

General Features:

- \*Flagship product, LCD display PID temperature controller
- \*TC/RTD input by default, analog input needs to be specified when order
- \*Output field selectable(Relay+SSR Drive output)
- \*Parameter restoration to factory settings function
- \*1 alarm(Relay output) as standard, maximum 2 alarms available
- \*85~265Vac source or 24VDC/AC source
- \*Auto/manual control mode bumpless transfer
- \*Output bar graphic and digital display
- \*RS-485 Modbus communication optional
- \*Custom quick start menu, you can put parameter on the quick start menu for easy access and lock other parameters from unauthorized access
- \*RUN/STOP function from local controller or from master via RS-485
- \*Relay output for alarm can be configured from NO to NC or NC to NO
- \*Setting value minimum and maximum configurable, to prevent the setting value from being set at a dangerous value.
- \*Output minimum and maximum value configurable, the factory default output is 0%~100% you can configure the output for example at 30%~100%, by doing this, the output will be at least 30%
- \*The control mode of the controller right after power on can be set as auto control mode manual control mode, or STOP mode.
- \*When SV(setting value) of the controller configured via master device through RS-485, the SV can be stored in EEPROM or RAM
- \*The data format for communication can be configured as 8N1,8O1,8E1  
8 bytes for data, No parity, 1 stop byte(8,N,1)  
8 bytes for data, odd parity, 1 stop byte(8,O,1)  
8 bytes for data, Even parity, 1 stop byte(8,E,1)



Ordering Information

MODEL	FS108-820 (48mmX48mm)
Item Number(Panel Size:WidthXheight)	FS408-820 (48mmX96mm)
	FS708-820 (72mmX72mm)
	FS908-820 (96mmX96mm)

Function CODE														
□	U	-	□	□	□	-	U	N	*	□	□	N	-	□
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)				

- (1) Power supply  
B: AC85~265V D: DC24V
- (2) Fixed function code: U
- (3) Control method:  
F: Reverse control PID heating D: Direct control PID Cooling  
B: Reverse control ON/OFF heating M: Direct control ON/OFF cooling
- (4) Input Code (5) Setting value range(lower limit and upper limit)
- (6) Output Type  
U: Relay and SSR Drive built-in, output software selectable
- (7) Fixed code: N
- (8) Alarm 1 mode[AL1 terminal], (9) Alarm 2 mode[AL2 terminal] [Relay output for alarm]  
N: No alarm output  
A: Deviation high alarm  
B: Deviation low alarm  
C: Deviation band reverse alarm  
D: Deviation band alarm  
E: Deviation high alarm(with standby function)  
F: Deviation low alarm(with standby function)  
G: band reverse alarm(with standby function)  
H: Absolute value high alarm  
J: Absolute value low alarm  
K: Absolute value high alarm(with standby function)  
L: Absolute value low alarm(with standby function)  
M: Deviation band alarm(with standby function)  
V: Setting value high alarm  
W: Setting value low alarm  
P: Process value over range alarm  
R: Loop break alarm LBA  
Q: Heater break alarm HBA  
\*Remark: standby function only kicks-in one time right after power on
- (10) Reserved code: N
- (11) Communication  
N: Without communication 5: With RS-485 function

Technical Specifications

Input range and code table

Refer to this table to come up with the ordering code for position (4)and(5), please noted that this code only specify the factory default input and range, the input and range is configurable on site between TC/RTD, analog inputs needs to be specified before order, once the controller made with analog input, it will not support TC/RTD input vise versus

	Input Type		Code and range	
K	0.0 to 200.0 °C	K	D2	
	0.0 to 400.0 °C	K	D4	
	0 to 400 °C	K	A4	
	0 to 600 °C	K	A6	
	0 to 1200 °C	K	B2	
			E	D2
E	0.0 to 300.0 °C	E	D3	
	0 to 200 °C	E	A2	
	0 to 400 °C	E	A4	
	0 to 600 °C	E	A6	
	0.0 to 300.0 °C	J	D3	
	0.0 to 400.0 °C	J	D4	
J	0 to 300 °C	J	A3	
	0 to 400 °C	J	A4	
	0 to 1000 °C	J	A0	
T	0 to 300 °C	T	D4	
	0 to 400 °C	T	A4	
S **	0 to 1600 °C	S	B6	
R	0 to 1769 °C	R	B8	
B	200 to 1800 °C	B	B8	
N	0 to 1300 °C	N	B3	
Wu3_Re25	600 to 2200 °C	W	B0	
Pt100	0.0 to 100.0 °C	D	D1	
	0.0 to 200.0 °C	D	D2	
	-50.0 to 200.0 °C	D	G2	
	-100.0 to +200.0 °C	D	F2	
	-199.9 to +200.0 °C	D	F3	
	0 to 100 °C	D	A1	
Pt100	0 to 200 °C	D	A2	
	0 to 400 °C	D	A4	
	0 to 800 °C	D	A8	
	-100 to 200 °C	D	C2	
	-200 to 400 °C	D	C4	
	-200 to 500 °C	D	C5	
Input Type		Code and range		
AN1	0 to 50mV	V	02	
AN2	10 to 50mV	V	10	
AN3	0 to 5VDC	V	03	
AN3	0 to 10VDC	V	04	
AN4	1 to 5VDC	V	08	
AN4	2 to 10VDC	V	09	
AN4	4 to 20mA	A	03	
AN3	0 to 20mA	A	02	
AN3	0 to 10mA	A	01	

Ordering example: FS108-820-BU-FKA4-UN\*ANN-N

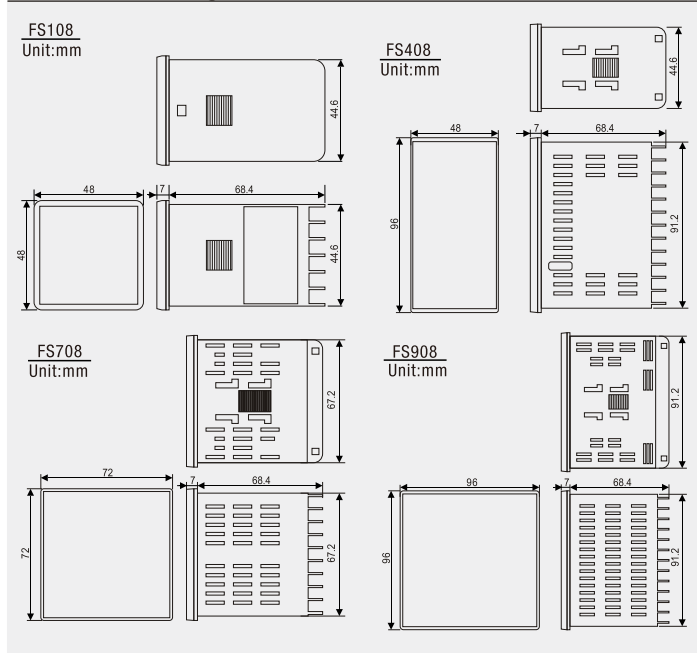
Main model

BU-FKA4-UN\*ANN-N

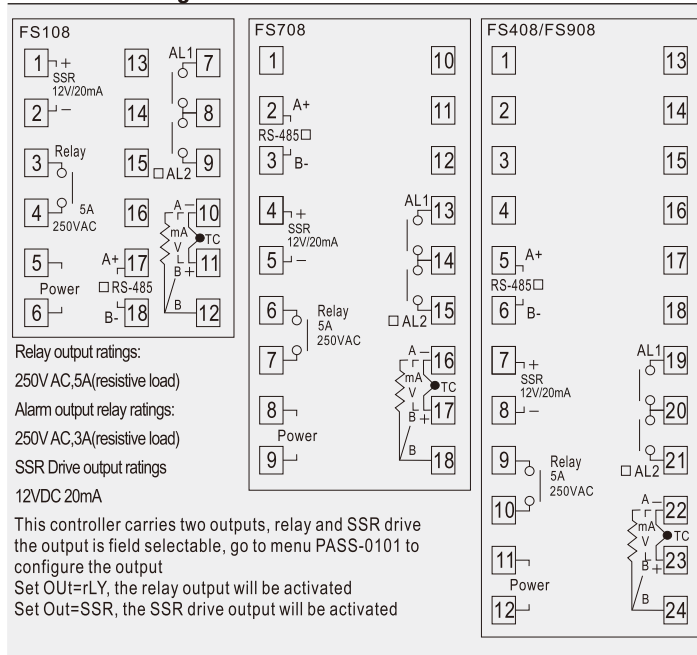


- Position (1): Code "B", power source, means 85~265Vac source
- Position (2): Code "U", version code, fixed code
- Position (3): Code "F", factory control method, means reverse control, for heating and PID control mode
- Position (4): Code "K", Input type, means thermocouple type K input
- Position (5): Code "A4", Setting value lower and higher limit, code "A4" means factory default range is 0-400 degree celcius
- Position (6): Code "U", means relay+SSR Drive output
- Position (7): Code "N", fixed code
- Position (8): Code "A", alarm 1 available, and configured as deviation high alarm
- Position (9): Code "N", alarm 2 not available
- Position (10): Code "N", fixed code
- Position (11): Code "N", without RS-485 communication

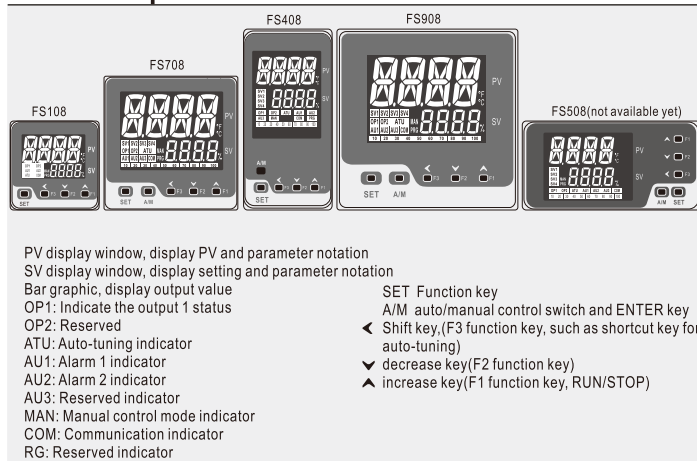
### Size and mounting



### Terminal arrangement



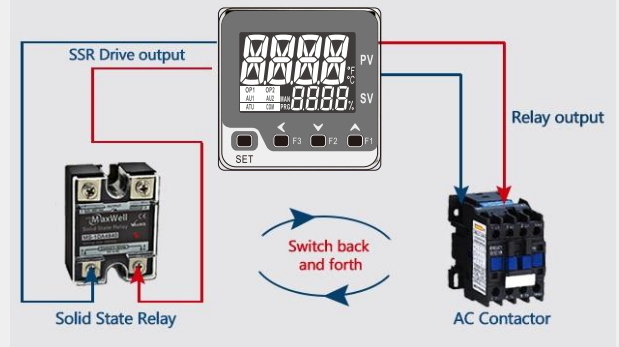
### Panel description



### Further elaborate on function of this controller

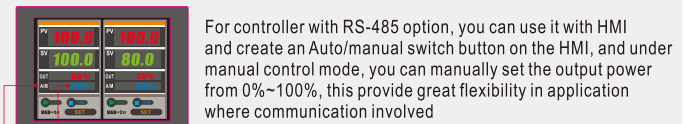
#### Relay or SSR Drive output field selectable

FS08 series Controller with built-in SSR Drive output and Relay output, if you want to use this controller to trigger a AC contractor or bigger load relay, select the Relay output, if you want to use this controller to trigger a solid state relay, select the SSR drive output



#### Auto/manual control bumpless transfer

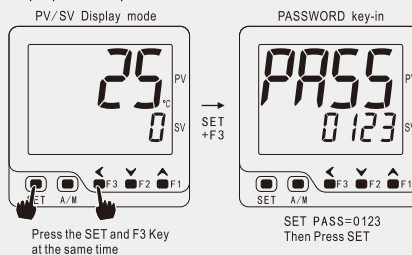
**A/M** Click A/M key on the front plate, you can switch from auto control mode to manual control mode, back and forth anytime you want, this is a very useful feature for application where the power needs to be manually controlled



Manually set the power from 0%~100% under manual control mode  
Auto/manual switch key on HMI for easy switch between auto/manual control mode

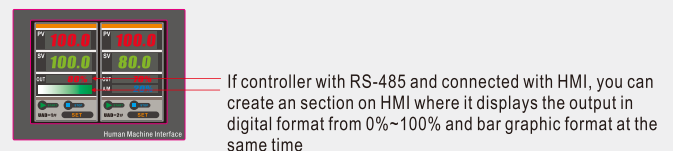
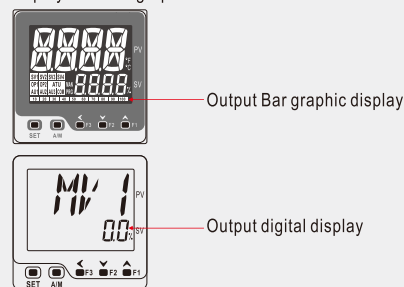
#### Parameter restore to factory settings

Controllers with a lot of parameters, some of end user get lost while programming the controller, this feature will reset some of parameters to factory default, this will help a lot to pinpoint the problem

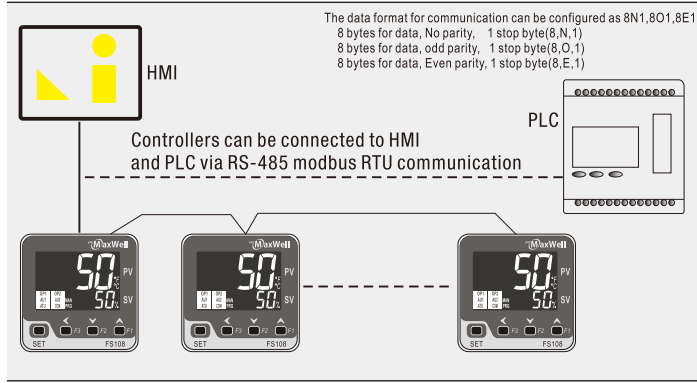


#### Output digital display and bar graphic display (except FS108)

The output of the controller can be displayed from 0%~100%, and at the same time, displayed as bar graphic

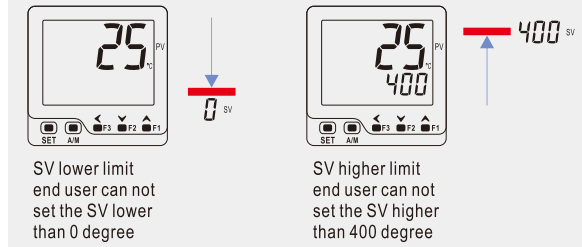


## RS-485 Modbus RTU communication



## Setting value(SV) lower limit and higher limit configurable

In any given temperature control application, the system is designed to withstand certain temperature range, over temperature is a dangerous scenario, one way to prevent this is to have a restriction range on the setting value, factory default is 0~400 degree, means the end user is not able to set the SV outside of the range. the range is field configurable.



The range is configurable, factory default is 0~400 degree

## Customized quick start menu for easy access and for access protection

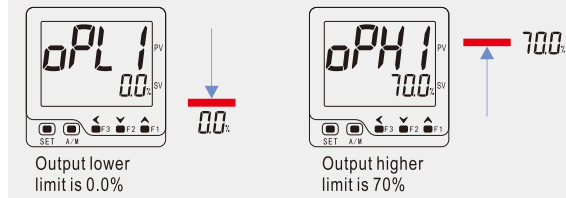
This controller has a lot of parameters, depends on the field application, customers might have to access some of parameters in a regular basis, while for some critical parameters the access can only be granted to authorized personal, the parameters of this controller has been assigned to different groups, F00 to F08 group, end user can assign these parameters from different group to quick start menu for quick access, and at the same time, lock some of parameters with password. this provides great flexibility on the programming process.

Notation	Name	Description	Default
SV	setting value 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
RR	Temperature increase rate RA	0~4 The larger the value, the faster the temperature rises	0
OLL	small output omit OLL	when output < OLL, the output will be terminated to protect the actuator(SSR/Relay/Contactor)	0
OHH	large output omit OHH	when output > (100%-OHH%), the output will be 100% to protect the actuator(SSR/Relay/Contactor)	0
SF01	Define the status of F01 groups parameters	0: Do not present in quick start menu 1: Present F01 at quick start menu 1 2: Present F01 at quick start menu 2 3: Present F01 at quick start menu 3	0

## Output lower limit and higher limit configurable(OPL/OPH)

Factory output is 0%~100% by default, under PID closed loop control system, the value of the output is calculated automatically by the controller, and it could be anywhere between 0%~100%, but if you set the output range as 0%~70%, then the minimum output will be 30% regardless of the PV and SV, an example, if the SV is 1000 degree, when you just turn on the system, the PV will be at ambient temperature, such as 23 degree, the output should be 100% by default, because the setting value(1000) is much higher than the process value(23), but the output will be only 70% since the OPH was configured as 70%



The range is configurable, factory default is 0%~100%

## RUN/STOP controller from local device and from master device via RS-485

RUN/STOP is a great feature, some application where the operator needs to stop the heating or cooling process, it's possible to press a shortcut key on the controller and then the heating/cooling process will be terminated. when controller connected to PLC or HMI, a RUN/STOP button can be created on the HMI,

RUN STOP

RUN/STOP button on HMI, you can run and stop the controller whenever you want.

## Alarm output(Relay) NO/NC programmable

