TAIE
www.fa-taie.com
www.fa-taie.com.tw

Modular Miniature

Digital PID Temperature / Process Controllers

FA200 FA211 Series

Brand-new feelings - new release

Gray & Black colors

External Operating Box KA601 is used in FA200 parameter setting

NEW CT HBA | NEW MODBUS | Programmable | Fuzzy | Autotuning

PAT.NO. : M347603
M347604
M348972 (Taiwan)
ZL200820301950.8
ZL200820301949.5
ZL200820301951.2 (China)

multinational patents

RoHS compliant CE

* Match to RoHS System

Modular Miniature DIN Rail installation single Loop

FA200 FA211 Temperature & Process Controllers

Industrial Innovation

FA200 Advance Type | **FA211 Economic Type**

Anit-traditional , Module Streamline style, Super-Miniature

- DIN RAIL, Magnetic seat, 3 installation ways, Flexibly match the requests of outside panel board for Panel Board.
- High Reliability Modbus communication, Easily connect with HMI and PLC
- Supply free of charge of monitoring software, it is very convenient for short distance operation to remote control & parameter copy.
- Additional Copy function, correspond to parameter setting for a considerable assembly, Avoid the mistake and save much time
- Small volume, multi pieces assembly side by side, composed of multi points & circuit controllers instead of single loop & point control.
- Down lift and transparent cover design, easily open and avoid mistaking touch & operation
- Directly use and correspond to universal voltage AC100~240V without connecting external DC power and can save the cost
- There are two colors deep black and light gray that can be selected

FA 200 Advance Type

- Plug in out terminal design is easy connection.
- External control box with double display has 7 segments display itself and can show PV value.
- New LED module design with 4 big digit display of PV & SV in control box is touched smoothly and can be plug in out and operate easily.
- The controller can be independently operated when the external control box is plug out from the controller After Parameter setting to prevent the man-made operating mistake.

External Control Box	Double display	Plug-in-out terminal

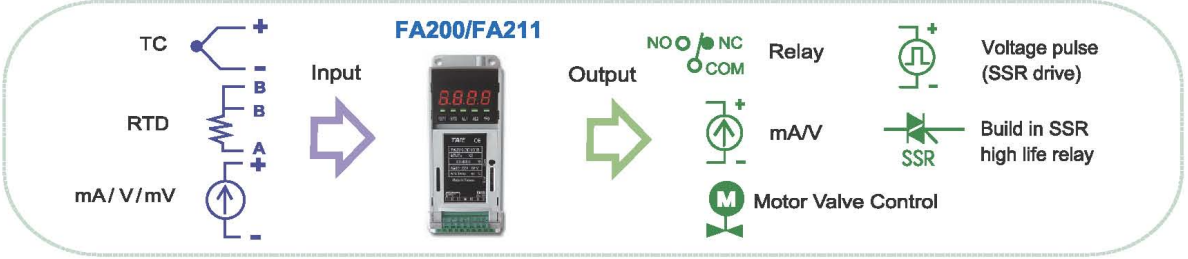
FA 211 Economic Type

- Reasonable prices, High reliability, replace traditional controllers, which should be need to hole to assemble.
- Single display design and keyboard operation directly.
- Down lift transparent cover design, Avoid mistaking touch & operation.

4 keys & single display	Fixed terminal

Multi-Option of input & output

- Completely correspond to any kinds of input signal like Thermo couple, RTD PT100, and DC4~20mA. 0~5V.etc.
- Satisfy any requests for output mode like DC4~20mA, 0~5V Voltage, Current & the relay output of capacity 8A
- Provides with 3 features of Controller, Signal converter and Alarm monitor. It can change the signal of mV, V, RTD to the output of Voltage & Current 4~20mA instead of the signal converter.
- Separately design for signal circuit and power circuit on PC board, effectively restrain the external interference of electric wave.



New-brand configuration design

● Achieve whole set of module & miniaturization 40x107x43mm light and compact, save the space of panel .

DIN RAIL Installation

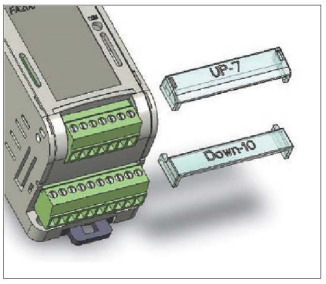
● Provided with two installing ways of Din Rail & Screw Lock, and suit for a Considerable quantities installation in the panel board. It is easy to install and take out controller itself.

5 pcs LED Indicator

● LED shows, alarm.control.output Watch the acts condition clearly

Design of separating secure cover for terminal

● Brand new design of secure cover for terminal with European standard
● Terminal with power does not expose external and feel artistic and security.

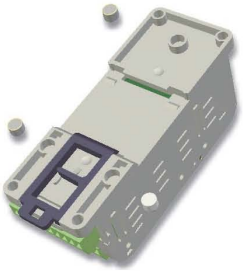


compact module assembly design

● Organization assembly.disassembles easily,extreme light.
● Provided the advance SMT manufacturing system,high quality and high reliability.

base attaches the magnetic place (use for FA200)

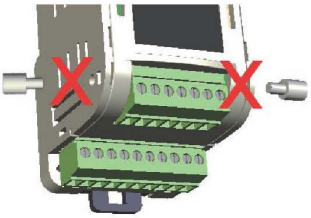
● Base attaches 3 magnets,may adsorb the made of iron box body willfully
● Don't need to worry about fix it problem,suitable in the short period testing or gauging.



Interval spacer design

Controllers can be installing side by side through using the attached round interval stick to keep a distance between controllers to increase and assure the efficiency of heat release and control if there are some heating equipments or the using ambient temperature is higher.

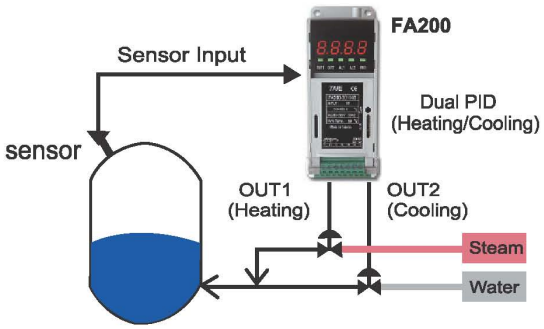
Plug in the round interval stick on the up half of both side is available.



Do not plug in the round interval spacer on the down half of both side, avoid the efficiency of compensating for normal temperature.

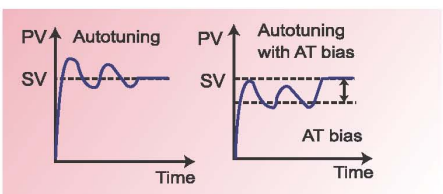
Optimize function

Heating and Cooling Control



PID autotuning control

It will make to calculate optimize PID value.

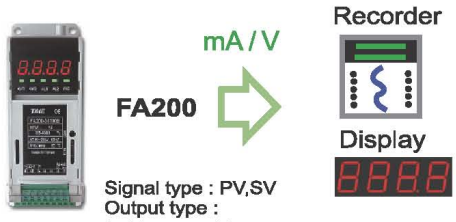


When autotuning acts ,it will make PV hunting 1~2 cycle to calculate optimize PID value. To protect user's device , FA series controller can perform PV hunting below SV by setting AT bias value(ATVL) .

Ultra intrepid.Option function

Transmission

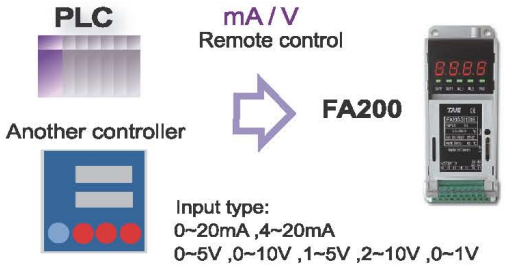
FA controllers can use this function to transmit the PV or SV value to external device.



Signal type : PV,SV
Output type :
0~20mA ,4~20mA
0~5V ,0~10V ,1~5V ,2~10V ,0~1V

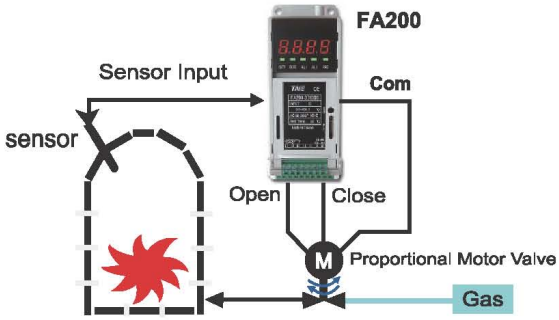
Remote SV

This function can use the external device to remote the FA controllers SV value.

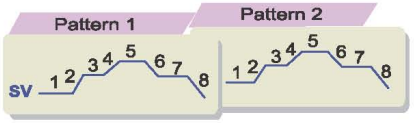


Input type:
0~20mA ,4~20mA
0~5V ,0~10V ,1~5V ,2~10V ,0~1V

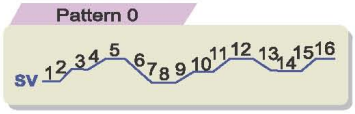
Motor Value Control



Ramp / Soak Program



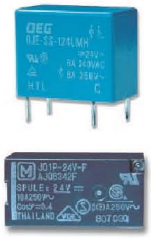
There are 2 patterns by 8 segments can be used in ramp/soak program.



There are 2 patterns can be linked together as16 segments in ramp/soak program.

Big capacity terminal design

RELAY
SPST terminal with 8A
SPDT terminal with 3A



SSR High life relay
Build in an additional high life of Relay (1A SSR), which is without terminal consumption, and suit for high frequency operation.

Maximum expanded

1 output 2 alarm or 2 output 1 alarm

Alarm Types

Alarm types list as below:

Deviation
- Deviation High Alarm
- Deviation Low Alarm
- Deviation High/Low Alarm
- Band Alarm

System
- System Failed Alarm
- System Normal Alarm
- Heater Break Alarm

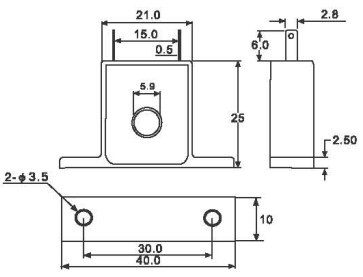
PV
- PV High Alarm
- PV Low Alarm

Program
- Program Run Alarm
- Program End Alarm
- Segment End Alarm

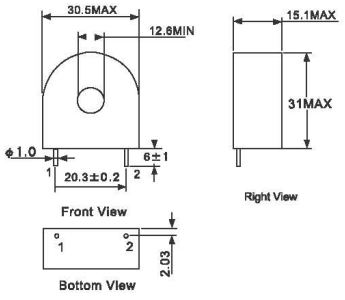
HBA - Heater Break Alarm

Corresponding to the function of HBA under 100A. Two CT of 50A and 100A are available
Current rated range: 0.0~99.9A, Accuracy: 1% FS, Alarm terminal: AL1
Attached accessory CT: SC-80-T (holing diameter: 5.8mm, 0.0~50.0A) or SC-100-T (holing diameter: 12mm, 0.0~99.9A)

CT 50A



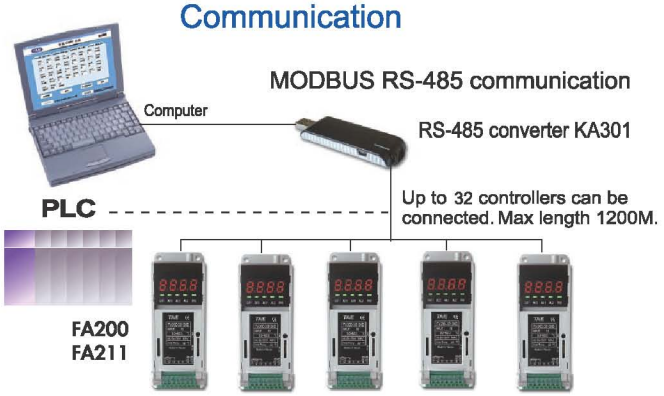
CT 100A



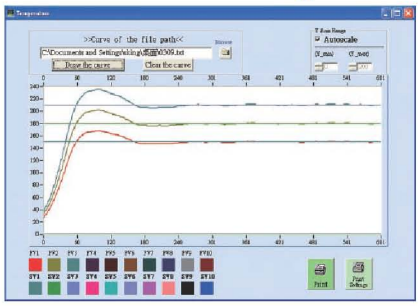
Super Communication function of MODBUS (RTU,ASC II, TAIE)

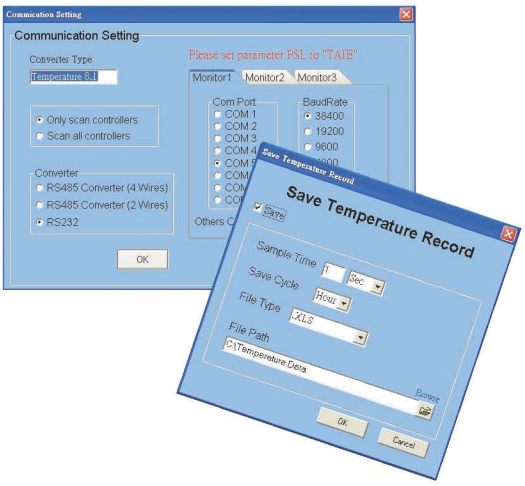
- It can be connected and controlled with any FA products which owned the communicated interface of MODBUS
- Easily connect HMI, PLC or connect PC monitor system
- To select the monitor mode by hour or day through MODBUS-RS485 communication software which TAIE supplied with free of charge
- All data can be saved in TXT or EXECL files
- All the saved data can be retrieved to use, and can be made as a reference of historical trend diagram

Communication



Historical trend diagram





New release

KA301 Universal Converter USB ↔ RS-485 / RS-422 / RS-232 / TTL

- KA301 USB Converter is suitable for various of industrial equipments such as PLC.HMI.Inverters .Temperature controllers which provided the communicated interface like › RS-485/RS-422/RS-232 &TTL to communicate and condrol with computer.
- KA301 provided 3 kind of converting connectors (KA502.KA504.KA503)and 3 kind of cables(CH-116.CH-117.CH-114)which are available for changing and extending use.

Parameter copy function by USB interface

- Using USB Converter (KA301) to communicate with PC, the data of master controller can be copied to another FA type controller.It can be saved a lot of time and avoid the parameter key-in mistake.
- KA301 USB communication converter uses DC5V power from computer. It can still copy the parameter even the controller without the power.

Monitor software for free

KA301 Converter (Option)

Front

Rear

connector

KA502 RS-485/422

KA504 RS-232

KA503 Extend

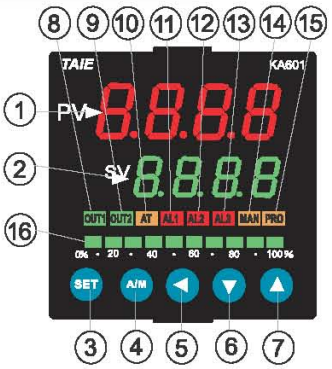
Cable

CH-116 RS-485/422/232

CH-117 FX PLC use Only

CH-114 Extend

KA601 External Operating Box



KA601 Dimension

SYMBOL		NAME	FUNCTION
PV	①	Measured value (PV)display	Displays PV or various parameter symbols (Red)
SV	②	Setting value(SV)display	Displays SV or various parameter values (Green)
SET	③	Set Key	Pressing "SET" key before and after setting or shifting parameters to call up or save the setting value.
A/M	④	Auto/Manual Key	Switching between Auto (PID) and Manual output mode.
<	⑤	Shift Key	Shifting digits when settings are changed
V	⑥	Down Key	Decrease the parameters or digit being modified *Program Hold 〈Only for programmable controller〉
Λ	⑦	Up Key (*Program Run)	Increase the parameters or digit being modified *Program run 〈Only for programmable controller〉
OUT1	⑧	OUT1 lamp	Lights when OUT1 is on (Green)
OUT2	⑨	OUT2 lamp	Lights when OUT2 is on (Green)
AT	⑩	Autotuning lamp	Lights when Auto tuning is activated (Orange)
AL1	⑪	Alarm1 lamp	Lights when Alarm 1 is activated (Red)
AL2	⑫	Alarm2 lamp	Lights when Alarm 2 is activated (Red)
AL3	⑬	Alarm3 lamp	Lights when Alarm 3 is activated (Red)
MAN	⑭	Manual output lamp	Lights when manual output is activated (Orange)
PRO	⑮	*Program Running lamp	*Flashes when program running (Only for programmable controller)
OUT1%	⑯	OUT% Bar-Graph display	Output % is corresponded to display on 10-dot LED

Alarm mode

▲ SV △ Alarm set value

01	Deviation high alarm with hold action* OFF / ON / LOW △ ▲ △ HIGH → PV
11	Deviation high alarm OFF / ON / LOW △ ▲ △ HIGH → PV
02	Deviation high alarm with hold action* ON / OFF / LOW △ ▲ △ HIGH → PV
12	Deviation low alarm ON / OFF / LOW △ ▲ △ HIGH → PV
03	Deviation high/low alarm with hold action* ON / OFF / ON / LOW △ ▲ △ HIGH → PV
13	Deviation high/low alarm ON / OFF / ON / LOW △ ▲ △ HIGH → PV

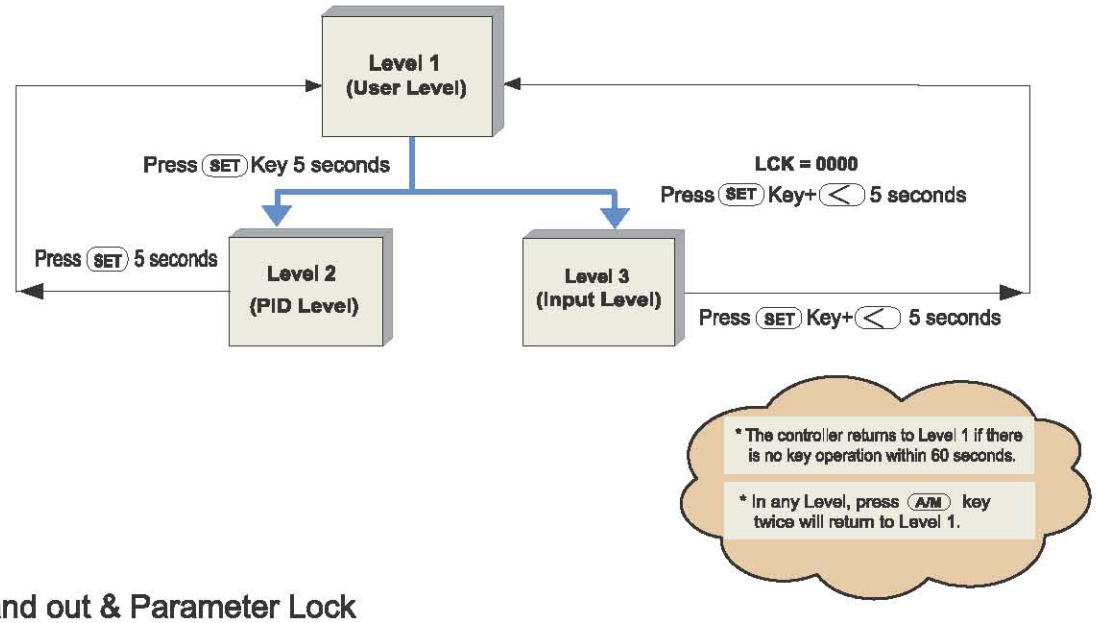
04 14	Band alarm OFF / ON / OFF / LOW △ ▲ △ HIGH → PV
05	Process high alarm with hold action* OFF / ON / LOW △ ▲ HIGH → PV
15	Process high alarm OFF / ON / LOW △ ▲ HIGH → PV
06	Process low alarm with hold action* ON / OFF / LOW △ ▲ HIGH → PV
16	Process low alarm ON / OFF / LOW △ ▲ HIGH → PV

07	Segment End alarm (Only for Programmable controller) (1)ALD1~3,set 07 (2)ALD1~3=Alarm Segment (3)ALD1~3 defines as follows: 0 = flicker alarm 99.59 = continued alarm others = alarm ON Delay time
17	Program Run alarm (Only for Programmable controller) Run / Stop ON / OFF AL
08	System failed alarm*(ON) Normal / Failed OFF / ON AL
18	System failed alarm*(OFF) Normal / Failed ON / OFF AL
09	Heater Break Alarm (HBA)
00 10	No alarm

* Hold action:
When Hold action is ON ,the alarm action is suppressed at start-up until the measured value(PV) enters the non-alarm range.
* System failed:
It means that the controller display error message with one of following : "UUU1"or"NNN1"or"CJCE"

Levels Explanation

Levels Diagram



Levels in and out & Parameter Lock

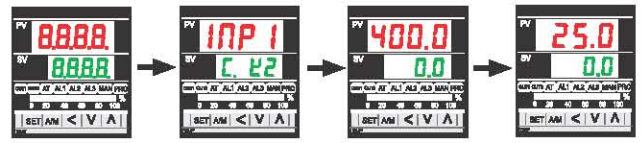
Please enter in level 2 (PID level) to set the parameter LCK which can be changed

LCK	Levels entering available			Parameters which can be changed
	Level 1 (User Level)	Level 2 (PID Level)	Level 3 (Input Level)	
0000	Yes	Yes	Yes	All parameters (Factory set value)
1111	Yes	Yes	No	
0100	Yes	Yes	No	
0110	Yes	Yes	No	Parameters in Level 1
0001	Yes	Yes	No	SV" and "LCK"
0101	Yes	Yes	No	Only "LCK"

Operations

1.Power ON:

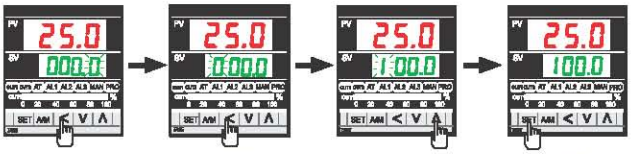
Controller will display as following



Light all LEDs and all 7 segment displays | Display Input type | Display range (0.0 ~ 400.0) | Ready for use

2.Change the Set Value(SV):

Change SV from 0.0 to 100.0



Press < Key: The SV number started to flash.The flashing digit indicates which digit can be set.

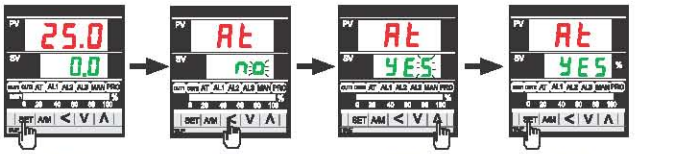
Press < Key: To select the hundreds digit.

Press ^ Key: To change the number to 1.

Press SET Key: To store the new set value.

3.Autotuning (AT):

Use AT function to automatically calculate and set the optimize PID value for your system.



Press SET Key: To display parameter AT.

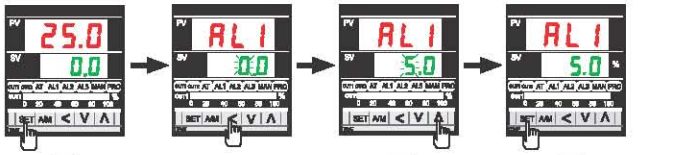
Press < Key: To change AT setting.

Press ^ Key: Change AT to " YES "

Press SET Key: Start Autotuning process (AT lamp will be lighted on)

4.Change the Alarm value:

Change AL1 value to"5.0"(AL1 active ,if PV exceeds SV over 5.0)



Press SET Key: To display parameter AL1

Press < Key: To change AL1 value

Press ^ Key: Increase AL1 value

Press SET Key: Store the new value of AL1

* There are total 16 alarm mode types ,referenced as below:
* To change Alarm mode, press SET + < key 5 seconds to enter Level 3(Input Level) and then change the value of ALD1/ALD2/ALD3.

Terminal Wiring Diagram

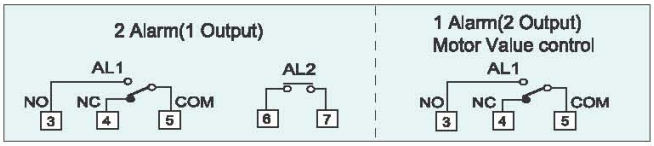
FA 200 Advance Type Plug-in-out Pitch 3.5 mm

A.Power 1 2

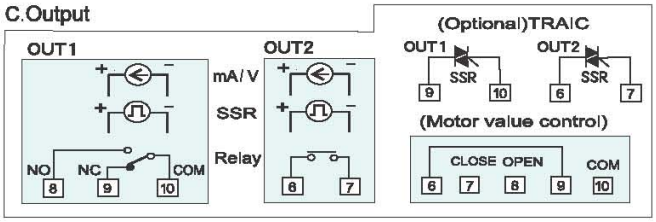
B.Alarm

1 2 3 4 5 6 7 8 9 10 Down layer

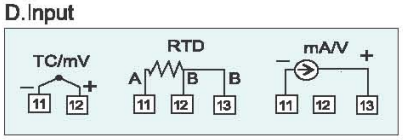
11 12 13 14 15 16 17 Up layer



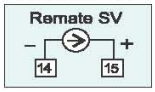
C.Output



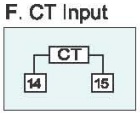
D.Input



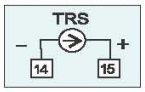
E.Remote SV



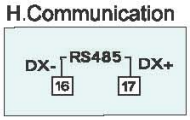
F. CT Input



G.Transmission



H.Communication



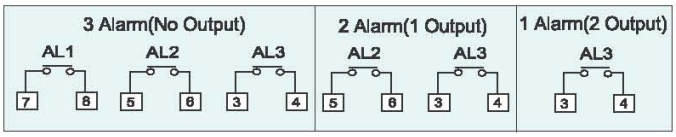
FA 211 Economic Type Fixed Pitch 5.0 mm

A.Power 1 2

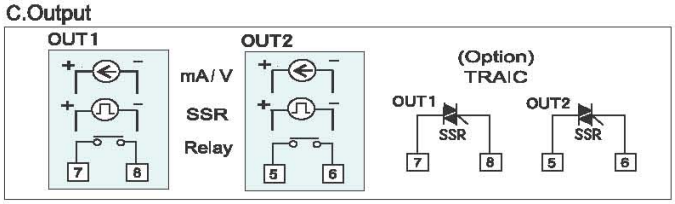
B.Alarm

1 2 3 4 5 6 7 8 Down layer

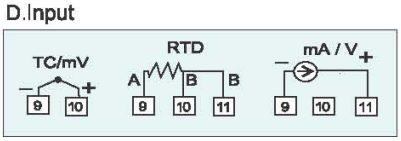
9 10 11 12 13 Up layer



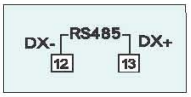
C.Output



D.Input



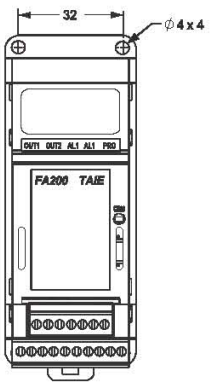
E.Communication



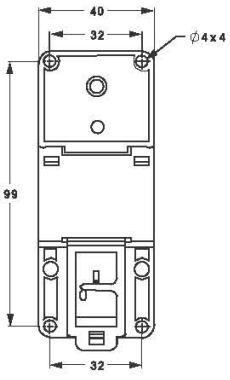
Outer Dimension

Unit:mm

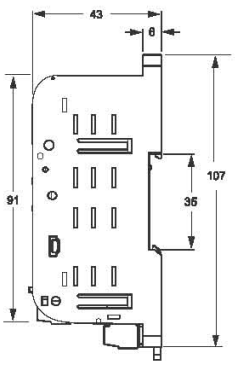
front drawing



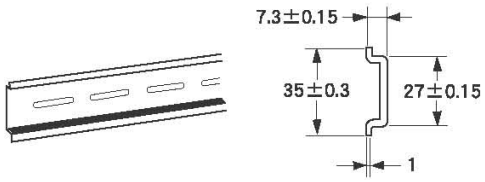
back drawing



side drawing



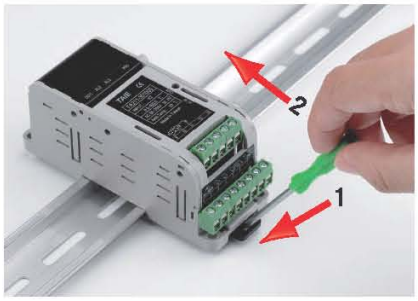
DIN rail Dimension (reference)



Assembly

When assembling, plug in FA200 on DIN rail and then lodge the bottom in easily.

When taking out of FA200, insert into the square hole on the bottom of FA200 with driver and put front and then it can be taken out from DIN rail.



⊙ Standard Spec.

Model		Advance Type FA200	Economic Type FA211
outer case color		two colors of deep black & light gray are available	
Wiring terminal		Plug in out terminal	fixed terminal
Parameter setting		by external control box or by communication	build in 4 operating keys or by communication
Assembly		DIN rail, M4 screw hole, magnetic seat	DIN rail or M4 screw hole
Display		External control box with double display + PV single display	single display
Standard accessories		1 Output + 1 Alarm	
maximum expansibility		1 Output + 2 Alarms or 2 Outputs + 1 Alarm	
additional option	programmable 2 patterns by 8 segments	Yes (Option)	YES (Option)
	High life SSR	Yes (Option)	YES (Option)
	communication	Yes (Option)	YES (Option)
	Motor Valve Control	Yes (Option)	No
	TRS	Yes (Option)	No
	Remote SV	Yes (Option)	No
	Heater Break Alarm (HBA)	Yes (Option)	No

⊙ General Spec.

Supply Voltage	AC 85-265V
Frequency	50 / 60 HZ
Power Consumption	Approx 4VA
Data Protection	EEPROM, Endurance : 1 Million write cycles, Data Retention : 10 years
Isolated resistance	main loop –case(ground) 、control loop – case(ground) DC500V > 10MΩ
Dielectric Strength	main loop –case(ground) AC 1500V 1min / control loop – case(ground) AC 1000V 1min
Vibration Endurance	10~55HZ 0.5mm (MAX 2G) XYZ various direction 2h
Assault Endurance	100m/s2 (Approx 10G) XYZ various direction 3 times
Protection Configuration	IP00
Display Height of Control box	LED Module PV : 14mm SV : 10mm / without control box
Display Height of single range LED	7 section digital display : 7mm
Dimension	40 x 107 x 43 mm
Weight	Appro x 115g
Operating Ambient temperature	0~50°C
Operating Ambient humidity	correspondent humidity 20-90% RH without dew
Reserved Temperature	-25°C ~ + 65°C

⊙ Control Features

Control method	Heating,Cooling single output or Heating & Cooling both output PID,PI,PD,P,ON/OFF(P=0), FUZZY
PID Parameter	P : 0.0 - 200.0% I : 0 ~3600 sec. D : 0 ~900 sec.
Control Cycle	0~150 sec.

⊙ Input Features

Input	the point of signal point	1 point
	Accuracy	0.2 % Full Scale ± 1digit
	Sample time	250 ms
	TC	K , J , R , S , B , E , N , T , W5Re/W26Re , PLII , U , L
	RTD	PT100 , JPT100
	mA (DC)	4-20mA , 0-20mA
	Voltage (DC)	0-1V , 0-5V , 0-10V , 1-5V , 2-10V, -10-10mV , 0-10mV , 0-20mV , 0-50mV , 10-50mV
	DP Position Option 0000 000.0 00.00 0.000	When using the input of sensor signal, DP position for PV can be selected the sensor code No. 1~ 52 When using the input of DC mA or Voltage, DP position for PV can be selected code No. 61 ~96 by DP Parameter.

⊙ Output Features

		Advance Type FA200	Economic Type FA211
Output 1	Relay	SPDT type (a point 8A, b point 3A 220V)	SPST type (1a point 8A 220V)
	for external SSR drive	ON : 24V , OFF : 0V, Max. load current 20mA	
	4-20mA / 0-20mA	Max. load resistance 560 Ω	
	0-5V , 0-10 V	Max. load current 20mA	
	SSR high life relay	1A TRIAC SSR (Option)	
Output 2	Relay	SPST type 8A 220V	
	for external SSR drive	ON : 24V , OFF : 0V , Max. load current 20mA	
	4-20mA / 0-20mA	Max. load resistance 560 Ω	
	0-5V , 0-10 V	Max. load current 20mA	
	High life relay	1A TRIAC SSR (Option)	

⊙ Communications

Interface	RS-485 two wires Half Duplex
Protocol	Modbus RTU 、Modbus ASCII 、TAIE
Data bit	8 bit
Start bit	1 bit
Stop bit	1 bit or 2 bit
Baud rate	38400 、19200 、9600 、4800 、2400 bps。
Error examine	Parity even 、odd or CRC-16 (in Modbus)
Connective pieces	Maximum 32 pcs
Communicate range	Maximum 1200 m

⊙ Alarms

Alarm 1 Relay	SPDT type (a point 8A, b point 3A 220V)	SPST type 1a point 8A 220V
Alarm 2 Relay	SPST type 8A 220V	
Alarm setting range	-1999~9999 (Dot positions are different depended on the various Input Types)	

Order Information

★ Factory basic value : FA200-101000-02A FA211-101000-02A

Model	Output 1	Output 2	Alarm	Transmission	Remote SV	Communication	Input Type	Power
FA 200 —	1	0	1	0	0	0	02	A

FA 200 — PFA 200 (Programmable) — Plug-in-out terminal (Advance Type)

FA 211 — PFA 211 (Programmable) — (Economic Type)

	Output 1	Output 2	Alarm	Transmission	Remote SV	Communication
0	None	None	None	None	None	None
1	(Relay)	(Relay)	1Set	4~20mA	4~20mA	RS-485 MODBUS
2	Voltge Pulse (SSR Drive)	Voltge Pulse (SSR Drive)	2Sets	0~20mA	0~20mA	
3	4~20mA	4~20mA				
4	0~20mA	0~20mA				
A	0~5V	0~5V	HBA	0~5V	0~5V	
B	0~10V	0~10V	HBA+AL2	0~10V	0~10V	
C	1~5V	1~5V		1~5V	1~5V	
D	2~10V	2~10V		2~10V	2~10V	
T	TRIAC (SSR)	TRIAC (SSR)				
7	Motor value control					

Input Type: See Input Codes

Power: A — AC 85~265V

★Above green blocks are optional functions with additonal agents.

★Factory set value K2, code 02

★TC Input(K. J.R.S.B.E.N.T.W.PLII.U.L...)setting, can be changed to any types by user

★RTD(JPT 100, PT100)setting, can be changed to any type by user

★TC, RTD, LINEAR can be changed each other but need to change the parts of hardware. For more details, please contact local agents.

Function Option

★ Maximum expand is 1 Output 2 Alarm or 2 Output 1 Alarm

★ "HBA" & "Remote" function can not be selected at the same time.

Type	RAMP/SOAK PROGRAM	Communication	★Output 1		★ Output 2	★ Alarm 2	HBA	Transmission	Remote SV
			Motor value control	TRIAC SSR					
FA 200	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FA 211	Yes	Yes	No	Yes	Yes	Yes	No	No	No

Input Types

Type	T C (Thermocouple)																														
	K						J						R		S		B	E		N		T			W		PLII		U			L	
Code	K1	K2	K3	K4	K5	K6	J1	J2	J3	J4	J5	J6	R1	R2	S1	S2	B1	E1	E2	N1	N2	T1	T2	T3	W1	W2	PL1	PL2	U1	U2	U3	L1	L2
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Rang e (°c)	2400 2300 2000 1900 1800 1700 1600 1500 1400 1300 1200 1100 1000 900 800 700 600 500 400 300 200 100 0 -100 -200																														

Type	R T D											
	JPT 100						PT 100					
Code	JP1	JP2	JP3	JP4	JP5	JP6	DP1	DP2	DP3	DP4	DP5	DP6
	41	42	43	44	45	46	47	48	49	50	51	52
Rang e (°c)	600 500 400 300 200 100 0 -100 -200											

Distributor

Type	LINEAR																
	AN1				AN2	AN3	AN4							AN5			
Code	61	62	63	64	71	76	81	82	83	84	85	86	87	91	92	93	94
Input Range	-10~10mV	-2~2V	-5~5V	-10~10V	0~10mV	0~20mV	0~50mV	0~20mA	0~1V	0~5V	0~10V	0~5KΩ	0~2V	10~50mV	4~20mA	1~5V	2~10V
Set Range	Four kinds of choices: -1999~9999 -199.9~999.9 -19.99~99.99 -1.999~9.999																