

Micro processor controller (For 800)

MF 108/MF408/MF508/MF708/MF908

INSTRUCTION MANUAL

MF08-800-E1

Please read this manual carefully and keep this manual for further reference

Features

- LCD three color VA display, bar graphic, output percentage MV1/MV2 or feedback MVfb display
- 0.2% measuring accuracy, maximum resolution 0.1 for TC and RTD input
- Output: relay, SSR drive, analog, triac, re-transmission
- Alarm: AL1/AL2 relay output, excitation, non-excitation, delay output, alarm lock function
Alarm mode: PV, deviation, absolute, band, alarm standby, PV deviation alarm ramp start-up alarm, ramp end alarm, Loop break alarm, heater break alarm
- Control mode: PID with auto-tuning, on/off, heating or cooling, heating+cooling, 3 wires proportional valve control, valve control with feedback signal, output restrain
- Program version: PID mode, ramp up mode, temp constant mode, soft-start
- Add-on feature: auto/manual control, run/stop function, even SV input
- Special features: all parameters distributed in three levels, parameters can be manually designate to different level
- Communication: RS-485, modbus-RTU, pattern 8-(N,0,E)-(1,2)
- Ambient temp 0-50°C, humidity 0-80%RH

(11) Communication N: No Communication 5: Rs485 communication Modbus-RTU

(12) Aux power source

N: No auxpower

A: 24VDC isolated B: 24VDC grounded C: 12VDC isolated D: 12VDC grounded

E: 9VDC isolated F: 9VDC grounded G: 5VDC isolated H: 5VDC grounded

(13) Transmission [Op2 terminal output or Au3 output]

N: no transmission A: 4-20mA(OP2) B: 0-20mA(OP2) C: 0-5VDC(OP2) D: 1-5VDC(OP2)

E: 0-10VDC(OP2) F: 4-20mA(AU3) G: 0-20mA(AU3) H: 0-5VDC(AU3) J: 1-5VDC(AU3)

K: 0-10VDC(AU3)

(14) INPUT2 for position feedback

N: no input2 A: 4-20mA B: 0-20mA C: 0-5V/resistance input for valve feedback D: 1-5V

(15) Remote SV setting(INPUT2 or INPUT3)

E: 0-10V

N: NO remote sv A: 4-20mA(INP2) B: 0-20mA(INP2) C: 0-5V(INP2) D: 1-5V(INP2)

E: 0-10V (INP2) F: 4-20mA(INP3) G: 0-20mA(INP3) H: 0-5V(INP3)

J: 1-5V(INP3) K: 0-10V(INP3) W: D1/D2 event input

(16) Manual output% remote setting (input2 or input3)

N: NO remote A: 4-20mA(INP2) B: 0-20mA(INP2) C: 0-5V(INP2) D: 1-5V(INP2)

E: 0-10V (INP2) F: 4-20mA(INP3) G: 0-20mA(INP3) H: 0-5V(INP3)

J: 1-5V(INP3) K: 0-10V(INP3)

2. Size and mounting

1: Model number and ordering information

Please check this ordering information and specify the code when order with us

Model	Item number (Panel size: width x height)	Dimensions
MF108	(48mmX48mm)	48mm x 48mm
MF408	(48mmX96mm)	48mm x 96mm
MF508	(96mmX48mm)	96mm x 48mm
MF708	(72mmX72mm)	72mm x 72mm
MF908	(96mmX96mm)	96mm x 96mm

CODE

□ □ - □ □ □ □ - □ □ * □ □ □ - □ □ - □ □ □ □
 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16)

(1) Power supply

B: AC85~265V D: DC24V

(2) Controller type

U: Standard PID type T: Temperature constant mode(with timer) R: Ramp and soak mode(with timer)

(3) Control action

F: ReversePID action (for Heating) D: Direct PID action (for cooling)

W: Heat/cool double PID action B: ON/OFF control (for heating)

M: ON/OFF control (for cooling)

(4) Input type, (5) Range code: See "15.INPUT RANGE TABLE"

(6) First control output [OP1] (or valve open)

N: No action

M: Relay contact V: Voltage pulse(for SSR)

2: Current(DC0~20mA) 8: Current(DC4 ~ 20 mA)

5: 0~5VDC 6: 0~10VDC

7: 1~5VDC T: Triac single phase zero crossing control

A: Relay output for motor valve open action

(7) Second control output [Op2] (Double PID Cool-side output or valve close)

N: No action

M: Relaycontact V: Voltage pulse(for SSR)

2: Current(DC0~20mA) 8: Current(DC4 ~ 20 mA)

5: 0~5VDC 6: 0~10VDC

7: 1~5VDC T: Triac single phase zero crossing control

A: Relay output for motor valve close action

(8) Alarm 1[AU1], (9) Alarm 2[AU2]

A: Deviation high alarm B: Deviation low alarm

C: Deviation high/low alarm D: Deviation band alarm

E: Deviation high alarm with hold action F: Deviation low alarm with hold action

G: Deviation high/low alarm with hold action M: Deviation band alarm with hold action

H: Process high alarm J: Process low alarm

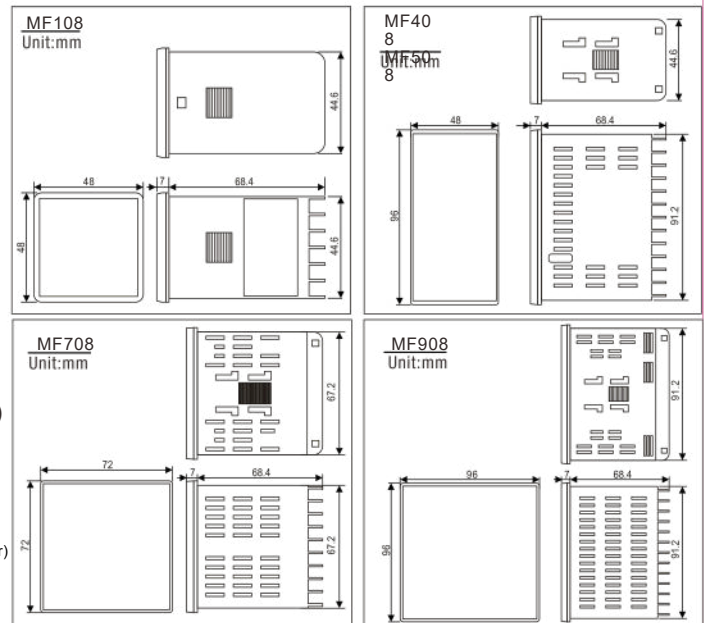
K: Process high alarm with hold action L: Process low alarm with hold action

V: SV high alarm W: SV low alarm P: PV value over flow alarm

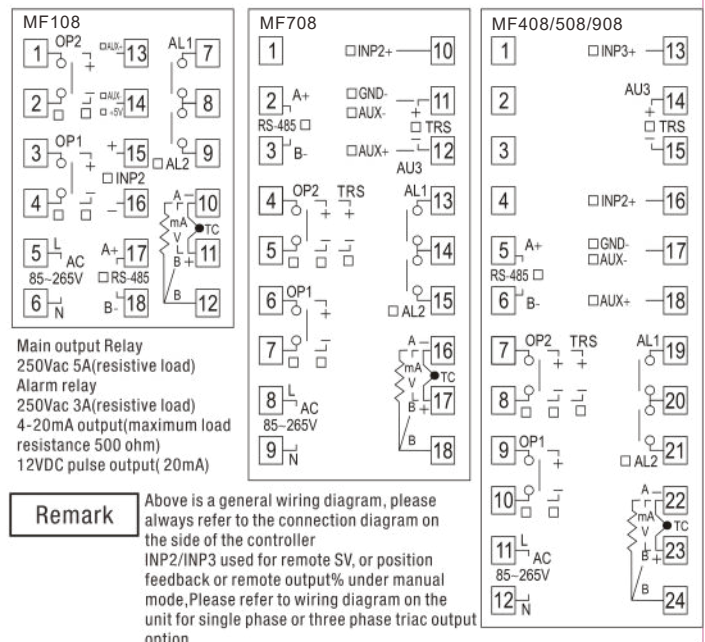
3: Timer kick-in alarm 4: Timer finish alarm R: LBA loop break alarm

Q: Heater short circuit alarm (HBA)

(10) Remark code: N



3. Wiring diagram



4. Panel description



PV window: display PV and parameter notation
 SV window: display SV and parameter value
 Bar graphic: indicate output%, feedback value or re-transmission value

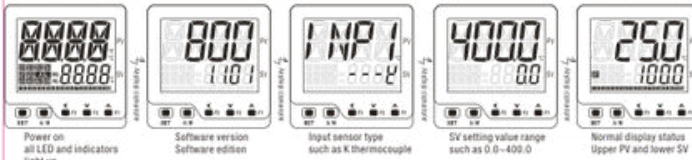
OP1: Indicate OP1 status
 OP2: Indicate OP2 status
 ATU: Indicate auto-tuning status
 AU1: AL1 alarm status
 AU2: AL2 alarm status
 AU3: Reserved light
 MAN: Manual control/soft-start indication
 COM: Communication indication
 PRG: Temp constant mode indication
 Ramp and soak indication

SET: Main function key
 A/M: Auto/manual switch key and enter key
 ◀: Shift key(F3 function key, such as ATU fast initiated or go back to previous parameter)
 ▼: Numeric decrease(F2 function key)
 ▲: Numeric increase(F1 function key, Run/Stop)
 SV1: Event input SV1 indication
 SV2: Event input SV2 indication
 SV3: Event input SV3 indication
 SV4: Event input SV4 indication
 SV1 and SV2 light together indicate remote-SV

5. Setting and programming

5.1 Power on initialization

Power on stage shows the software version and edition, input type and setting value range



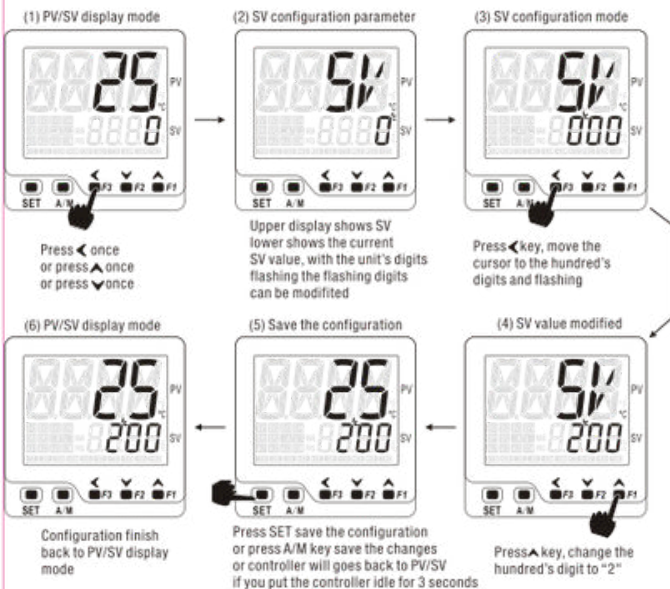
Notation	K	E	J	N	Wu3_Re25	S	t
Sensor type	K	E	J	N	Wu3_Re25	S	t
Range	-15 to 1300°C 0 to 2600°F	-15 to 800°C 0 to 1560°F	-15 to 1000°C 0 to 1950°F	-15 to 1300°C 0 to 2600°F	0 to 2200°C 0 to 3276°F	0 to 1600°C 0 to 3000°F	-15 to 400°C 0 to 782°F

Notation	r	b	AN1	AN2	F3	F4	Pt
Sensor type	r	b	DC0-50mV	DC10-50mV	Reserved	Reserved	Pt100
Range	0 to 1769°C 0 to 3216°F	0 to 1800°C 0 to 3276°F	-1999 to 9999	-1999 to 9999	Reserved	Reserved	-199 to 800°C -326 to 1472°F

5.1 SV configuration and parameter configuration

5.2.1 How to change the SV setting value, use the short cut key.

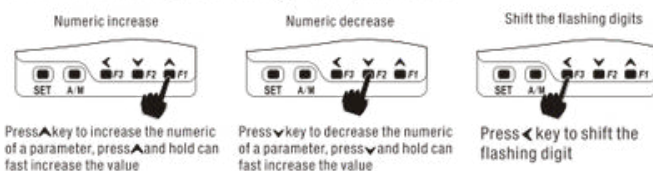
For example: change the SV from 0 to 200°C



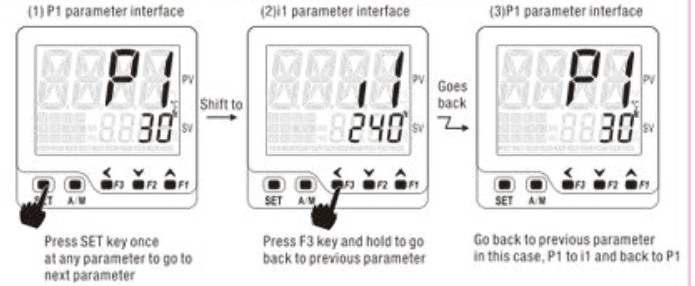
Remark 1: SV setting parameter can be assigned to different parameter menus, refer to S.F00 parameter for details

Remark 2: SV remote setting details, refer to "10. SV remote setting for more information"

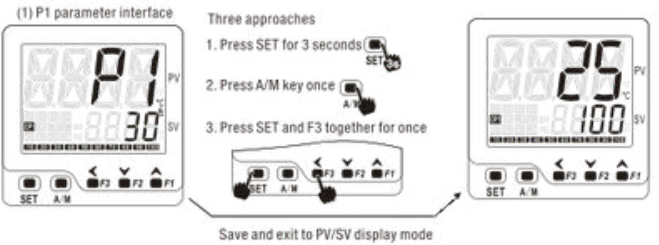
5.2.2 How to configure all configurable parameters



5.2.3 Shift between parameters and go back to previous parameter



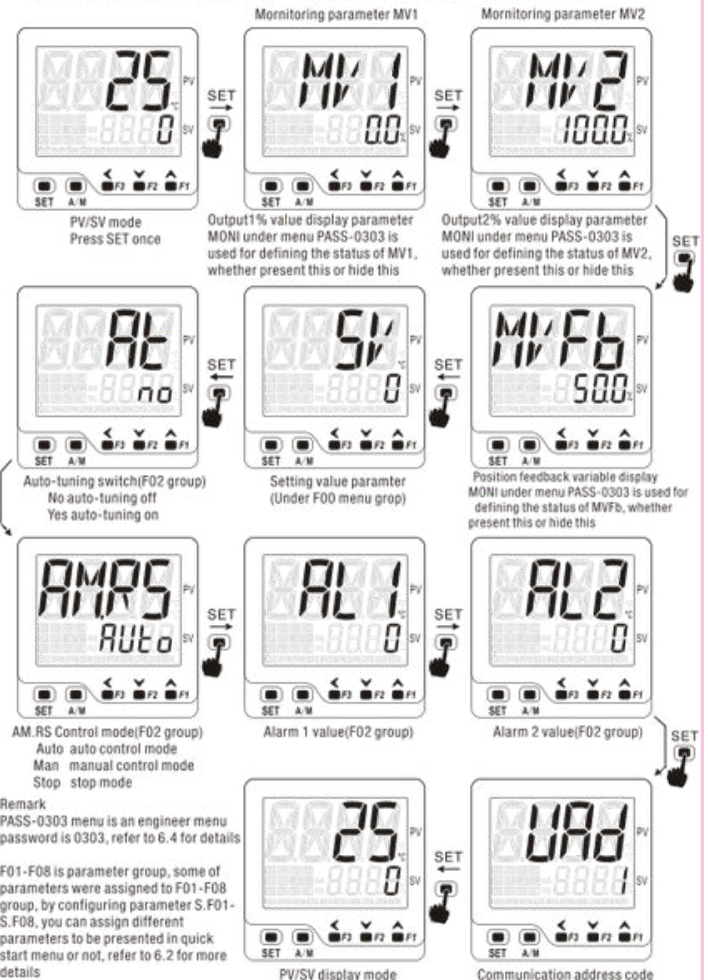
5.2.4 Save configuration and go back to normal PV/SV display mode



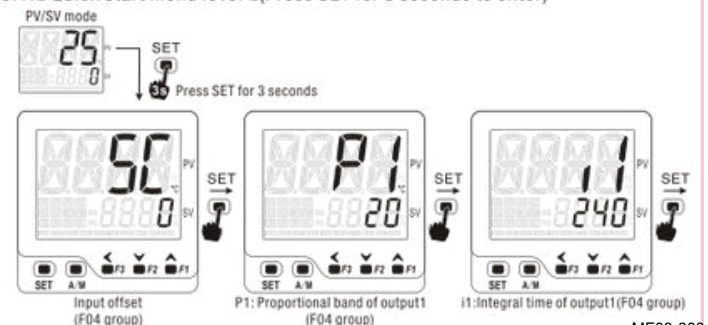
6. Parameter menu

6.1 Factory default parameter menu

6.1.1 Quick start menu level 1 (Press SET once to enter this menu)



6.1.2 Quick start menu level 2 (Press SET for 3 seconds to enter)



6.2 Basic functional parameter menu(F menu)

Navigation: Press SET and F3 key once, goes to password interface. Press SET and F3 key once, goes to password interface. Set PASS=0033 enter into F menu. F00 menu, press F1 or F2 key to shift between F00-F08.

Parameters shown in the grid:

- d1: Derivative time of output1 (F04 group)
- ATVL: Auto-tuning offset (F04 group)
- CYT1: Control cycle time of output1(FT04 group)
- OP1: Minimum output of output 1 (FT04 group)
- RST1: P1 reset wind-up (FT04 group)
- HYS1: Hysteresis for output 1 (FT04 group)
- OPH1: Maximum output of output 1 (FT04 group)
- BUF1: Soft-start value for output 1 (FT04 group)
- PK01: Initial output value under power-on manual control mode (FT04 group)
- P2: Cooling output proportional band(FT04 group)
- GAP2: Cooling side SV off-set (FT04 group)
- oLAP: dual output heating and cooling overlap area(FT04 group)
- i2: Cooling output integral time(FT04 group)
- d2: Cooling output derivative time(FT04 group)
- CYT2: Cooling output control cycle time(FT04 group)
- OP2: Output 2 minimum output (FT04 group)
- RST2: Output 2 PID reset wind-up (FT04 group)
- HYS2: Output 2 ON/OFF control hysteresis(FT04 group)
- OPH2: Output 2 maximum output (FT04 group)
- LCK: Parameter access protection quick start menu level 3 password (F08 group)
- SC: Back to first parameter

PV/SV display mode → Password interface → F00 menu interface

Press SET and F3 key once, goes to password interface. Set PASS=0033 enter into F menu. F00 menu, press F1 or F2 key to shift between F00-F08.

Notation	Name	Description	Default
SV	setting value	Range defined by(LSPL to USPL)	0
SF00	define the status of F00 group parameters	0: Do not present F00 under quick start menu Press F1, F2, F3 to SV setting mode 1: Present F00 at quick start menu level 1 2: Present F00 at quick start menu level 2 3: Present F00 at quick start menu level 3	0

Notation	Name	Description	Default
SV1	Event input SV1	SV setting configured by external D1/D2 terminals SV1 D1: open D2: open, SV=SV1	1
SV2	Event input SV2	SV setting configured by external D1/D2 terminals SV2 D1: open D2: close, SV=SV2	2
SV3	Event input SV3	SV setting configured by external D1/D2 terminals SV3 D1: close D2: open, SV=SV3	3
SV4	Event input SV4	SV setting configured by external D1/D2 terminals SV4 D1: close D2: close, SV=SV4	4
SF01	define the status of F01 group parameters	0: Do not present in quick start menu 1: Present F00 at quick start menu level 1 2: Present F00 at quick start menu level 2 3: Present F00 at quick start menu level 3	0

Notation	Name	Description	Default
RE	AT Auto-tuning	No.: Auto-tuning off Yes: Auto-tuning on	no
AMRS	AM,RS Operating mode	Auto.: auto control mode MAN: manual control mode Stop: stop mode	Auto
AL1	Alarm 1 value	Alarm value for alarm 1, range -1999~9999	10
AL2	Alarm 2 value	Alarm value for alarm 2, range -1999~9999	10
UAD	Device address	Define device address in RS-485 system	1
SF02	define the status of F02 group parameters	0: Do not present in quick start menu 1: Present F00 at quick start menu level 1 2: Present F00 at quick start menu level 2 3: Present F00 at quick start menu level 3	1

Notation	Name	Description	Default
RAMP	Ramp Ramping up rate	Ramp rate under ramp up heating mode Unit is °C/minute	1
T1	timer range	t1 is a time duration for temperature constant mode or ramp up mode minutes or seconds, t1=0, temperature constant mode disabled parameter t1UN under PASS-0303 define the t1 unit	0
SF03	define the status of F03 group parameters	0: Do not present in quick start menu 1: Present F00 at quick start menu level 1 2: Present F00 at quick start menu level 2 3: Present F00 at quick start menu level 3	0

Notation	Name	Description	Default
SC	Input offset	Input offset, to compensate the error caused by sensor Range, for temp: -199~199, for analog, -1999 to 1999	0
P1	Proportional band of output 1	Proportional band of output 1, range 0-800 output 1 switch to ON/OFF control when P1=0, Hysteresis is HYS1	20
i1	integral time	Integral time of output 1, range 0-3600 seconds when i1=0, integral off	210
d1	Derivative time	Derivative time of output 1, range 0-3600 seconds When d1=0, derivative off	30
REVL	Auto-tuning SV offset	Shift the SV value lower to prevent large overshoot during auto-tuning process range -199~199	0
CYT1	Cycle time for output 1	cycle time for output 1, CYT1=20 seconds for relay CYT1=2 seconds, CYT1 not applicable for analog output	20
HYS1	Hysteresis for output 1	When P1=0, ON/OFF control, HYS1 0.1-900 Heating: OP1 stop PV>SV OP1 active when PV<SV-HYS1 Cooling: OP1 active when PV>SV+HYS1 OP1 stop PV<SV	0
RST1	Time proportional reset	When i1=0, d1=0, pure proportional control, RST1 is reset value Heating, out 1%=(SV+rst1-PV)/P1*100% Cooling, out 1%=(PV-SV-rst1)/P1*100% this used to suppress overshoot at start-up for PID control Heating, suppress more when rst 1 gets smaller Cooling, suppress more when rst 1 gets bigger range: -199~199	0
OP1	minimum output for out1	Minimum output value 0.0 to 100.0%	0.0
OPH1	maximum output for out1	Maximum output value 0.0 to 100.0%	100.0
BUF1	Output 1 restrain	Output restrain for analog output, output restriction, only applicable for analog output controller for example, if buf=5%, means the output changing ratio will be less than 5% per second	100.0
PK01	Initial output %	Define the output ratio when temperature configured as manual output after power on	100.0
oLAP	heating/cooling overlap	Heating/cooling overlap range 0-100, overlap area is (SV-oLAP)-(SV+oLAP)	2

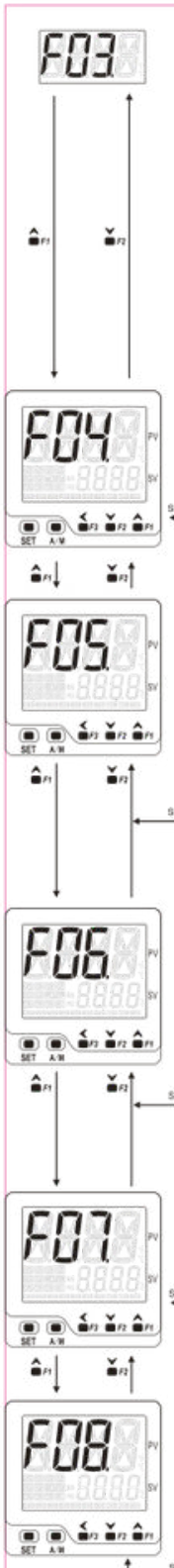
6.1.2 Quick start menu level 3(custom menu,access with password)

This is a customized menu, you can put those frequently used parameters which likely be accessed incorrectly manipulated under this menu, password is required if you want to access to this menu this will prevent unauthorized access and configuration

Lck: password to access menu level 3 Customized parameters, there is no parameters under this menu as factory default

LCK: quick start menu(F08)
S.F08 parameter defines the presence of this menu when LCK=0808, press SET key

Remark: F01-F06, parameters were distributed to these groups
S.F01-S.F06 used to define the presence of these parameter groups refer to "6.2 basic functional menu(F menu)" for more details



From the previous page

Notation	Name	Description	Default
GAP2	Cooling control SV offset	Define the cooling control SV value cooling control SV=SV+GAP2. Range: 0~200 For example, SV=100, GAP2=10 Then cool side SV=100+10	0
P2	P2 for cooling control	Proportional band for output 2, unit is degree range 0~800, P2=0 for ON/OFF control mode	20
I2	Integral time I2 for output 2	Integral time for output 2 range 0~3600 seconds I2=0 integral action off	210
d2	Derivative time for output 2	Derivative time for output 2 range 0~3600 seconds d2=0 derivative action off	30
CH2	Control period for output 2	Control period for output 2, 20 seconds for relay output, 2 seconds for SSR drive output	20
HYS2	Hysteresis for output 2	When P2=0, on/off control for out2.HYS2.range 0.1~900, OP2 active when PV>SV+GAP2+HYS2 OP2 stop when PV<SV+GAP2	0
RST2	time proportional reset, rSt2	When I2=0, d2=0, proportional control out2 %=(PV-SV-GAP2-rst2)/P2*100% suppress the overshoot after power on range:-199~199	0
OP2	Minimum output for out 2	Minimum output for output 2 range 0.0~100%	0.0
OPH2	Maximum output for out 2	Maximum output for output 2 range 0.0~100%	100.0
SF04	Define status of F04 group parameters	0: Absent 1: Present in quick start menu 1 2: Present in quick start menu 2 3: Present in quick start menu 3	2

F05 group parameters for controller with soft-start function only

Notation	Name	Description	Default
SFSV	Soft-start SV	SFSV range:-199~3275 SIME range: 0~100 minutes Sout range: 0.0~100.0%	0
SIME	Soft-start period	Soft-start function 1. Power on, heating control, if PV<SFSV, soft start active 2. Power on, cooling control, if PV>SFSV, soft start active 3. MAN indicator flashes, out% = "Sout" value 4. PID heating, when PV>SFSV or SIME time reached, soft-start off 5. PID cooling, when PV<SFSV or SIME time reached, soft-start off 6. MAN indicators off when soft-start terminated 7. SIME=0, soft-start function disabled	0.0
Sout	Soft-start out%	Soft-start function	0.0
SF05	Define status of F05 group parameters	0: Absent 1: Present in quick start menu 1 2: Present in quick start menu 2 3: Present in quick start menu 3	0

F06 group parameters for LBA(loop break alarm)and HBA(heater break alarm) only

Notation	Name	Description	Default
LBAE	LBA check time	Under heating mode(100% output),if the temperature did not increase LBA within LBA period, LBA will be triggered	80
LBAb	LBA temperature differential	Under cooling mode(100% output), if the temperature did not drop LAb within LbA period, LBA will be triggered	2
HBAE	Heater short circuit time	Under heating mode, if temperature increase HbAb within HbA period at output 0% HBA goes off	180
HBAb	Temperature differential	Under cooling mode, if temperature drops HbAb within HbA period at output 0% HBA goes off	10
SF06	Define status of F06 group parameters	0: Absent 1: Present in quick start menu 1 2: Present in quick start menu 2 3: Present in quick start menu 3	0

F07 group parameters

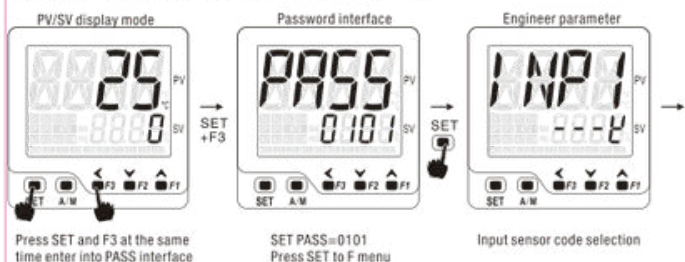
Notation	Name	Description	Default
1LR	ALM1 interlock	if alarm 1 interlocked, 1LR=1 put 1LR=0 can disengage the interlock	0
2LR	ALM2 interlock	if alarm 2 interlocked, 1LR=2 put 2LR=0 can disengage the interlock	0
SF07	Define status of F07 group parameters	0: no shortcut for interlock disengage 1: shortcut for interlock disengage available Press F1 and F2 at the same to quick access to 1LR and 2LR	0

F08 group parameters

Notation	Name	Description	Default
1Lk	Access protection and password for quick start menu 3	=0/1: all parameters can be modified =2: F06 group of parameters locked =3: F05,F06 parameters locked =4: F04,F05,F06 parameters locked =5: F03,F04,F05,F06 parameters locked =6: F02,F03,F04,F05,F06 parameters locked =7: F01,F02,F03,F04,F05,F06 parameters locked =8: F00,F01,F02,F03,F04,F05,F06 parameters locked =0000: Press SET to quick start menu 3	0
SF08	Define status of F08 group parameters	0: Absent 1: Present in quick start menu 1 2: Present in quick start menu 2 3: Present in quick start menu 3	2

- Three approaches to exist and save the configuration under F menu
- 1: Press SET key for 3 seconds
 - 2: Quick press A/M key once
 - 3: Press SET and F3 at the same time

6.2 Engineer parameter (PASS-0101 menu)



Depends on the specific functions some of parameter may or may not be available

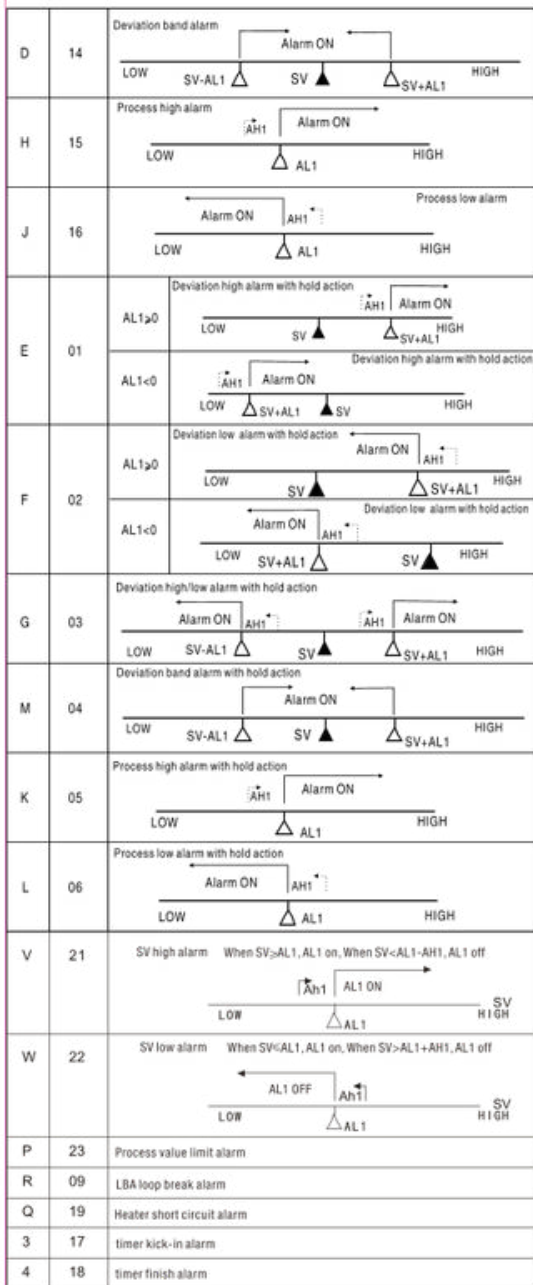
Notation	Name	Description	Default	Remark				
INP1	Input sensor code selection INP1							
	Symbol	K	E	J	N	W3_Re25	S	t
	input	-15 to 1300K 0 to 2600 °F	-15 to 800K 0 to 1560 °F	-15 to 1000K 0 to 1950 °F	-15 to 1300K 0 to 2300 °F	0 to 2200K 0 to 3900 °F	0 to 1800K 0 to 3240 °F	-15 to 400K 0 to 782 °F
	Symbol	r	b	AN1	AN2	AN3	AN4	PE
	input	r	b	DC0-50mV	DC10-50mV	DC200mA DC3-10V	DC200mA DC3-10V	PI100
	range	0 to 1769K 0 to 3216 °F	0 to 1800K 0 to 3276 °F	-1999 to 9999	-1999 to 9999	-1999 to 9999	-1999 to 9999	-199 to 800K -326 to 1472 °F
DP	Decimal point dP	0, 1, 2, 3	0	TC/RTD input, 0: without decimal point, 1: 1 decimal point Analog input: 0: without decimal point, 1: 1 decimal point, 2: 2 decimal points 3: 3 decimal points				
UNIT	Display unit UNIT	°C, °F, no	°C	°C: Celsius °F: Fahrenheit No: No unit				
LSPL	SV lower limit LSPL	Temp: -199~3275 Analog: -1999~9999	0	SV lower limit Remote-SV lower limit input display value				
USPL	SV higher limit USPL	Temp: -199~3275 Analog: -1999~9999	400	SV higher limit Remote-SV higher limit input display value				
PVOS	input offset PVOS	Temp: -199~199 Analog: -1999~9999	0	To compensate the input error caused by the sensor				
PVFE	Input filter strength PVF1	0 to 60	5	1-30 normal input filter strength 31-60 enhanced input filter strength				
ANL1	lower limit display for analog input	-1999~9999	0	Display for analog input at its lower limit value "ANL1"				
ANH1	higher limit display for analog input	-1999~9999	2000	Display for analog input at its higher limit value "ANH1"				
LRSL	Transmission output lower limit TRSL	-1999~9999	0	Display for re-transmission at its lower limit value				
LRSH	Transmission output lower limit TRSH	-1999~9999	400	Display for re-transmission at its higher limit value				
ALD1	Alarm mode for alarm 1	00 to 16	11	To configure the alarm mode of alarm 1				
AH1	Alarm hysteresis for alarm 1	0 to 9999	0	Hysteresis value for alarm 1				
ALD1	Alarm 1 delay time	0 to 9999 seconds	0	Alarm delay time for alarm 1 only applicable for ALD1=01~06 and 11~16, Alarm 1 will be triggered after delay time ALD1				
ALD2	Alarm mode for alarm 2	00 to 16	10	To configure the alarm mode of alarm 2				
AH2	Alarm hysteresis for alarm 2	0 to 9999	0	Hysteresis value for alarm 2				
ALD2	Alarm 2 delay time	0 to 9999 seconds	0	Alarm delay time for alarm 2 only applicable for ALD2=01~06 and 11~16, Alarm 2 will be triggered after delay time ALD2				
OUT1	OP1 output mode	0 or 1	0	0: reverse control(heating) 1: direct control(cooling)				
BER1	OP1 analog output restriction	0, 1, 2	0	0: output restriction off 1: output restriction on 2: output restriction on when output increase, restriction off when output decrease				
PUCY	motor valve travel time	0-200 s	60	This parameter assign the travel time for the motor valve means the time for the valve from full open to full close this is only application for motor valve without position feedback				
SSRM	Triac triggering mode	Std CYCL PHAS	PHAS	Std: SSR Drive output, zero-crossing trigger CYCL: Random trigger PHAS: Phase angled trigger				
PMd	Program execution mode	0, 1, 2	0	Only applicable for temp constant and ramp and soak mode 0: Standard mode 1: temp constant mode 2: ramp and soak mode				
TSP	TSP	0 to 9999	1	This parameter defines the temperature when the timer kicks in Temperature(TSP) for timer kicks in= SV-TSP when PV=SV-TSP and stay for 5 seconds then timer kicks in				
PENd	PENd	0, 1	1	=0: PID control off when timer finish =1: PID control goes on when timer finish power interruption or press F1 for 3 seconds will re-start				
IdNO	IdNO	0-255	1	Device address configuration				
bAUd	bAUd	2.4 4.8 9.6 19.2	9.6	2.4 Baud rate 2400 bps 4.8 Baud rate 4800 bps 9.6 Baud rate 9600 bps 19.2 Baud rate 19200 bps				
UCR	UCR	N,O,E	N	N: 8 data bit, + No parity+1 stop bit(8N1) O: 8 data bit, + odd parity+1 stop bit(8O1) E: 8 data bit, + Even parity+1 stop bit(8E1)				

Alarm mode(ALD_n=00~16)

- | | | |
|------------------------------|--|------------------------------------|
| 10: No alarm | 00: No alarm | 09: LBA alarm |
| 11: Deviation high alarm | 01: Deviation high alarm with standby function | 19: HBA heater short circuit alarm |
| 12: Deviation low alarm | 02: Deviation low alarm with standby function | 17: Timer kick-in alarm |
| 13: Deviation high/low alarm | 03: Deviation high/low alarm with standby function | 18: Timer finish alarm |
| 14: Deviation band alarm | 04: Deviation band alarm with standby function | 21: Setting value high alarm |
| 15: Process high alarm | 05: Process high alarm with standby function | 22: Setting value low alarm |
| 16: Process low alarm | 06: Process low alarm with standby function | 23: Process value limit value |

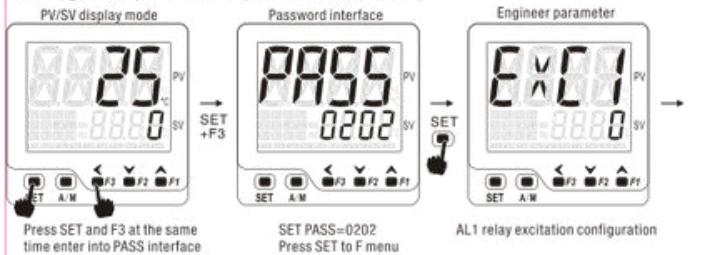
6.2.1 Alarm mode details

Code	ALD	Specification(Example for alarm 1)
A	10 or 00	No alarm
	11	Deviation high alarm LOW SV HIGH SV+AL1 AH1 Alarm ON
B	12	Deviation low alarm LOW SV HIGH SV+AL1 AH1 Alarm ON
	13	Deviation high/low alarm LOW SV+AL1 SV HIGH SV+AL1 AH1 Alarm ON



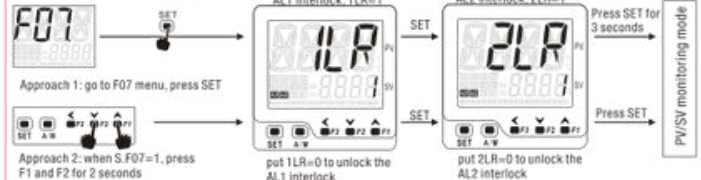
Note: The alarm action will be suppressed right after power on even the condition is satisfied, and the alarm standby on works 1 time right after power on, the alarm will go off if the condition satisfied again after suppression at the first time

6.3 Engineer parameter (PASS-0202 menu)

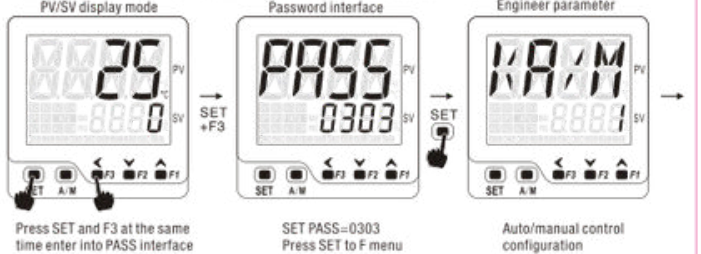


Notation	Name	Range	Default	Remark
$E \times 01$	AL1 relay excitation	0,1	0	0:AL1 relay pull-in when alarm 1 triggered 1:AL1 relay release when alarm 1 triggered
$A \times 11$	AL1 interlock	0,1	0	0:AL1 output standard mode 1:AL1 output interlock mode
$E \times 02$	AL2 relay excitation	0,1	0	0:AL2 relay pull-in when alarm 2 triggered 1:AL2 relay release when alarm 2 triggered
$A \times 12$	AL2 interlock	0,1	0	0:AL2 output standard mode 1:AL2 output interlock mode

6.3.1 Alarm interlock disengaged procedure



6.4 Engineer parameter menu 3 (PASS-0303 menu)

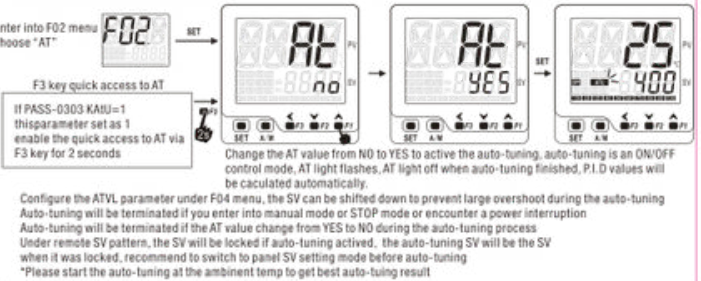


Depends on the specific functions some of parameter may or may not be available

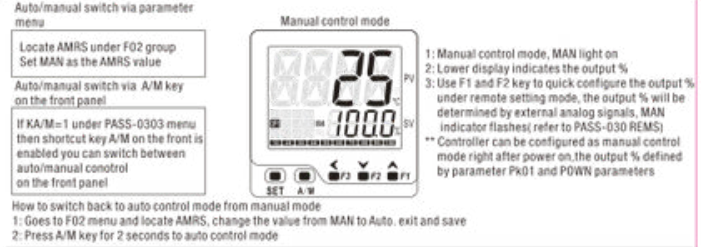
Notation	Name	Range	Factory default	Remark
$K \times M$	Auto/manual control switch configuration	0,1	1	0: A/M key disabled 1: A/M Key enable (press A/M key 3 seconds to switch)
$K \times S$	Run/Stop function configuration	0,1	0	0: Disable RUN function active by F1 key 1: Enable RUN function active by F1 key 0: Disable STOP function active by F2 key 1: Enable STOP function active by F2 key
$K \times L U$	Auto-tuning short cut key	0,1	0	0: Disable auto-tuning active by F3 key 1: Enable auto-tuning active by F3 key
$P \times W O N$	Power on control mode	0,1,2,3	0	0: Auto control mode after power on 1: Stop mode after power on 2: Manual control mode after power on 3: Controller continue the status from where it left off
$S F S E$	soft-start function configuration	0,1	0	0: Disable soft-start function 1: Enable soft-start function
$T R S$	Re-transmission configuration	0,1	0	0: PV re-transmission 1: SV re-transmission
$P F F b k$	Position feedback configuration	0,1	0	0: Position feedback disabled 1: Position feedback enable for close loop control
$R E S V$	Remote SV	0,1	0	0: Remote SV off 1: Remote SV on (panel SV setting off) 2: Remote SV on (panel SV setting on)
$M o N I$	Quick start menu 1 configuration	0,1,2,3	1	0: MV1, MV2, MVFb absent in quick menu 1 1: MV1, MV2, present in quick menu 1, MVFb absent 2: MVFb present in quick menu 1, MV1, MV2 absent 3: MV1, MV2, MVFb present in quick menu 1
$B E A R M$	Bar graphic display configuration	0,1,2,3	0	0: Bargraphic for OP1 % 1: Bargraphic for OP2 % 2: Bargraphic for TRS % 3: Bargraphic for MVFb %
$T U N$	Timer unit	0,1	0	0: Timer unit "second" 1: Timer unit "minute"
$R E M S$	manual output % remote setting	0,1	0	0: Manual output % set via key pad 1: Manual output % set via remote signal

Three approaches to exist and save the configuration under F menu
1: Press SET key for 3 seconds
2: Quick press A/M key once
3: Press SET and F3 at the same time

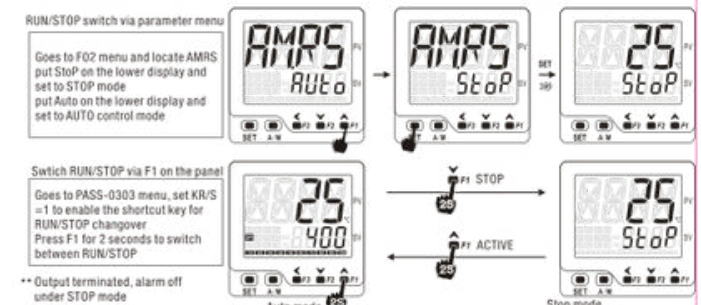
7. Auto-Tuning



8. Auto manual control switch

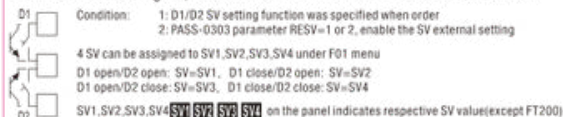


9. RUN/STOP function

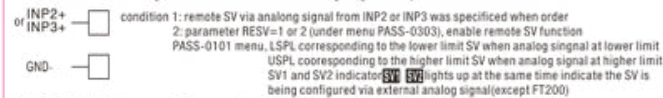


10. SV Panel setting and remote setting

10.1 Remote setting SV, use D1/D2 terminals at the back to set the SV

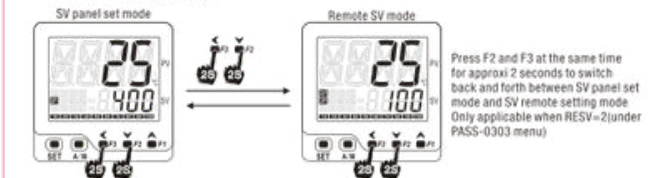


10.2 Remote setting SV via external analog signal input from INP2 or INP3



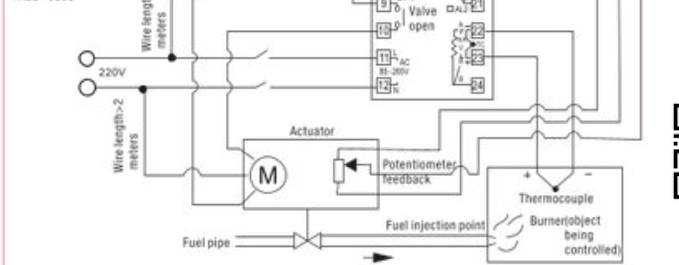
10.3 Switch between SV remote setting and SV panel setting

Goes to PASS-0303 and set RESV=2, quick switch between remote SV setting and panel SV setting enabled, enter into remote SV mode after power on



11. Three wires motor valve control

This is only available for valve control version of controller please specify if you need position feedback or not when order with us. output: OP1 for valve direct acting (open), OP2 for valve reverse acting (close), make sure to put the motor valve on the intermediate relay or AC contractors. You can also go to PASS-0303 and set PFBK=0 and switch off the position feedback function in case you've already ordered a controller with position feedback feature, the motor valve travel time must be specified via tUCY parameter under PASS-0101 menu in a no position feedback case. Quick start menu parameter MVFB is a monitoring parameter for the valve feedback value, this can be configured via parameter MoNI under PASS-0303, the bargraphic can also be used to indicate the feedback value, this can be configured via bEAM under PASS=0303



12. Position feedback calibration and operation

Condition
1: Position analog feedback via terminal INP2 ordered (only applicable for 3 wires motor valve or analog output controller)
2: PFBK=1, position feedback enabled for close loop control
General feedback signal, 1) standard analog signal, 2) Potentiometer feedback signal, specify when order



Auto calibration on the position feedback



1. 3 wires motor valve auto calibration
Upper shows AA2L, OP2 light on, OP2 relay pull-in, motor reverse act, lower display changes along with the motor reverse act, display switch to one at right after some while, "0" point calibration finished
2. Analog output controller
upper shows AA2L, OP1 output at 0% value, lower display changes along with the feedback signal, display switch to the one at right after some while, "0" calibration finished

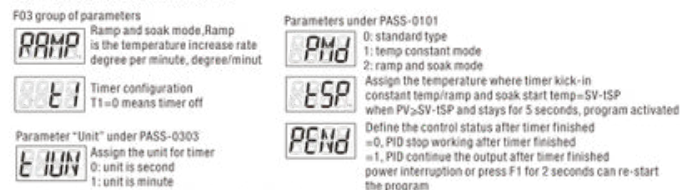
1. Upper shows AA2H, OP1 light on
OP1 relay pull-in, valve direct act lower display changes along with the direct act, display switch to the right one after some while, calibration finished
2. for analog output, upper shows AA2H, OP1 output 100%, lower display changes along with the valve feedback signal, display changes to the right after some while, process finished

Calibration finish, goes back to PV/SV mode, these process always carried out automatically, user shall only observe the lower display changes, MVFB can be used to monitor the feedback value, MoNI under PASS-0303 used to define the status of MVFB
Bargraphic % display can be used to shows the feedback %, bEAM under PASS-0303 used to define the status of the bargraphic display

13. Temp constant mode and ramp/soak mode

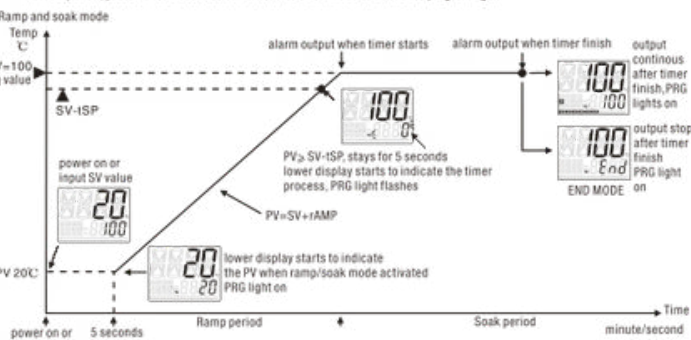
This is only applicable for programmable version of controller. specify when order

13.1 Parameters that involved



13.2 Ramp and soak mode detailed working flow chart PMd=2

1. program execute: power-on, lower display shows SV, this will delay 5 seconds before the program starts, PRG lights on during the ramp and soak process, lower display starts to indicate the PV value, PV increase gradually based on the preset ramp up rate towards to SV value
2. Timer kick-in: When PV > SV-ISP for at 5 seconds, timer kick-in, lower display shows the timer, PRG flashes, timer range is t1 value, timer starts alarm and timer finish alarm can be configured, refer to PASS-0101 ALd1 and ALd2
3. Timer finish: when timer finish, PRG light on, based on PEND parameter under PASS-0101, output can be configured as continue working or stop, when alarm mode=18, alarm will be triggered after timer finish
4. program terminated: if PEND=0 configured, program ends after timer finish, lower display shows "End" main output off, press F1 for 2 seconds can enter into STOP mode or active the program again



13.3 Temp constant mode working flow chart PMd=1

1. Program activate: lower shows SV, and heatup towards SV immediately
2. Timer kick-in: when PV > SV-ISP, stays for 5 seconds, timer activated, lower display shows timing process, PRG flashes, timer range is t1 value, an alarm can go off when timers starts by configuring the ALd1 or ALd2=17 under PASS-0101
3. Timer finish: when timer finish, PRG light on, based on PEND parameter under PASS-0101, output can be configured as continue working or stop, when alarm mode=18, alarm will be triggered after timer finish
4. program terminated: if PEND=0 configured, program ends after timer finish, lower display shows "End" main output off, press F1 for 2 seconds can enter into STOP mode or active the program again



RS-485 communication brief

- (1) Communication based on modbus RTU, support 03 read command, 06 and 10 write command
- (2) Communication format, 2 wires system, half-duplex, single drop connection
- (3) Communication speed: 2400, 4800, 9600, 19200 baud rate, data format, 1 start bit+ 8 data bit+ parity (N.o.E)+1 1/2 stop bit
- (4) Support maximum 36 write command and 37 read command
- (5) Detailed setting goes to PASS-0101 and locate parameter Idn0, bAUD, UCR parameters
- (6) Refer to "COM-800-E1" for detailed communication protocol information

15. Input sensors and range

	Input type	Code		Input type	Code
K	0.0 to 200.0 °C	K D2	Pt100	0.0 to 100.0 °C	D D1
	0.0 to 400.0 °C	K D4		0.0 to 200.0 °C	D D2
	0 to 400 °C	K A4		-50.0 to 200.0 °C	D G2
	0 to 600 °C	K A6		-100.0 to +200.0 °C	D F2
	0 to 1300 °C	K B3		-199.9 to +200.0 °C	D F3
	0.0 to 200.0 °C	E D2		0 to 100 °C	D A1
E	0.0 to 300.0 °C	E D3	0 to 200 °C	D A2	
	0 to 200 °C	E A2	0 to 400 °C	D A4	
	0 to 400 °C	E A4	0 to 800 °C	D A8	
	0 to 800 °C	E A8	-100 to 200 °C	D C2	
	0.0 to 300.0 °C	J D3	-200 to 400 °C	D C4	
	0.0 to 400.0 °C	J D4	-200 to 800 °C	D C8	
J	0 to 300 °C	J A3	Input type		Code
	0 to 400 °C	J A4	AN1 0 to 50mV	-1999 to 9999	V 02
	0 to 1000 °C	J A10	AN2 10 to 50mV	-1999 to 9999	V 10
	0 to 300 °C	T D4	AN3 0 to 5VDC	-199.9 to 999.9	V 03
	0 to 400 °C	T A4	AN3 0 to 10VDC	-199.9 to 999.9	V 04
	0 to 1600 °C	S B6	AN4 1 to 5VDC	-19.99 to 99.99	V 08
T	0 to 1769 °C	R B8	AN4 2 to 10VDC	-19.99 to 99.99	V 09
	2.00 to 1800 °C	B B8	AN4 4 to 20mA	-1.999 to 9.999	A 03
	0 to 1300 °C	N B3	AN3 0 to 20mA		A 01
	600 to 2200 °C	WV B0	AN3 0 to 10mA		A 02

The accuracy is not guaranteed for type S thermocouple in the range of 0-100
Remark 1: user can switch input between thermocouple and RTDs via software
Remark 2: analog input except 0-50mA, 10-50mV needs to be specified when order

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