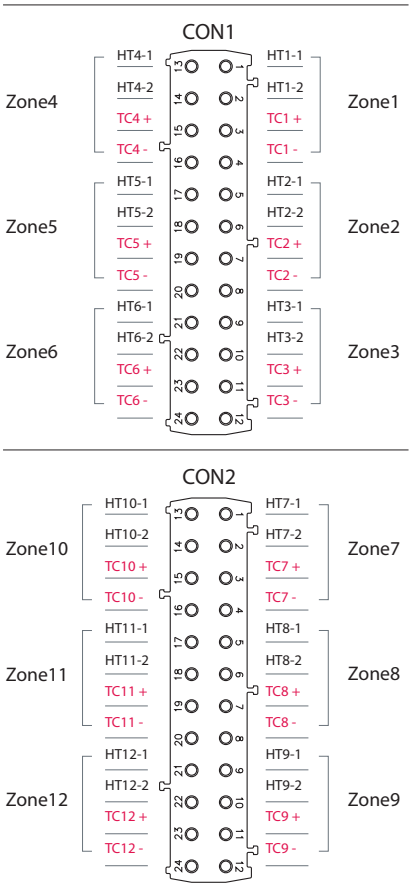
Power Supply	System	220VAC(±10%) 3 phase 3 cable, 50-60Hz 380VAC(±10%) 3 phase 4 cable, 50-60Hz
	Controller Unit	220VAC, 50-60Hz
Operating environment	Temperature	0~50℃
	Humidity	20~90%RH (Non-condensing)
Input	Input zones	4,6,8,12 ZONE
	Input cycle	100ms
	Input type	K(CA), J(IC)
	Input coverage	0~400℃
	Input accuracy	±0.3% of FS
Output	Output type	Triac (Zero-crossing, phase control)
	Output capacity	250VAC/15A
Communication (if option is available)	Rating	RS485
	Type	2 cable type
	Protocol	Modbus RTU
	Speed	19200bps
	Set-up	None parity, 8 Data, 1 Stop bit
	Max. distance	1200m
	Connections	31 units
Contact point output (if option is available)	Number of point	2 points
	Output type	Relay Normal Open
	Output capacity	250VAC 2A, 30VDC 5A
Contact point input (if option is available)	Number of point	2 points
	Input Type	ON/OFF contact point input
Injection signal input (Option)	Number of point	1 point
	Input type	24VDC or 220VAC signal input

(2) Terminal diagram

Cautions

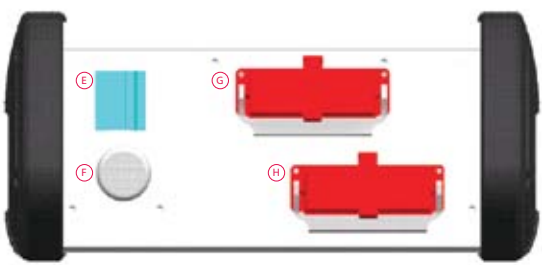
- Cut all power supply to the unit and check if any cable is active before wiring.
- If electricity is supplied, it may bring electric shock.
  Do not contact terminals in any case.
- Again, please cut main power supply for wiring.

MOLD CONNECTOR TERMINAL



(3) Names and functions of each part

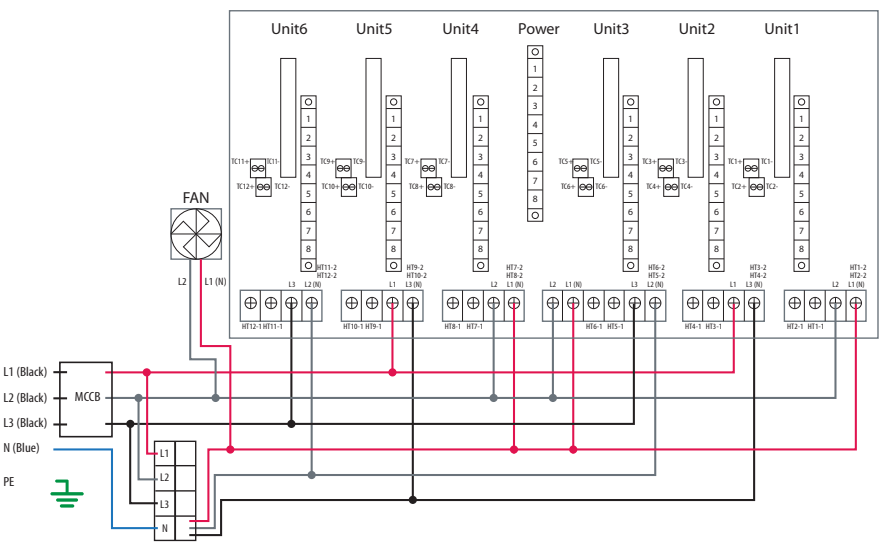
A : ZONE STATUS LED
B : HOT KEY & MENU KEY
C : LCD DISPLAY
D : DIRECTION KEY & SET KEY



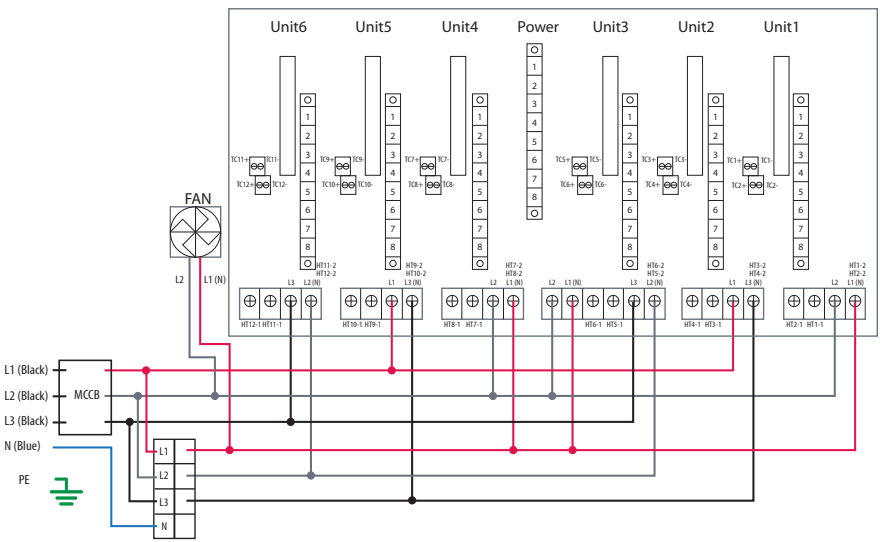
E : MCB (Miniature Circuit Break)
F : POWER Cable
G : 24P Cable CONN. 1
H : 24P Cable CONN. 2

(4) Wiring diagram

- 12 ZONE 380VAC 3 phase 4 cable type



- 12 ZONE 220VAC 3 phase 3 cable type

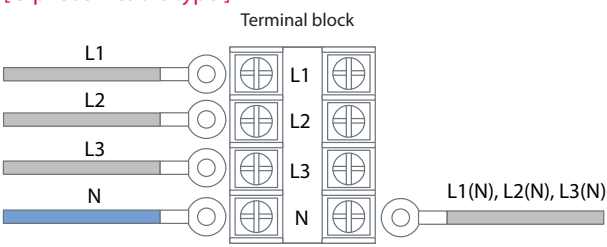


(5) Method & Procedures for Wiring Change

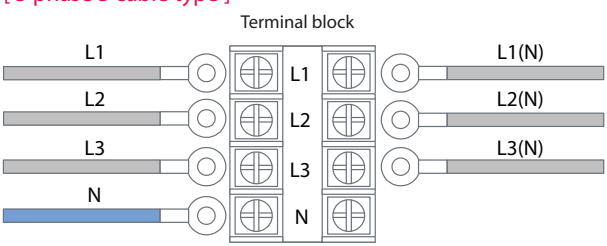
Change from 380VAC 3 phase 4 cable type to 220VAC 3 phase 3 cable type

① Turn off main power (MCCB).
② Release cover bolts on back side to open
③ Separate 3 cables connected to N terminal of 3 phase 4 cable type as per drawing below.
④ Connect each cable to the corresponding terminals of 3 phase 3 cable type as per drawing below.

[3 phase 4 cable type]



[3 phase 3 cable type]



Wiring change from 220VAC 3 phase 3 cable type to 380VAC 3 phase 4 cable type

① Turn off main power (MCCB).
② Release cover bolts on back side to open.
③ Separate 3 cables connected to L1, L2, L3 terminals of 3 phase 3 cable type.
④ Connect each cable to the N terminals of 3 phase 4 cable type.

4. Operation

(1) Operating Procedures and Method

1) Check connector wirings and sensors if they are arrayed as per specifications.
2) Check connector sensors and heater wirings are separated each other.
   Further check if wirings are properly made to corresponding sensors.
3) Check specifications of relays [size of connectors, number of pins].
4) Check heater resistance, insulation, and if sensors are opened or not.
5) Install mold to injection machine and connect it to relay wire.
6) Check main power switch is OFF. If not, make it OFF.
7) Check input power (220 / 380 VAC) is same as set-up power rating.
   If found correct, connect input power. Input power rating is indicated in the label on back side. If input power is different from specified power rating, please contact distributor for proper solution.
   Different input power from specifications results in damage to the unit or malfunction.
8) Grounding cable should be connected to ground. Without grounding, noise may influence the unit to make damage to fuse and TRIAC, finally result in power leakage and electric shock.
9) Check overall wiring arrangements.
10) Make main power switch ON. Under normal condition, fans on both sides are working.

※ *To go to next step, check if FANS are working.*

11) Under normal condition, front LCD display is lit for operation.
12) Check if the operation is working normal.

※ *Input power set-up once in the beginning is enough for further ongoing operations. .*

(2) Controller

Composition of Front Panel

LCD

- Shows PV(present temp.), SV(Set-up temp), MV(Output volume), Sensor type, Present conditions.
- Shows errors in the operation.
- Shows parameters and changes made.

ZONE STATUS

- Indicates conditions of ZONE. Red LED indicates trouble while Blue LED indicates normal operation.

Left HOT key & Menu key

- TEMP.SV : HOT key entering into MENU for SV change.
- RUN/STOP : HOT key entering into MENU to input OPERATION/STOP.
- MODE : HOT key entering into MENU to input STANDBY/ BOOST mode.
- MENU/ESC : HOT key entering into MENU OR RETURN.

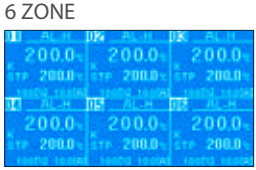
Right direction key

- ▼/▲/◀/▶: Direction Key for moving control sector or value change
- SET: Key for saving the value or value change

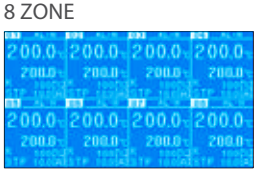
Main Display for different ZONES

4 ZONE

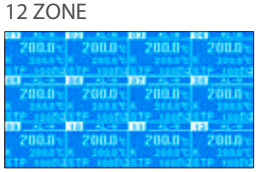
6 ZONE



8 ZONE

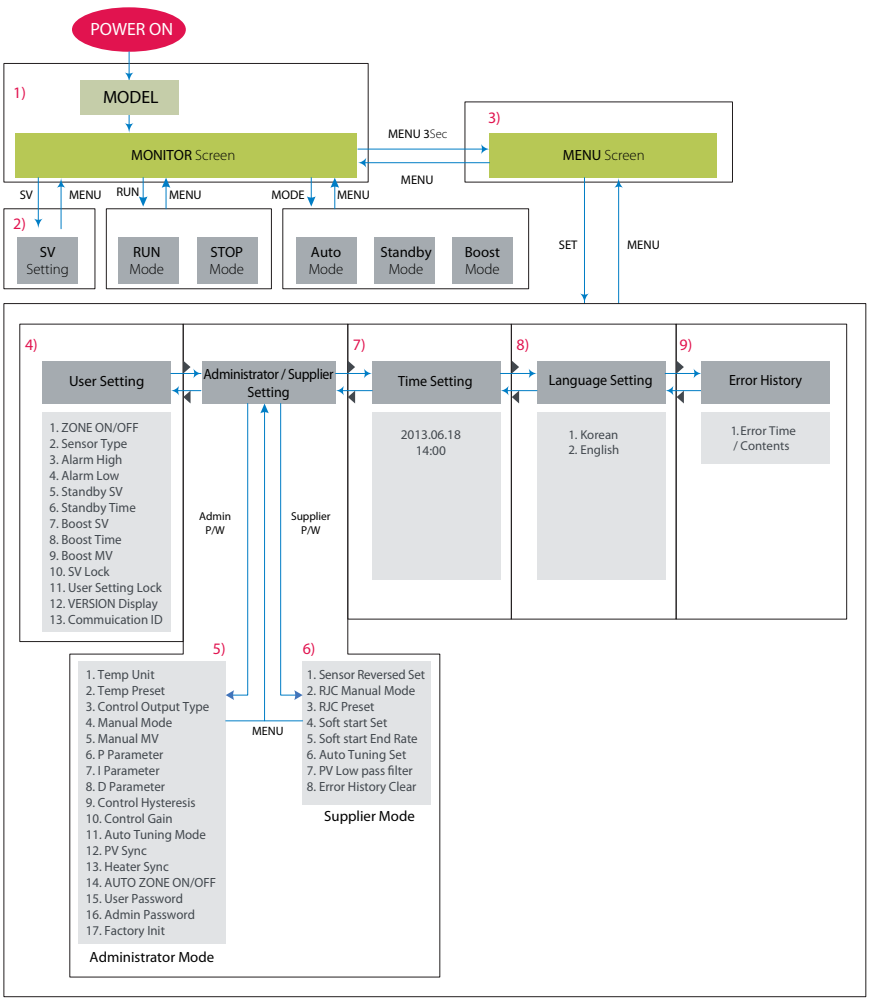


12 ZONE



5. Construction of Monitor Display

(1) Flow of System / Configuration



① Start

POWER ON

4 ZONE

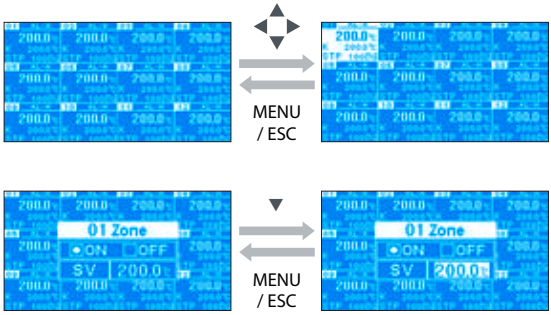
6 ZONE

8 ZONE

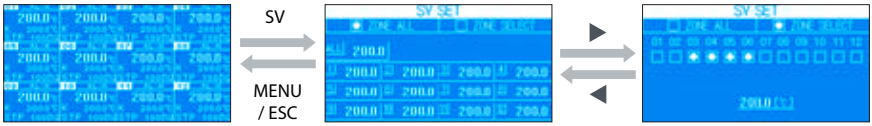
12 ZONE

② Set-up with HOT key

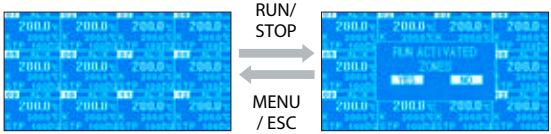
A. Set-up individual Zone



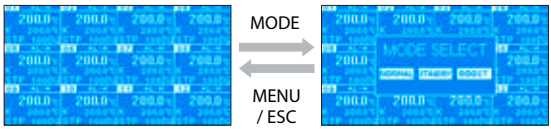
B. Set-up SV



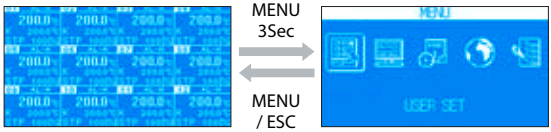
C. RUN/STOP



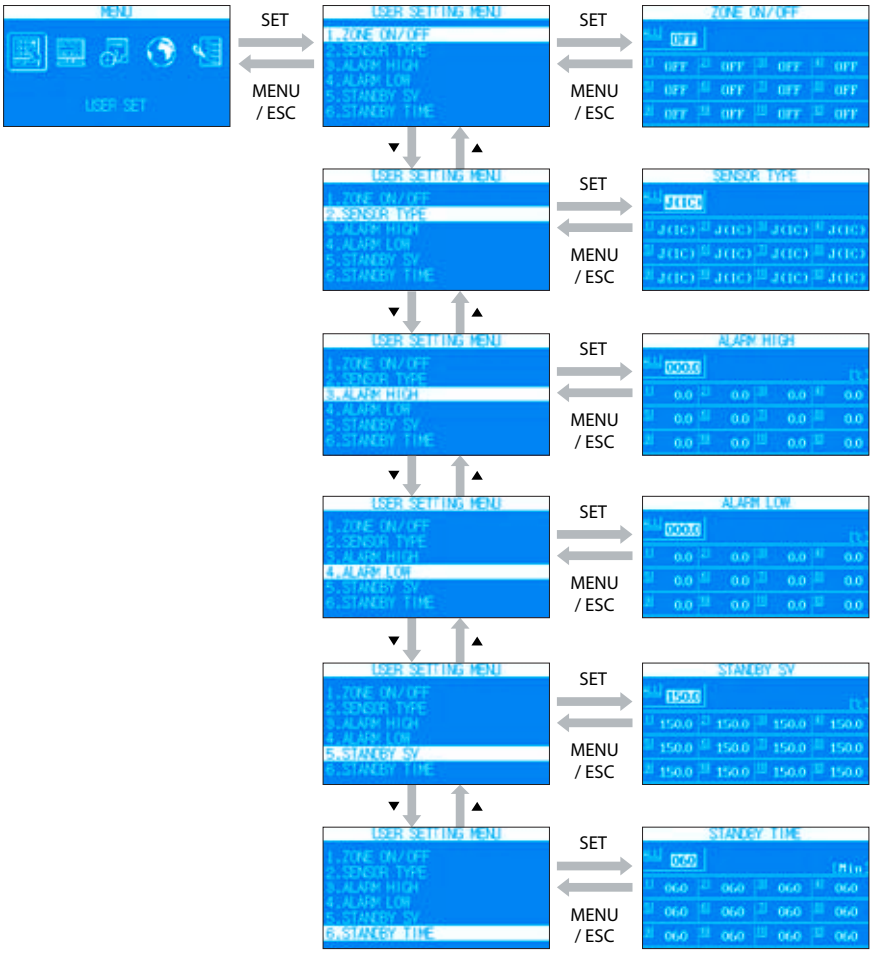
D. Mode selection

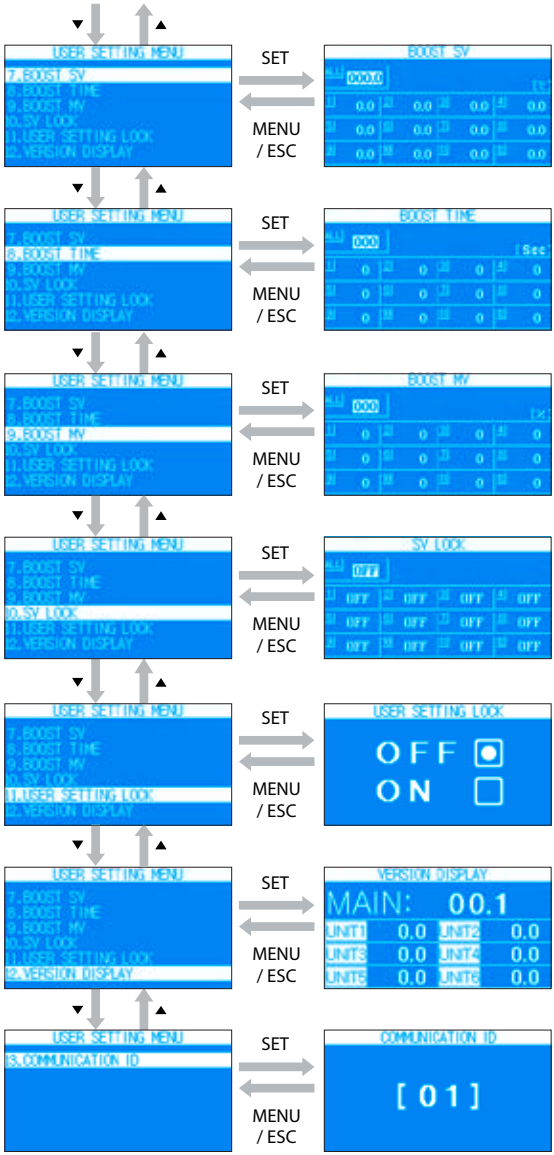


E. Entering Into Zone
Display Or Return

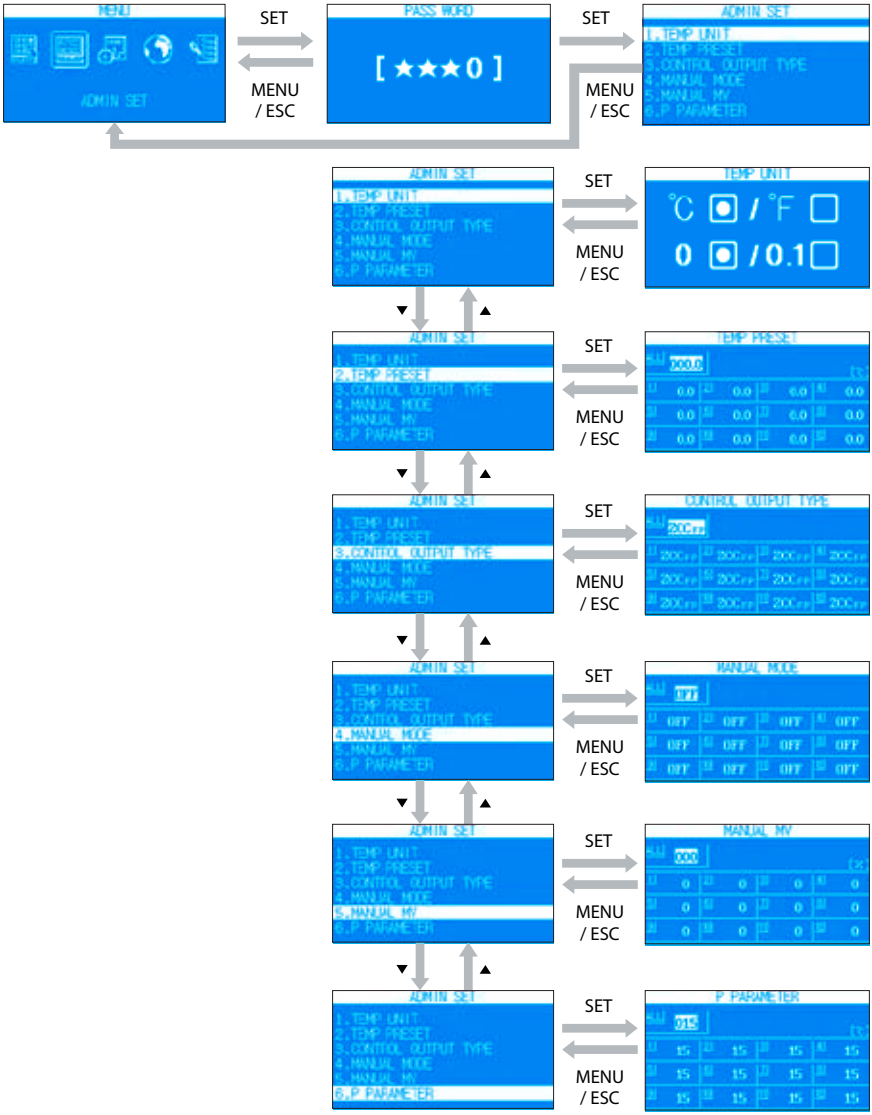


F. USER SET

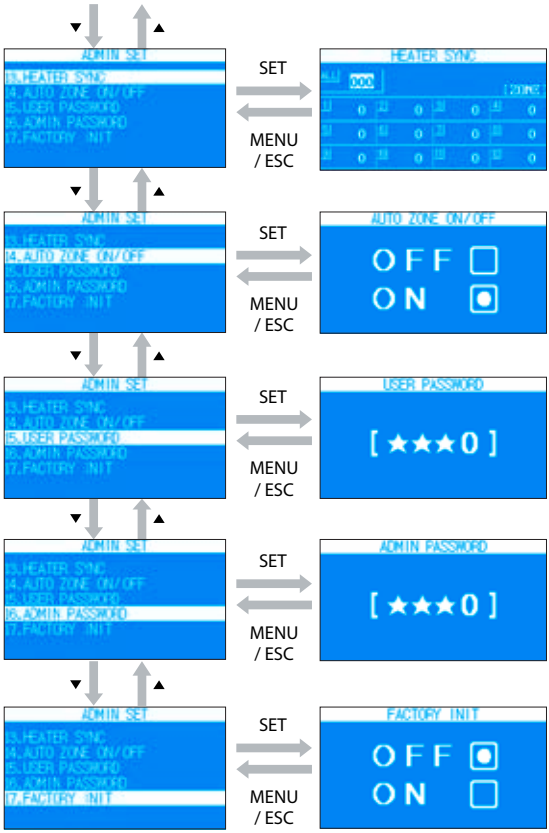

MENU
USER SET
SET
MENU / ESC
USER SETTING MENU
1.ZONE ON/OFF
2.SENSOR TYPE
3.ALARM HIGH
4.ALARM LOW
5.STANDBY SV
6.STANDBY TIME
ZONE ON/OFF
SENSOR TYPE
ALARM HIGH
ALARM LOW
STANDBY SV
STANDBY TIME


USER SETTING MENU
7.BOOST SV
8.BOOST TIME
9.BOOST MV
10.SV LOCK
11.USER SETTING LOCK
12.VERSION DISPLAY
13.COMMUNICATION ID
SET
MENU
/ ESC
BOOST SV
BOOST TIME
[Sec]
BOOST MV
SV LOCK
OFF
USER SETTING LOCK
OFF
ON
VERSION DISPLAY
MAIN: 00.1
UNIT1 0.0
UNIT2 0.0
UNIT3 0.0
UNIT4 0.0
UNIT5 0.0
UNIT6 0.0
COMMUNICATION ID
[01]

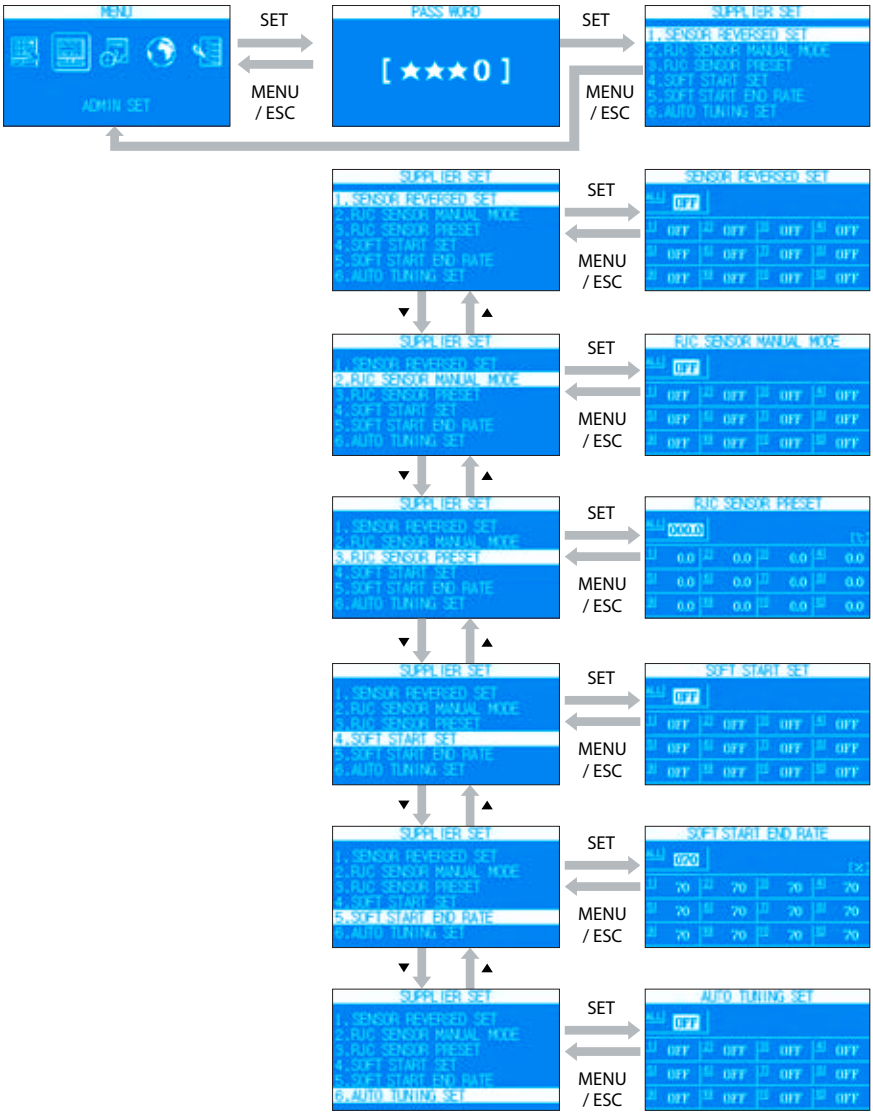
G. ADMIN SET

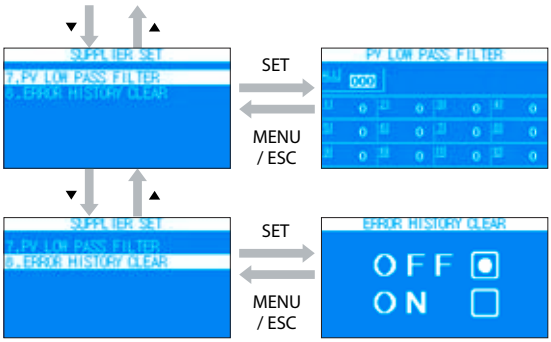

MENU
ADMIN SET
SET
MENU / ESC
PASS WORD
[★★★0]
SET
MENU / ESC
ADMIN SET
1.TEMP UNIT
2.TEMP PRESET
3.CONTROL OUTPUT TYPE
4.MANUAL MODE
5.MANUAL MV
6.P PARAMETER
ADMIN SET
1.TEMP UNIT
2.TEMP PRESET
3.CONTROL OUTPUT TYPE
4.MANUAL MODE
5.MANUAL MV
6.P PARAMETER
SET
MENU / ESC
TEMP UNIT
℃ / ℉
0 / 0.1
ADMIN SET
1.TEMP UNIT
2.TEMP PRESET
3.CONTROL OUTPUT TYPE
4.MANUAL MODE
5.MANUAL MV
6.P PARAMETER
SET
MENU / ESC
TEMP PRESET
ADMIN SET
1.TEMP UNIT
2.TEMP PRESET
3.CONTROL OUTPUT TYPE
4.MANUAL MODE
5.MANUAL MV
6.P PARAMETER
SET
MENU / ESC
CONTROL OUTPUT TYPE
ADMIN SET
1.TEMP UNIT
2.TEMP PRESET
3.CONTROL OUTPUT TYPE
4.MANUAL MODE
5.MANUAL MV
6.P PARAMETER
SET
MENU / ESC
MANUAL MODE
ADMIN SET
1.TEMP UNIT
2.TEMP PRESET
3.CONTROL OUTPUT TYPE
4.MANUAL MODE
5.MANUAL MV
6.P PARAMETER
SET
MENU / ESC
MANUAL MV
ADMIN SET
1.TEMP UNIT
2.TEMP PRESET
3.CONTROL OUTPUT TYPE
4.MANUAL MODE
5.MANUAL MV
6.P PARAMETER
SET
MENU / ESC
P PARAMETER


ADMIN SET
7.I PARAMETER
8.D PARAMETER
9.CONTROL HYSTERESIS
10.CONTROL GAIN
11.AUTO TUNING MODE
12.PV SYNC
SET
MENU
/ ESC
I PARAMETER
D PARAMETER
CONTROL HYSTERESIS
CONTROL GAIN
AUTO TUNING MODE
PV SYNC
OFF
ON

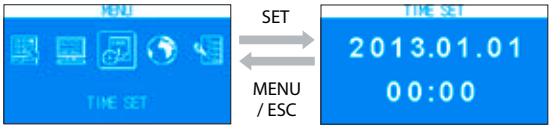

ADMIN SET
3.HEATER SYNC
4.AUTO ZONE ON/OFF
5.USER PASSWORD
6.ADMIN PASSWORD
7.FACTORY INIT
SET
MENU
/ ESC
HEATER SYNC
AUTO ZONE ON/OFF
OFF
ON
USER PASSWORD
[★★★0]
ADMIN PASSWORD
[★★★0]
FACTORY INIT
OFF
ON

H. SUPPLIER SET

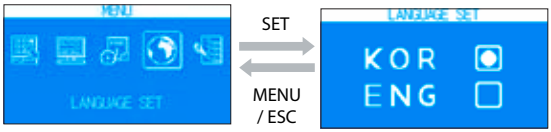




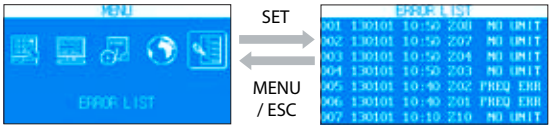
I. TIME SET



J. LANGUAGE SET



K. ERROR LIST

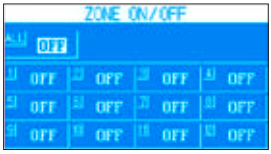


(2) How to change set-up value

▶ Four different methods are available for change of set-up value.

Change of set-up value ① : You can find a cursor with which you can change set-up value of zone selected, and hit SET KEY for saving the value.

Change of set-up value ② : You can find a cursor as per drawing below with which you can change set-up value of the zone selected. Then hit SET KEY for saving the value.



Change of set-up value ③ : You can move white circle with cursor to change set-up value.

Change of set-up value ④ : Following drawing would be displayed for change of password.

Above four methods for set-up value change are applicable in same manner to set-up of user and controller, supplier. In this connection, above numbers would be quoted without explanations henceforth.

1) Model & Monitor Display

- When power switch ON, followings shall be displayed on monitor showing Model Number and present conditions.
- There are 4 different drawings showing 4 ZONE, 6 ZONE, 8 ZONE, 12 ZONE on monitor.

Model display /

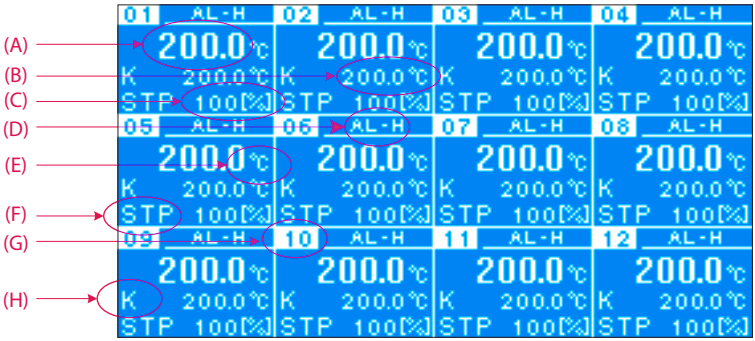
Monitor display / 4 ZONE

6 ZONE

8 ZONE

12 ZONE

Monitor display configuration



(A)PV : Present Temperature
(B)SV : Set-up Temperature
(C)MV : Output volume (0~100%)
(D)Error indicator

- AC.Er : Power frequency error
- AD.Er : ADC error
- AL-H : Alarm Max. error
- AL-L : Alarm Min. error
- Ca.Er : Calibration error
- CT.Er : CT error
- FUSE : FUSE open error
- GR.St : Current monitor error
- HT.OP : Heater open error
- HT.St : Heater short error
- MV_Er : Min. Temp. error
- OV_Er : Max. Temp. error
- RJ.Er : RJC error
- TC.OP : Sensor open
- TC.Re : Sensor wiring mistake
- TC.St : Sensor short error
- Tr_St : TRIAC short error
- Tr_TH : TRIAC overheat

(E)Temp. Unit(℃/℉)
(F)Current Status

- STP : Stop
- RUN : Running
- STBY : Standby
- BST : Boost

(G)Zone Activity Indicator(Enable/Disable)
(H)Sensor Type(K/J)

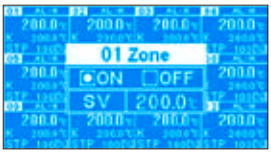
2) Applications with HOT Keys

▶1. Set-up of individual ZONE

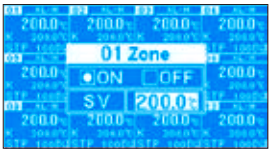
You can select simply WANTED ZONE to make it Active/Inactive or to change SV set-up value.

i) Select WANTED ZONE from monitor display with up/down and left/right Key.

ii) Once SET Key is pressed, following drawing will appear for set-up new value. Then select ZONE On/Off with left/right Key. Further, press SET Key for saving.

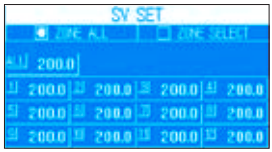


iii) In case, you want to set-up SV and press DOWN key, following drawing will be displayed. Press SET Key to set-up wanted temperature and press SET Key again for saving.

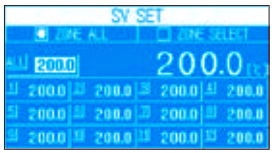


▶ 2. SV

Two different types shall be displayed as follows. You can select one of two types with left/right Key and press SET Key or DOWN Key.



i) ZONE ALL : Useful to change all or individual ZONE. First select wanted ZONE with direction KEY. And press SET Key or DOWN Key to have following drawing to be appeared. In this drawing, you can set-up new value with direction Key and press SET Key again for saving.



ii) ZONE SELECT : It is applicable to change set-up value for the ZONE selected. Select WANTED ZONE(S) with SET Key and press DOWN Key to have following drawing. Then change set-up value with Direction Key and press SET Key for saving.

▶ 3. RUN/STOP

Useful to select RUN/STOP operation. Select one with left/right Key. If all ZONES are inactive, left drawing shall be appeared while even one ZONE is in operation, right drawing shall be appeared.

▶4. MODE

· Applicable to choose the other MODE under operating condition.
  Select MODE with left/right Key, then press SET Key for saving.
· Three MODES are available (NORMAL, STANDBY, BOOST) for selection.
· NORMAL MODE is operating by normal control.
· STANDBY MODE is used for maintaining preset temperature during
  the preset time.
· BOOST MODE is used for increasing output at preset volume
  for the preset time at preset temperature. It stops BOOST MODE
  when either one of preset temperature or time reaches preset value.

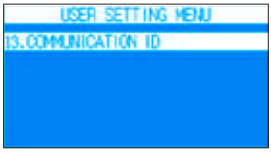
3) Monitor Display for MENU selection

-Press MENU/ESC Key for 3 seconds to have following display.
-Select a MENU and press SET Key for entering sub category MENU.
-For setting USER and ADMIN, you have to select one from
  sub category MENU.

4) USER SETTING MENU

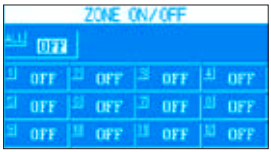
- On the MENU display, you can select USER SETTING MENU with left/right KEY and hit SET KEY to enter into lower category MENU.

- Followings would be displayed in Lower MENU, and you would select one and hit SET KEY to enter into selected menu.



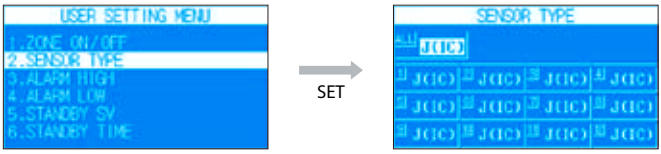
▶1. ZONE ON/OFF

SET



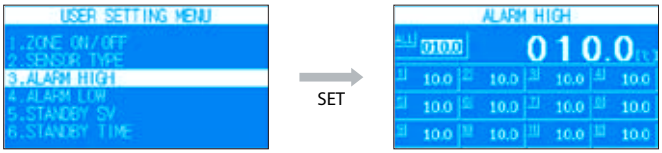
You can decide to make ZONE RESPECTIVELY active or inactive. As you understand, it is possible to operate under active condition of course. Further, under active condition it is possible to monitor error to indicate ERROR MESSAGE with buzzer sound. On the contrary, under inactive condition it NOT possible to operate and to monitor error. You can change set-up value according to Change of set-up value ② (page 27).

▶2. SENSOR TYPE



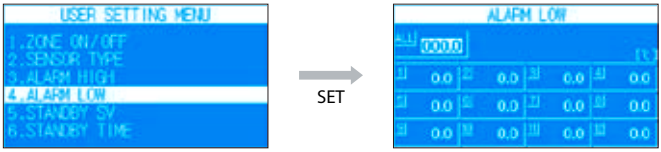
Two types of sensor, K(CA), J(IC) are used for the unit. Depending on the sensor type used for mold, sensor type is to be decided. You can change preset value according to Change of set-up value ② (page 27).

▶3. ALARM HIGH

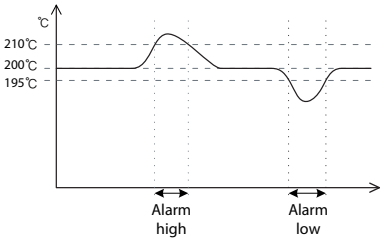


This is to make alarm when the operating temperature is higher than preset Maximum temperature (preset temperature + Max. Limit). For example, if max. limit is preset at 10℃ based on 100℃ SV temperature, it alarms when operating temperature is higher than 110℃. You can change preset value according to Change of set-up value ①(page 27).

▶4. ALARM LOW

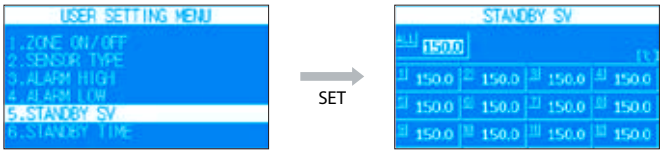


This is to make alarm when the operating temperature is lower than preset Minimum temperature (preset temperature – Min. Limit). For example, if min. limit is preset at 10℃ based on 100℃ SV temperature, it alarms when operating temperature is lower than 90℃. You can change preset value according to Change of set-up value ①(page 27).



Above drawing shows two alarming cases when you set-up alarming Max. Limit with 10℃, alarming Min. Limit with 5℃. Alarm sounds during operation of equipment.

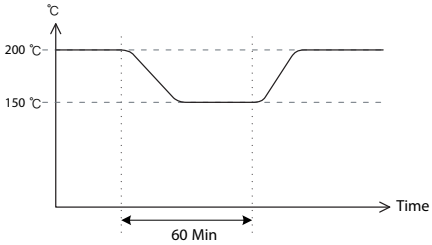
▶5. STANDBY SV



This is to maintain preset temperature in STANDBY MODE for the preset time by selecting STANDBY MODE under operating condition. When STANDBY TIME passed, it returns to RUN MODE. You can change preset value according to Change of set-up value ①(page 27).

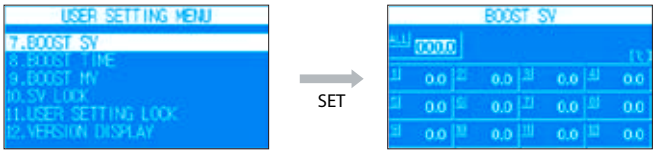
▶6. STANDBY TIME

This is to maintain preset temperature in STANDBY MODE during preset STANDBY TIME by selecting STANDBY MODE under operating condition. When STANDBY TIME passed, it returns to RUN MODE. You can change preset value according to Change of set-up value ①(page 27).



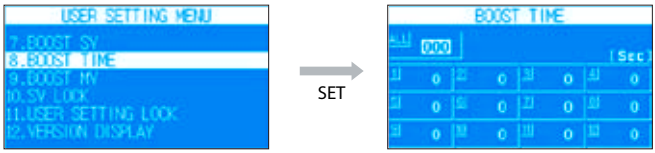
Above drawing shows operation with 150℃ STANDBY Temperature and 60 min. STANDBY Time.

▶7. BOOST SV



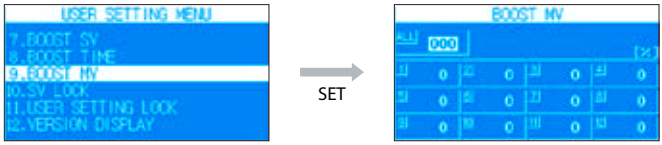
This is useful to set-up BOOST SV during BOOST TIME. When in operation, select BOOST MODE and BOOST SV. You can change preset value according to Change of set-up value ①(page 27).

▶8. BOOST TIME

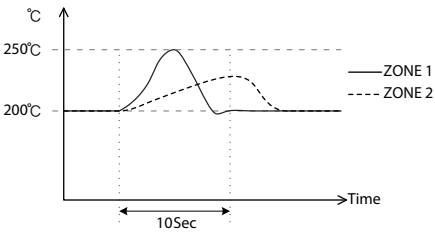


This is useful to set-up BOOST TIME in BOOST MODE. When in operation, select BOOST MODE and BOOST TIME. You can change preset value according to Change of set-up value ①(page 27).

▶ 9. BOOST MV

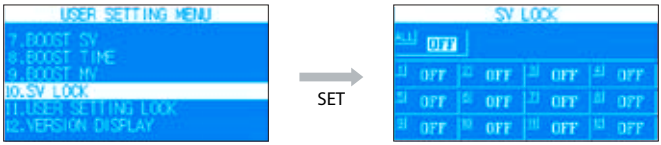


This is useful to set-up required BOOST MV in BOOST Mode during BOOST Time. When in operation, select BOOST Mode and BOOST MV. You can change preset value according to Change of set-up value ① (page 27).



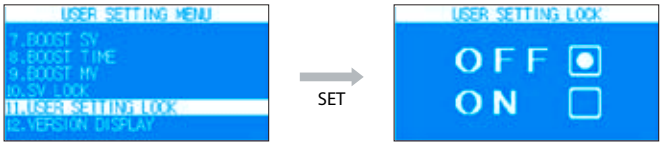
Above drawing shows operation with 250℃ BOOST SV and 10 sec. BOOST Time, 100% BOOST MV.

▶ 10. SV LOCK



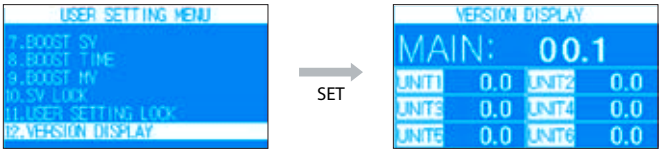
This is useful to protect certain zone from unwanted change of SV VALUE. It is possible to set-up each zone with ON(to make the zone active) and OFF(to make the zone inactive). You can change preset value according to Change of set-up value ②(page 27).

▶ 11. USER SETTING LOCK



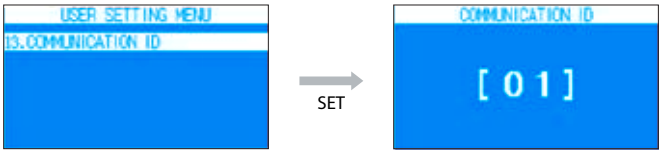
This is useful to decide whether it is necessary to input PASSWORD in USER SET-UP. You can select either one of ON or OFF. You can change preset value according to Change of set-up value ③(page 27).

▶12. VERSION DISPLAY



It is useful to confirm VERSION of the unit and DISPLAY, which is unchangeable.

▶13. COMMUNICATION ID

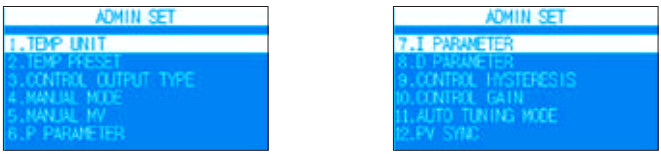


If COMMUNICATION OPTION is available, it is useful to set-up COMMUNICATION ID from 01 to 99.

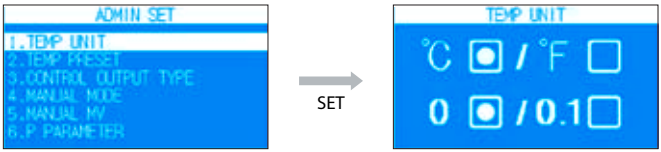
5) ADMIN SET

- If you find following drawing in MENU, select ADMIN SET with left/right Key. Then it requires to input PASSWORD of CONTROLLER. After input of PASSWORD, sub-category MENU will be appeared. If you input SUPPLIER PASSWORD, it will go into SUB CATEGORY MENU for SUPPLIER.

- Followings are Sub-category MENU. You can select with up/down Key. Press SET Key for saving, which enables to entering into changed drawing.

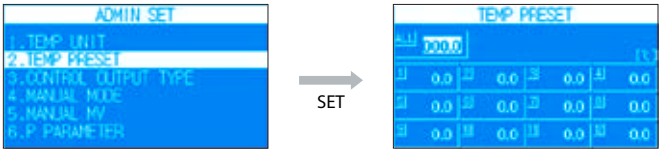


▶1. TEMP UNIT



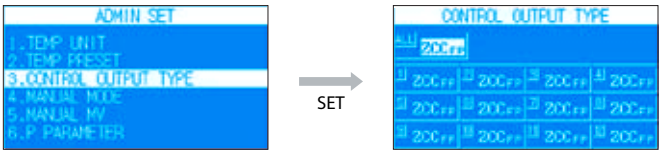
You can select temperature unit in C. degree or F. degree, and with prime number or with decimal point as well. You can change preset value according to Change of set-up value ③(page 27).

▶2. TEMP PRESET

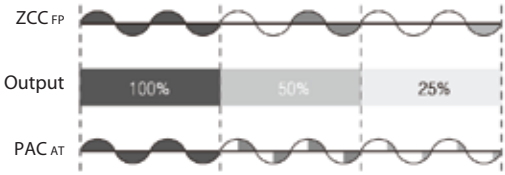


It is useful to compensate certain value if there is a difference between actual temperature and SV temperature. You can change preset value according to Change of set-up value ①(page 27).

▶3. CONTROL OUTPUT TYPE

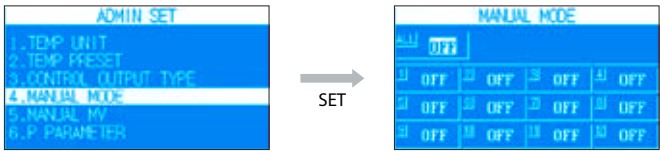


This is useful to decide Output MODE. At the moment, Phase Angle Control(Auto) and ZERO CROSSING(Zero Cross Control(Fix Pulse)) are available.



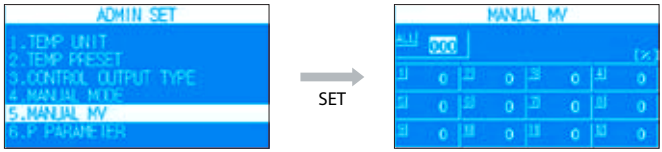
You can change preset value according to Change of set-up value ②(page 27).

▶4. MANUAL MODE



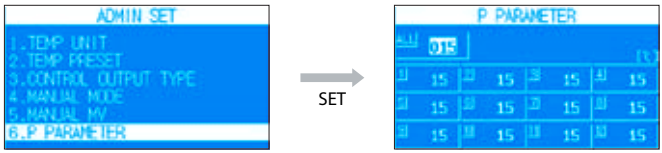
It is used for set-up MANUAL MODE with ON. If designated ZONE is under NORMAL OPERATION, it outputs with preset volume. You can change preset value according to Change of set-up value ②(page 27).

▶5. MANUAL MV



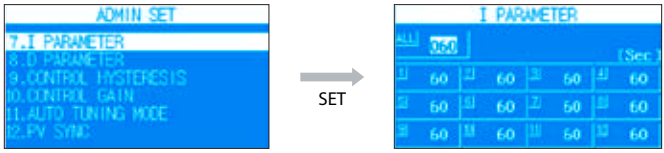
It is used for set-up MANUAL MV. MANUAL MV will be produced in the Zones with preset ON on MANUAL MODE. You can change preset value according to Change of set-up value ①(page 27).

▶6. P PARAMETER



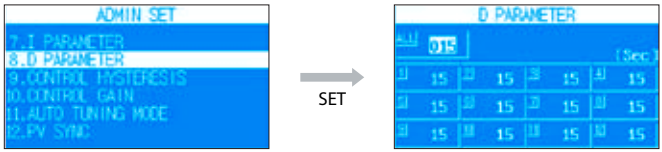
It is useful to set-up Propotional Control Parameter in PID Control. We do not recommend changing preset value because it may influence Temperature Control. You can change preset value according to Change of set-up value ①(page 27).

▶7. I PARAMETER



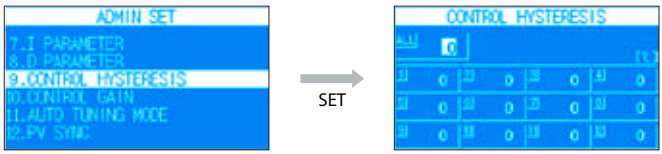
It is useful to set-up Integration Control Parameter in PID control. We do not recommend changing preset value because it may influence Temperature Control. You can change preset value according to Change of set-up value ①(page 27).

▶8. D PARAMETER



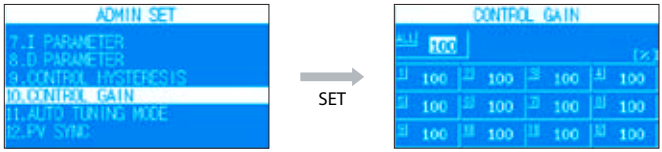
It is useful to set-up Differential Coefficient Parameter in PID control. We do not recommend changing preset value because it may influence Temperature Control. You can change preset value according to Change of set-up value ①(page 27).

▶9. CONTROL HYSTERESIS



It is useful parameter to control ON/OFF. We do not recommend changing preset value because it may influence Temperature Control. You can change preset value according to Change of set-up value ① (page 27).

▶10. CONTROL GAIN

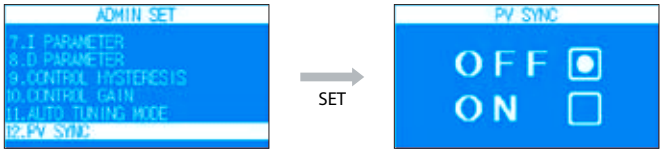


It is useful to set-up CONTROL GAIN. We do not recommend changing preset value because it may influence TEMPERATURE CONTROL. You can change preset value according to Change of set-up value ①(page 27).

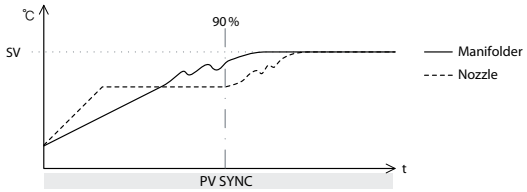
▶11. AUTO TUNING MODE

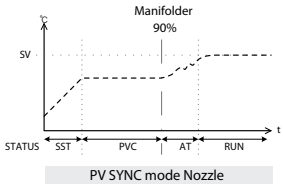
Two AUTO TUNING MODES are available, FULL and QUICK MODE. AUTO TUNING is processing with raising Temperature in QUICK MODE, while preset TUNING MODE is working in FULL TUNING MODE. You can change preset value according to Change of set-up value ②(page 27).

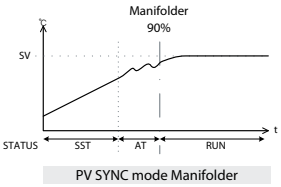
▶12. PV SYNC



When we raise temperature, in case nozzle gets heat faster than manifold, there would be gas emission or carbonization. In order not to have such problem, it is useful to make them get heat at the same phase.

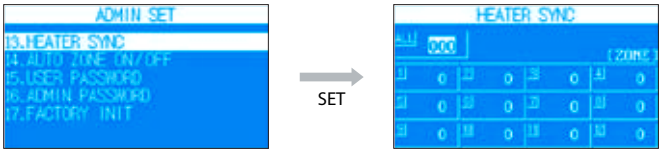






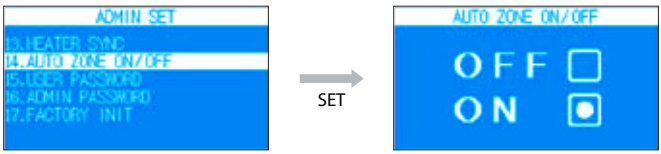
As per two drawings above, at the time of Completion Of Nozzle's Soft Start, it controls nozzle and manifold separately. Nozzle will maintain the temperature of Soft Start until manifold gets heat 90% of SV Temperature. And when manifold gets over 90% heat of SV, Nozzle Gets Heat to reach SV at about same time as MANIFOLD. You can change preset value according to Change of set-up value ③(page 27).

▶13. HEATER SYNC



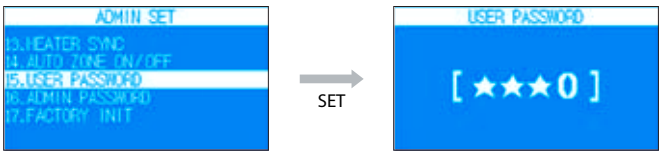
It is useful to control the ZONE where sensor has opened with same heater as the ZONE equipped with. For this function, you can set-up the ZONE number to have damaged ZONE same output. You can change preset value according to Change of set-up value ①(page 27).

▶14. AUTO ZONE ON/OFF



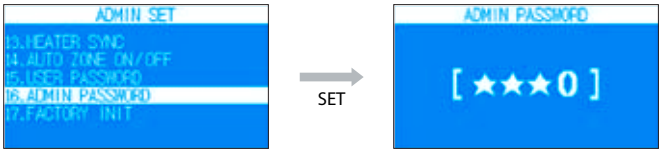
It is useful to set-up each ZONE unit to make it automatically ON or OFF, when we make Switch-On. In case of OFF, you may activate ZONE at ZONE ON/OFF MENU as per preset value. You can change preset value according to Change of set-up value ③(page 27).

▶15. USER PASSWORD



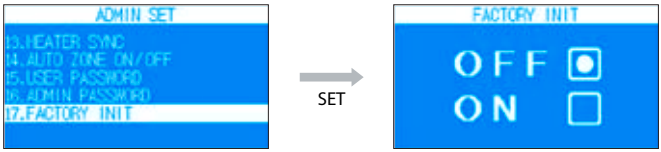
It is used for set-up User Password. You can change User Password when you input preset User Password. You can change preset value according to Change of set-up value ④(page 27).

▶16. ADMIN PASSWORD



It is used for set-up Administrator Password. You can change Administrator Password when you input preset Administrator Password. You can change preset value according to Change of set-up value ④(page 27).

▶17. FACTORY INIT

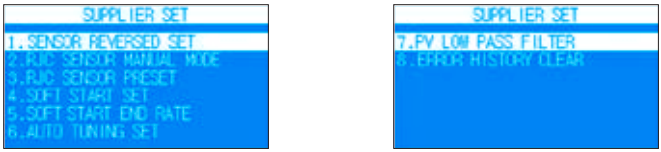


It is used to reset to factory specifications. In case you select ON, the system is working for reset to factory preset specifications with taking some time. When RESET is completed, it shows OFF automatically. Until that time, operator should wait without working with the unit.
You can change preset value according to Change of set-up value ③ (page 27).

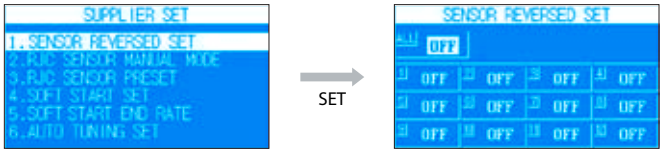
6) SUPPLIER SET

-First select CONTROLLER SET-UP, and then press SET Key to have ADMIN PASSWORD on monitor. At this time, if you input SUPPLIER PASSWORD, it goes to sub-category for SUPPLIER MENU.

-Sub-category is as follows to select with up/down Key.
Then press SET Key to enter into sub MENU

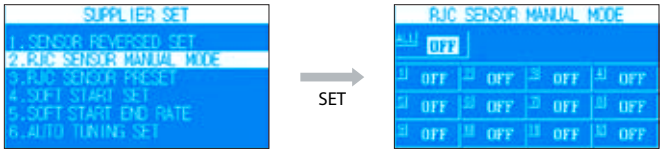


▶1. SENSOR REVERSED SET



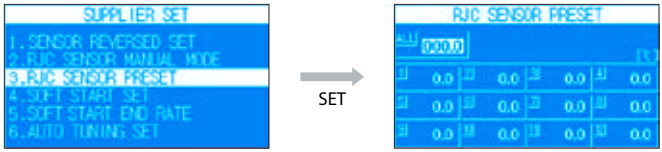
When you found problem in MOLD SENSOR POLARITY or in wiring between MOLD and CONTROLLER TERMINAL, CONTROLLER comes to know there is a problem in SENSOR POLARITY. If you set-up ON, the unit senses that SENSOR POLARITY has been changed. You can change preset value according to Change of set-up value ②(page 27).

▶2. RJC SENSOR MANUAL MODE



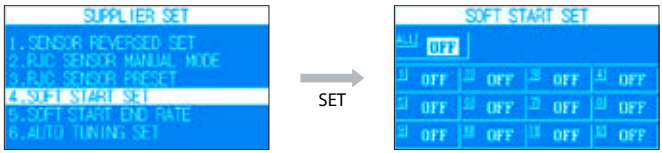
If you found a problem with RJC SENSOR, you can SET-UP RJC SENSOR VALUE IN MANUAL. However, there may be some difference in PV TEMPERATURE. You can change preset value according to Change of set-up value ②(page 27).

▶3. RJC SENSOR PRESET



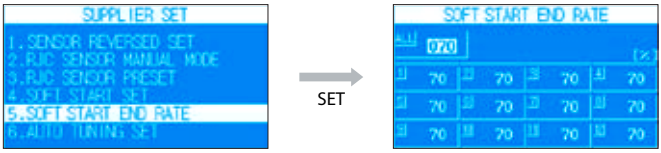
If you find DIFFERENCE between TERMINAL TEMPERATURE and RJC SENSOR TEMPERATURE, you can assign certain value to have them same TEMPERATURE. You can change preset value according to Change of set-up value ①(page 27).

▶4. SOFT START SET



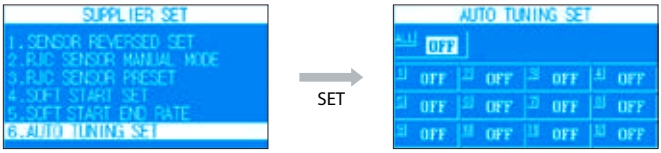
It is useful to set-up SOFT START when we start operating the unit. If you set-up ON, it implements SOFT START. You can change preset value according to Change of set-up value ② (PAGE 27).

▶5. SOFT START END RATE



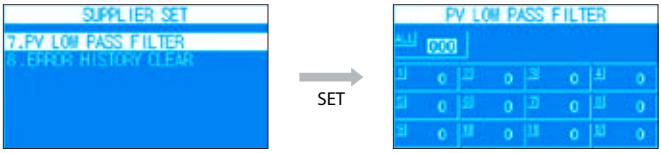
It is useful to set-up SOFT START COMPLETION TEMPERATURE PERCENTAGE in comparison with SV TEMPERATURE. For example, SV temperature is 300℃ while SOFT START is 50%, SOFT START will be going up to 150℃. You can change preset value according to Change of set-up value ①(page 27).

▶6. AUTO TUNING SET



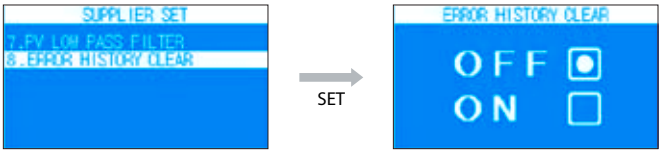
It is useful to have the unit AUTO TUNING automatically. In this case, for each ZONE with ON, it will have AUTO TUNING process whenever it starts operation.You can change preset value according to Change of set-up value ②(page 27).

▶7. PV LOW PASS FILTER



It is useful to set-up to show AVERAGE TEMPERATRE for certain time to represent PRESENT TEMPERATURE. You can change preset value according to Change of set-up value ①(page 27).

▶8. ERROR HISTORY CLEAR



It is useful to delete all ERROR HISTORY. If you click ON, all ERROR HISTORY shall be deleted. You can change preset value according to Change of set-up value ③(page 27).

7) TIME SET

- Select TIME on MENU display with left/right Key. Once SET Key is pressed, it will go to sub category MENU to set-up present time.

- On this display, you can change the time with up/down, left/right Key and press SET KEY for saving. SET KEY must be pressed for saving.

8) LANGUAGE SET

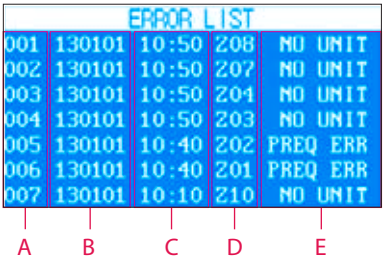
- Select LANGUAGE from MENU DISPLAY with left/right Key and press SET KEY to go into LANGUAGE SETTING MENU.

- Select wanted LANGUAGE on the screen below with up/down Key and press SET KEY for saving. At the moment, two languages, KOREAN and ENGLISH are available. You can change preset value according to Change of set-up value ③(page 27).

9) ERROR LIST

- Select ERROR LIST ON MENU DISPLAY with left/right KEY, and press SET KEY to go into DISPLAY FOR ERROR LIST.

- From the display below, we can confirm ERROR LIST filed to present time with up/down KEY. It is NOT CHANGEABLE and JUST FOR REFERENCE. It accommodates maximum 180 errors.



A : Serial number
B : Year/ Month/ Date
C : Time
D : ZONE
E : Error details

(3) TABLE FOR PARAMETERS

▶OPERATION DISPLAY

Setting	Meaning	Category	Use-ability	Factory Preset
MODE	Mode Selection	NORMAL STANDBY BOOST	whenever	NORMAL
SV	Temperature Target	0~400℃	whenever	0℃
RUN/STOP	Run/stop Selection	RUN, STOP	whenever	STOP

▶ SET-UP USER

Setting	Meaning	Category	Use-ability	Factory Preset
ZONE ON/OFF	Selection Of Zone Activity	ON/OFF	whenever	ON
SENSOR TYPE	Selection Of Sensor Type	K(CA) / J(IC)	whenever	K(CA)
ALARM HIGH	Set Up Alarming Max Limit	0~400℃	whenever	0℃
ALARM LOW	Set Up Alarming Min Limit	0~400℃	whenever	0℃
STANDBY SV	Set Up Temp. In Standby Mode	0~400℃	whenever	150℃
STANDBY TIME	Set Up Time In Standby Mode	0~999 Min	whenever	60 Min
BOOST SV	Temp In Boost Mode	0~400℃	whenever	0℃
BOOST TIME	Running Time In Boost Mode	0~999 Sec	whenever	0 Sec
BOOST MV	Output In Boost Mode	0~100 %	whenever	0 %
SV LOCK	Locking Zone Sv Value.	ON/OFF	whenever	OFF
USER SETTING LOCK	Locking User	ON/OFF	whenever	OFF
VERSION DISPLAY	Model And System Version No.	-	whenever	-
COMMUNICATION ID	Set Up Communication Id	01~99	whenever	01

▶ SET-UP ADMIN

Setting	Meaning	Category	Use-ability	Factory Preset
TEMP UNIT	Dicimal Point, F. Degree, C.Degree Selection	0 / 0.1 , ℃ / ℉	whenever	0 , ℃
TEMP. PRESET	Set Up Temp. Compensation	-99~999 ℃	whenever	0 ℃
CONTROL OUTPUT TYPE	Selection Output Controlmode	ZCCfp / PACat	whenever	ZCCfp
MANUAL MODE	Selection Of Manual Output	ON/OFF	whenever	OFF
MANUAL MV	Set Up Manual Output Volume	0~100 %	whenever	0 %
P PARAMETER	Set Up Proportional Control Ratio	0~400 ℃	whenever	15 ℃
I PARAMETER	Set Up Integral Control Value	0~3600 Sec	whenever	60 Sec
D PARAMETER	Set Up Differential Control Value	0~3600 Sec	whenever	15 Sec
CONTROL HYSTERESIS	Set Up Value For Control	0~10 ℃	whenever	0 ℃
CONTROL GAIN	Set Up Proportional Amp. Ratio	0~100 %	whenever	100 %
AUTO TUNING MODE	Selection Of Auto Tuning Mode	QUICK / FULL	whenever	QUICK
PV SYNC	Control Same PV Value Between Channels	ON / OFF	whenever	OFF
HEATER SYNC	Set Up Zones to be Synchronized	0~12 ZONE	whenever	0 ZONE
AUTO ZONE ON/OFF	Set Up Auto Zone ON/OFF	ON / OFF	whenever	ON
USER PASSWORD	Set Up User Password	0000~9999	whenever	0000
ADMIN PASSWORD	Set Up Administer Password	0000~9999	whenever	0000
FACTORY INIT	Reset To Factory Preset Value	ON / OFF	whenever	OFF

▶ SET-UP SUPPLIER

Setting	Meaning	Category	Use-ability	Factory Preset
SENSOR REVERSED SET	Select when sensor polarity is reversed	ON / OFF	whenever	OFF
RJC SENSOR MANUAL MODE	Set up when RJC sensor has problem	ON / OFF	whenever	OFF
RJC SENSOR PRESET	Set up Temp. Compensation Value of RJC sensor	-50~50 ℃	whenever	0 ℃
SOFT START SET	Slection to activate SOFT START	ON / OFF	whenever	OFF
SOFT START END RATE	Set up Proportional Temp. Ratio for completion of SOFT START in comparison with SV Temp.	0~100 %	whenever	0 %
AUTO TUNING SET	Set up Auto Tuning	ON / OFF	whenever	ON
PV LOW PASS FILTER	Set up filtering value of PV	0~100	whenever	0
ERROR HISTORY CLEAR	Selection whether to delete error report or not	ON / OFF	whenever	OFF

▶ TIME SET-UP

Setting	Meaning	Category	Use-ability	Factory Preset
TIME SET	Set up current time	–	–	–

▶ LANGUAGE SET-UP

Setting	Meaning	Category	Use-ability	Factory Preset
LANGUAGE SET	Selection of language	KOR / ENG	permanent	KOR

▶ ERROR LIST

Setting	Meaning	Category	Use-ability	Factory Preset
ERROR LIST	Check error report	–	–	–

▶TROUBLE SHOOTINGS

Error Indicator	Meaning	Trouble Shooting
TC.St	Sensor Wire Opened	Check sensor wire of mold to replace the sensor
TC.OP	Sensor Wire Short	Check sensor wire of mold to replace the sensor
TC.Re	Reversed Polarity of Sensor Wire	Check connecters of mold and controller if its polarity is reversed. If yes, change wiring to have right polarity.
Tr_St	TRIAC Short	Continue to produce output due short triac short. Replace TRIAC.
Tr_TH	TRIAC Overheat	Check if grease is sufficient between triac and heat sink. also check if two fans are properly working. If they are not working, replace it.
FUSE	Fuse Short	Replace fuse of the zone in trouble.
HT.OP	Heater Short	Check heater wiring to replace heater.
HT.St	Heater Open	Check if heater and mold are connected correctly.
Ca.Er	Calibration Error	Not calibrated or wrong calibration was made. Contact manufacture to calibrate.
CT.Er	CT current Error	Failure in monitoring current. Contact manufacturer to verify problem.
AD.Er	ADC Error	Defect of ad converter. Contact manufacturer to verify problem.
AC.Er	AC Monitoring Error	No signal about ac. Check wirings. If no problem found, contact manufacturer to verify problem.
RJ.Er	RJC Error	Check if connection to rjc is correctly wired. If no problem found, contact manufacturer to verify problem.
MV_Er	Lower Temp. than lowest limit	Check if temp. Sensor works properly
OV_Er	Higher Temp. than highest limit	Check if temp. Sensor works properly
AL-H	Higher Temp. than highest Temp. tolerance	Temp. Is higher than preset highest temp limit (Sv + alarming temp allowance).
AL-L	Lower Temp. than lowest Temp. tolerance	Temp. Is lower than preset lowest temp limit (Sv - alarming temp allowance)

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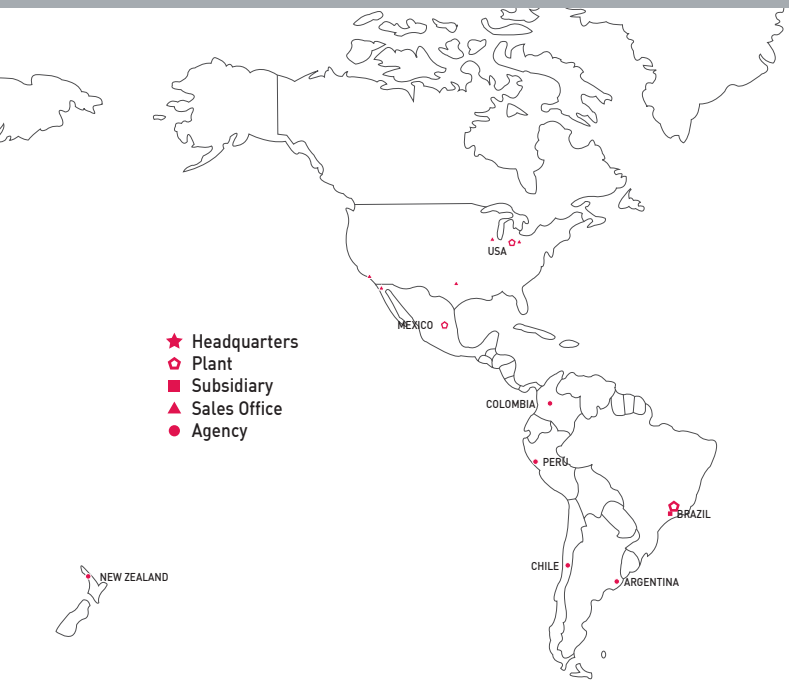

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