FY

Series Controller

FY400 · FY700
FY600 · FY800
FY900

Digital Process Controller

TAIE

台灣儀控股份有限公司
TAIWAN INSTRUMENT & CONTROL CO., LTD

De Facto Standard of Controller

High Performance Process Control

High Quality

Precise Control

High Reliability

Sampling Time 50ms

High Accuracy ±0.1%

Speed upper to 115200 bps

FY900

TAIE

Excellent Anti-Interference Ability

Passing the highest level of EMC verification in CE certification. It can resist electromagnetic interference in heavy noise environment.

Ultra Low Temperature Drift

Any operating conditions have been considered in the design, even if in temperature variety ambience, it also not affects PV and control performance.

High Speed Sampling And High Accuracy

Input can perform 50ms high-speed sampling, enabling stable control and response. Built-in 18-bit high resolution ADC circuit provides up to 0.1% accuracy.

Certification & Universal Voltage

All models are CE approval. Operate on any voltage from AC 85~265V at 50/60 Hz. DC 24V is also available.

Parameter Lock Function

All parameters are separated in four operation levels (Level1~Level4). Each parameter can be hidden or locked to prevent users unauthorized changes.

IP65 Proof

IP65 dust & water proof is available for all models.

Status Indicator Light

Real time monitor the status of output, alarm, auto-tuning, manual output and program execute.

OUT1 OUT2 AT AL1 AL2 AL3 MAN PRO
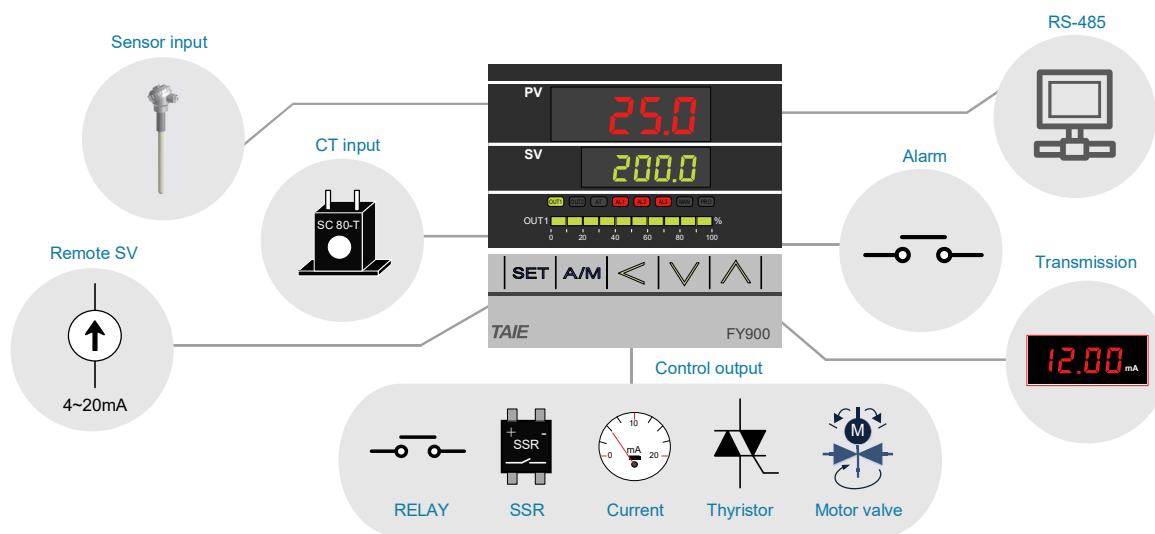
Bar-Graph

The output percentage is directly displayed on the panel with a bar-graph indicator 10 LED's corresponding to every 10% differential in output (0~100%) (except FY400).

OUT1   0 20 40 60 80 100 %

Function block diagram

Sensor input

CT input

RS-485

Alarm

Transmission

Remote SV

4~20mA

SC 80-T

PV 25.0
SV 200.0
OUT1 0 20 40 60 80 100 %
SET A/M < V A
TAIE   FY900

Control output

RELAY | SSR | Current | Thyristor | Motor valve

12.00 mA
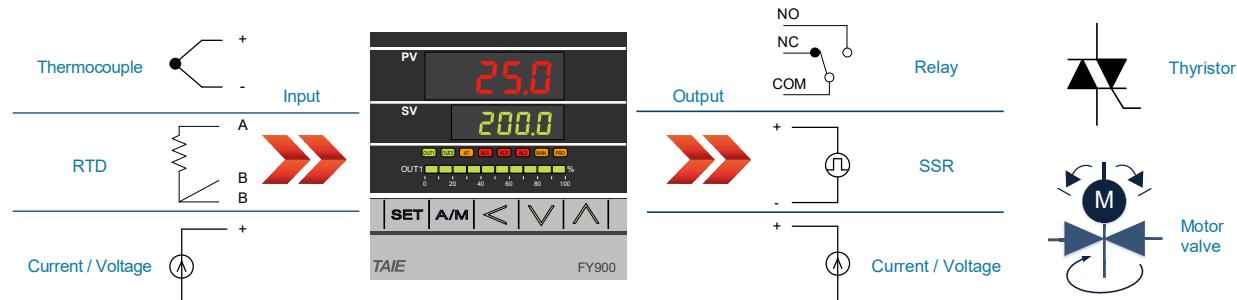
Features

Various I/O Types

Thermocouple + -

Input

RTD A B B

Current / Voltage + -

PV 25.0
SV 200.0
OUT1 0 20 40 60 80 100 %
SET A/M < V A
TAIE   FY900

Output

NO
NC
COM

Relay

+ -

SSR

Current / Voltage + -

Thyristor

Motor valve
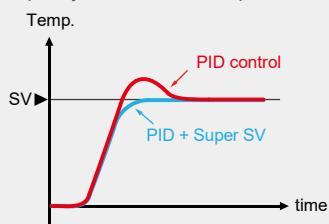
Excellent Control Performance
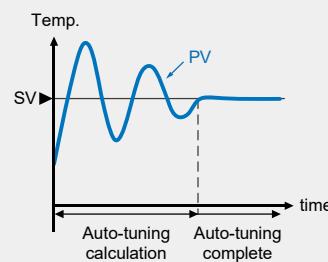
PID Control

Super SV function can effectively suppress temperature overshoot and quickly reach the set temperature.

Temp.

PID control

SV

PID + Super SV
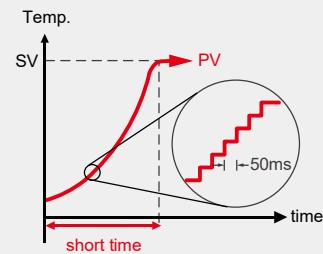
time

Auto-tuning

Calculate the optimal PID value of the system automatically, to achieve precise control effect.

Temp.

PV

SV

time

Auto-tuning calculation   Auto-tuning complete
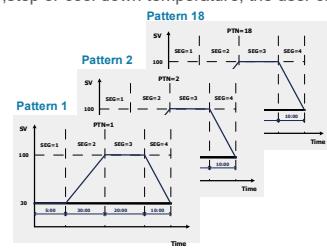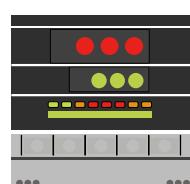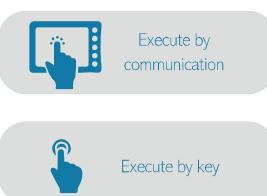
High speed control

50ms sampling time for fast and precise control of the occasion.

Temp.

SV

PV

50ms

short time

time

Powerful Program Control

Provides 18 patterns of 8 segments of program control, each segment can be arbitrarily set to ramp, soak ,step or cool down temperature, the user can be arbitrary according to the demand, the maximum can support to 144 segments program control.

Execute by communication

Execute by key

Pattern 18
Pattern 2
Pattern 1
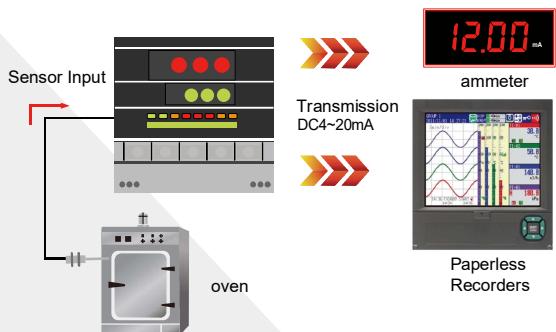
Features

Transmission

Transfer parameter digital values as analog signals to external devices.

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

parameters : PV, SV

Sensor Input

12.00 mA
ammeter

Transmission DC4~20mA

Paperless Recorders

oven
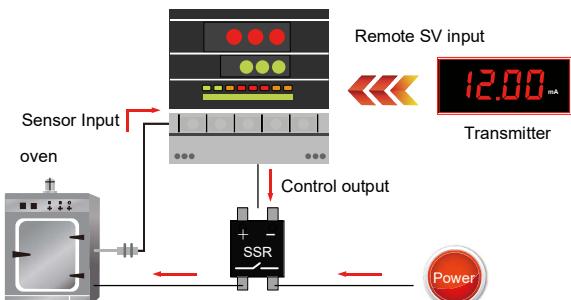
Remote SV

SV is controlled by an analog signal from an external device.

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

parameter : SV

Remote SV input

12.00 mA
Transmitter

Sensor Input

oven

Control output

SSR

Power
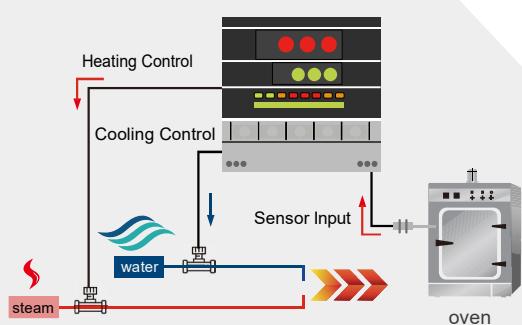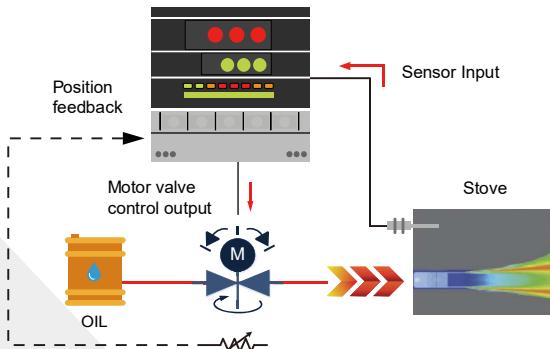
Heating and Cooling Control

Using two outputs of the controller, as long as a controller can control the heating / cooling equipment.

Heating Control

Cooling Control

Sensor Input

water

steam

oven
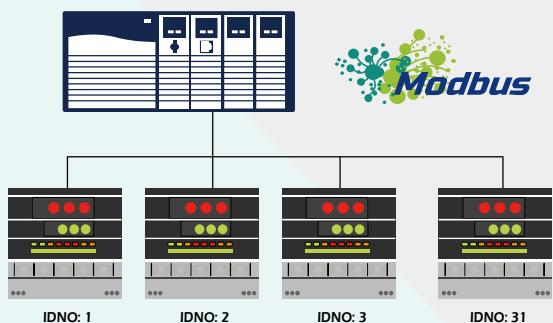
Motor Valve Control

Can use position feedback control of valve opening input or servo control without valve opening input.

Position feedback

Sensor Input

Motor valve control output

Stove

OIL
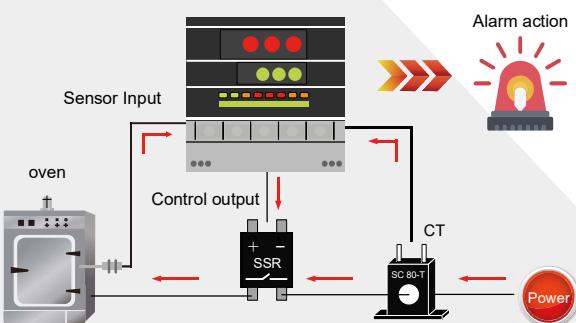
Communication

Compatible with Modbus RTU communication protocol to quickly establish links with HMI, PLC or SCADA software.

Modbus

IDNO: 1   IDNO: 2   IDNO: 3   IDNO: 31
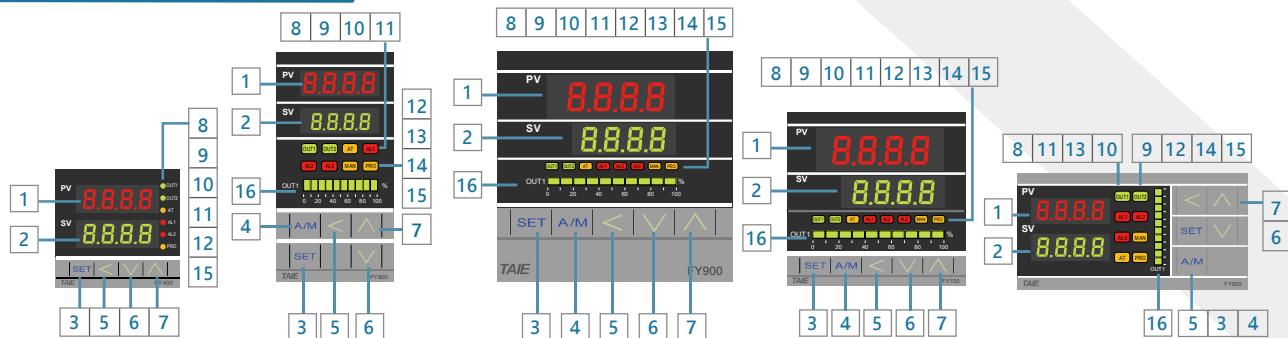
Heater Break Alarm(HBA)

With a CT (current transformer) to monitor the heater current in real time, when the current value is abnormally reduced an alarm signal can be output to notify the user.

Alarm action

Sensor Input

oven

Control output

SSR

CT

SC 80-T

Power
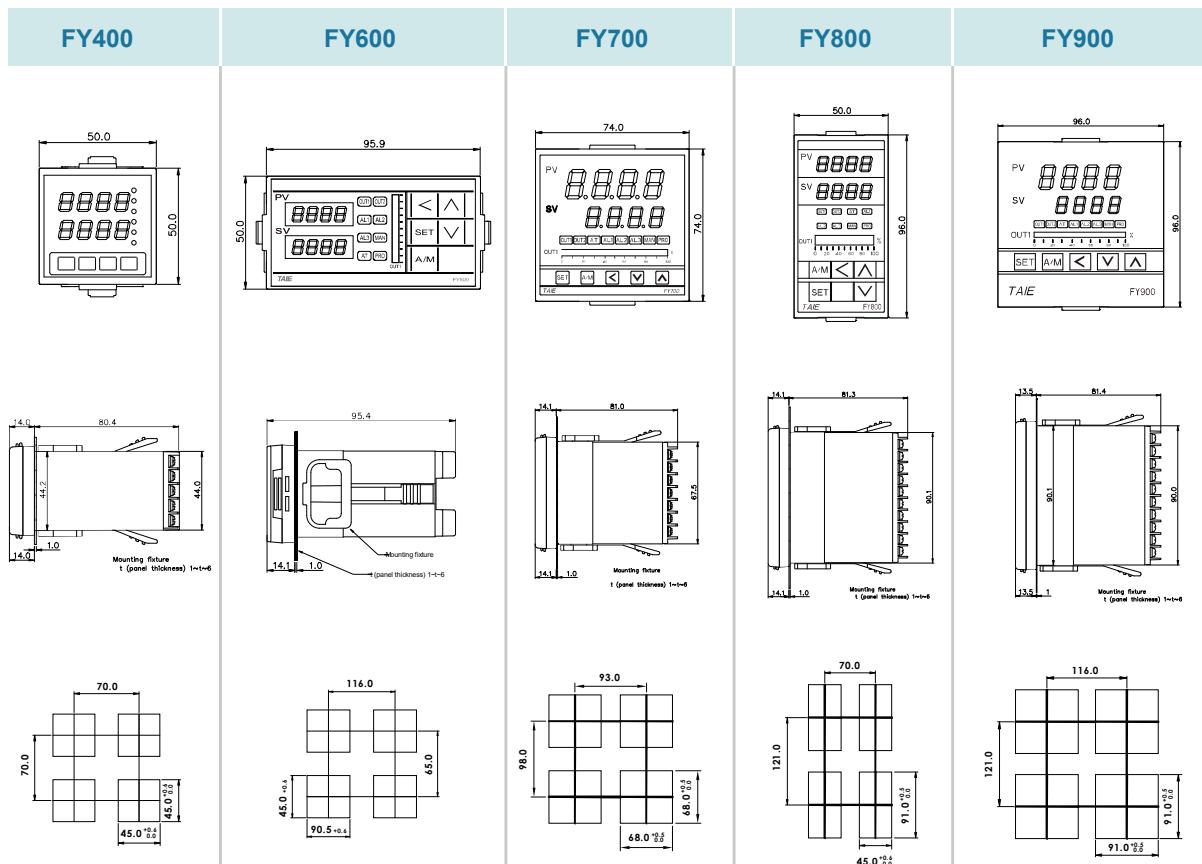
Appearance

Parts Description
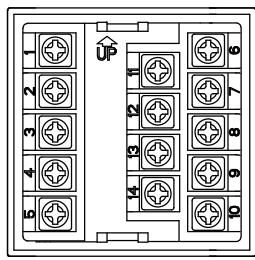
| NO.	NAME	Function	NO.	NAME	Function
1	PV	Indicates PV (measured value) and character information such as parameter codes and error codes (Red)	9	OUT2	Lamp lit when OUT2 is activated (Green)
2	SV	Indicates SV (target set value) and parameter Values (Green)	10	AT	Lamp lit when Auto-tuning is activated (Orange)
3	SET	Used for parameter calling up and set value registration	11	AL1	Lamp lit when Alarm 1 is activated (Red)
4	A/M	Auto/manual switch function	12	AL2	Lamp lit when Alarm 2 is activated (Red)
5	<	Shift digits when settings are changed	13	AL3	Lamp lit when Alarm 3 is activated (Red)
6	∨	Decrease Key (-1000,-100,-10,-1)	14	MAN	Lamp lit when controller in manual mode or get error condition (Orange)
7	∧	Increase Key (+1000,+100,+10,+1)	15	PRO	Lights when program running (Orange)
8	OUT1	Lamp lit when OUT1 is activated (Green)	16	OUT%	Output percentage (Green)

External and Panel Cutout Dimensions

| FY400	FY600	FY700	FY800	FY900
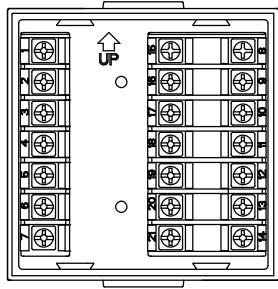
Terminal Arrangement

FY400
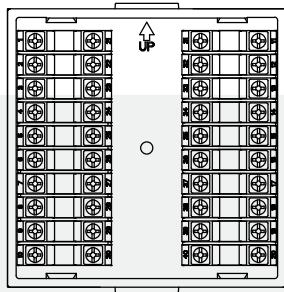
Category	Terminals
Power	① L ⑥ N AC 85~265V ① − ⑥ + DC 24V ⚠
Output-1	④⑤ Relay ④+⑤− SSR ④⑤ mA / V
Output-2	②③ Relay ②+③− SSR ②③ mA / V
Alarm	②③ AL1 or ⑪⑫ ⑬⑭ AL2
Commun-ication	⑪ T/R (B-) ⑫ T/R (A+) RS-485
1 Φ Zero cross	⑪ G1 ⑫ K1 ⑬ G2 ⑭ K2
Motor valve	② ③ CLOSE ④ OPEN ⑤ COM
Remote	⑪+ ⑫− mA / V
CT Input	⑪⑫ CT
TRS	⑪+ ⑫− mA / V
Input	⑦ ⑨+ ⑩− TC / mV ⑦ B ⑨ ⑩ RTD ⑦ ⑨ ⑩ mA / V

FY700

Category	Terminals
Power	① L ② N AC 85~265V ① − ② + DC 24V ⚠
Output-1	⑤ NO ⑥ NC ⑦ COM ⑥+⑦− SSR ⑥⑦ mA / V
Output-2	③④ Relay ③+④− SSR ③④ mA / V
Motor valve	③ ④ CLOSE ⑤ OPEN ⑥ ⑦ COM
Alarm	③④ AL1 ⑧ COM ⑨ NO ⑩ NC AL2 ⑳㉑ AL3
Commun-ication	⑮ T/R (B-) ⑯ T/R (A+) RS-485
TRS	⑱+⑲− mA / V
Remote	⑨+⑩− mA / V ⑮⑯ mA / V ⑱⑲+ mA / V
CT Input	⑮⑯ CT ⑱⑲ CT
1 Φ Zero cross	⑮ G1 ⑯ K1 ⑰ G2 ⑱ K2
1 Φ Phase angle	⑮ G1 ⑯ K1 ⑰ G2 ⑱ K2
Input	⑪ ⑬+ ⑭− TC / mV ⑪ B ⑬ ⑭ RTD ⑪ ⑬ ⑭ mA / V

FY600/800

Category	Terminals
Power	① L ② N AC 85~265V ① − ② + DC 24V ⚠
Output-1	⑧ NO ⑨ NC ⑩ COM ⑨+⑩− SSR ⑨⑩ mA / V
Output-2	⑥⑦ Relay ⑥+⑦− SSR ⑥⑦ mA / V
Motor valve	⑥ ⑦ CLOSE ⑧ OPEN ⑨ ⑩ COM
Alarm	③ NC ④ NO ⑤ COM AL1 ⑪ NC ⑫ NO ⑬ COM AL2 ⑥⑦ AL3
Commun-ication	⑭ T/R (B-) ⑮ T/R (A+) RS-485
TRS	⑫+⑬− mA / V ⑭⑮+ mA / V
Remote	⑭⑮+ mA / V
CT Input	⑭⑮ CT
Potentio-meter Input	⑭ CLOSE ⑮ WIPER ⑯ OPEN
Input	⑰ ⑲+ ⑳− TC / mV ⑰ B ⑲ ⑳ RTD ⑰ ⑲ ⑳ mA / V

FY900

Category	Terminals
Power	① L ② N AC 85~265V ① − ② + DC 24V ⚠
Output-1	⑧ NO ⑨ NC ⑩ COM ⑨+⑩− SSR ⑨⑩ mA / V
Output-2	⑥⑦ Relay ⑥+⑦− SSR ⑥⑦ mA / V
Motor valve	⑥ ⑦ CLOSE ⑧ OPEN ⑨ ⑩ COM
Alarm	③ NC ④ NO ⑤ COM AL1 ⑪ NC ⑫ NO ⑬ COM AL2 ⑥⑦ AL3
Commun-ication	⑭ T/R (B-) ⑮ T/R (A+) RS-485 or ㉛ T/R (B-) ㉜ T/R (A+) RS-485
TRS	㊴+㊵− mA / V
Remote/CT Input	⑭⑮+ mA / V ⑭⑮ CT
1 Φ Zero cross	㉛ G1 ㉜ K1 ㉝ G2 ㉞ K2
3 Φ Zero cross	㉛ RG1 ㉜ RK1 ㉝ RG2 ㉞ RK2 ㉟ TG1 ㊱ TK1 ㊲ TG2 ㊳ TK2
1 Φ Phase angle	㉛ G1 ㉜ K1 ㉝ G2 ㉞ K2
Potentio-meter Input	⑭ CLOSE ⑮ WIPER ⑯ OPEN
Input	⑰ ⑲+ ⑳− TC / mV ⑰ B ⑲ ⑳ RTD ⑰ ⑲ ⑳ mA / V

Specifications

| Model	FY400	FY700	FY600 / 800	FY900
Supply Voltage	AC 85 ~ 265V, DC 24V (Optional)			
Power Frequency	50/60 Hz			
Power Consumption	Approximately 6VA			
Memory	Non-Volatile Memory EEPROM			
Sensor Input ※ Please refer to Input Type Table	Accuracy : 0.1%			
	Sample time : 50ms			
	Thermocouple : (K, J, R, S, B, E, N, T, W, PLII, L)			
	RTD: PT100			
	DC Linear Analog Input: 0~20mA, 4~20mA 0~1V, 0~5V, 0~10V, 0~2V, 1~5V, 2~10V 0~25mV, 0~50mV, 0~70mV			
Output	OUT1 Relay	1a	1c	1c	1c
		1a SPST-NO, 250 VAC, 5A (resistive load), electrical life: 100,000 operations 1c SPDT-NO, 250 VAC, 5A (resistive load), electrical life: 50,000 operations SPDT-NC, 250 VAC, 2A (resistive load), electrical life: 20,000 operations			
	OUT2 Relay	SPST-NO, 250 VAC, 5A (resistive load), electrical life: 100,000 operations			
	SSR Drive	ON: 24 V OFF: 0V max. load current: 20mA, with short protection			
	Linear	4~20mA, 0~20mA, 0~5V, 0~10V, 1~5V, 2~10V			
Control Method	ON-OFF or P, PI, PID control			
Alarm	Alarm 1	1a	1a	1c	1c
	Alarm 2	1a	1c	1c	1c
		1a SPST-NO, 250 VAC, 5A (resistive load), electrical life: 100,000 operations 1c SPDT-NO, 250 VAC, 5A (resistive load), electrical life: 50,000 operations SPDT-NC, 250 VAC, 2A (resistive load), electrical life: 20,000 operations			
	Alarm 3	---	1a	1a	1a
		SPST-NO, 250 VAC, 5A (resistive load), electrical life: 100,000 operations			
TRS	Re-transmitted Signal	4~20mA, 0~20mA, 0~5V, 0~10V, 1~5V, 2~10V			
	Source of Re-transmission	PV, SV			
	Accuracy	0.1%			
	Resolution	14 bit			
Remote SV	Signal	4~20mA, 0~20mA, 0~5V, 0~10V, 1~5V, 2~10V			
	Resolution	18 bit			
	Controlled by	SV			
Potentiometer Input	Signal	500~1KΩ			
	Accuracy	±5% FS ±1 digit max.			
Communication	Interface	RS-485 Half duplex Communication MAX. 31 units, MAX. distance 1200 meters			
	Protocol	Modbus RTU, TAIE			
	Parity bit	NONE, ODD, EVEN			
	Data bit	8 bit			
	Stop bit	1 or 2 bit			
	Baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200 bps			
Malfunction vibration	10~55 Hz 20m / s² , for 10 mins. each in X, Y and Z directions.			
Vibration resistance	10~55 Hz 20m / s² , for 2 hr. each in X, Y and Z directions.			
Malfunction shock	100m / s² , 3 times each in X, Y and Z directions.			
Shock resistance	300m / s² , 3 times each in X, Y and Z directions.			
Operating environment Temperature / Humidity	0 ~ 50°C (in the case of no freezing or condensation) / 20% ~ 90% RH			
Storage environment Temperature	-25 ~ 65°C (in the case of no freezing or condensation)			
Terminal cover	●	●	●	●
Dimension (mm)	W48 x H48 x D91	W72 x H72 x D73	W48 x H96 x D73	W96 x H96 x D73
Weight	Appox.120g	Appox.150g	Appox.170g	Appox.230g

Order Information

Block means optional functions with additional charge

Model	Output 1	Output 2	Alarm	TRS	Remote	COMM	Input type	Power	Accessories
FY900(Red/Green light) FY901(Blue/White light) FY902(Large LED) PFY900(Program)	1	0	1	0	0	0	01	A	N

Model
- FY900(Red/Green light)
- FY901(Blue/White light)
- FY902(Large LED)
- PFY900(Program)

FY400	48x48mm
FY600	96x48mm
FY700	72x72mm
FY800	48x96mm
FY900	96x96mm

PFY400 / 401	48x48mm
PFY600 / 602	96x48mm
PFY700 / 701	72x72mm
PFY800 / 801	48x96mm
PFY900 / 901 / 902	96x96mm

Output 1
- 0 None
- 1 Relay
- 2 Voltage Pulse (SSR Drive)
- 3 4-20mA
- 4 0-20mA
- A 0-5V
- B 0-10V
- C 1-5V
- D 2-10V
- 5 1φSCR zero cross control
- 6 3φSCR zero cross control
- 7 Motor valve control
- 8 1φSCR phase angle control
- 9 3φSCR phase angle control

Output 2
- 0 None
- 1 Relay
- 2 Voltage Pulse (SSR Drive)
- 3 4-20mA
- 4 0-20mA
- A 0-5V
- B 0-10V
- C 1-5V
- D 2-10V

Alarm
- 0 None
- 1 1Set
- 2 2Sets
- 3 3Sets
- A HBA
- B HBA+AL2
- C HBA+AL2+AL3

TRS
- 0 None
- 1 4-20mA
- 2 0-20mA
- A 0-5V
- B 0-10V
- C 1-5V
- D 2-10V

Remote
- 0 None
- 1 4-20mA
- 2 0-20mA
- A 0-5V
- B 0-10V
- C 1-5V
- D 2-10V
- M Motor valve control feedback

COMM
- 0 None
- 3 TTL
- B RS-485

Input type
- See input type table code

Power
- A AC 85-265V
- D DC 24V

Accessories
- N None
- T Terminal Cover
- W IP65
- R Terminal Cover +IP65

Input Type Table

TYPE	Thermocouple														RTD		
	K		J		R	S	B	E	N	T		W	PLII	L	PT100		
Kind	K1	K2	J1	J2	R	S	B	E	N	T1	T2	W	PLII	L	PT1	PT2	PT3
Code	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17

Range °C

Kind	Max	Min
K1	600.0	-50.0
K2	1200	-50
J1	400.0	-50.0
J2	1200	-50
R	1760	-50
S	1760	-50
B	1820	-50
E	900	-50
N	1300	-50
T1	400.0	-199.9
T2	400	-199
W	2320	-50
PLII	1200	-50
L	800	-50
PT1	850.0	-199.9
PT2	850	-199
PT3	850	0

TYPE	LINEAR											
	AN1	AN2						AN3	AN4			
Code	18	19	20	21	22	23	24	25	26	27	28	29
Range	0~25mV	0~50mV	0~20mA	0~1V	0~2V	0~5V	0~10V	0~70mV	4~20mA	10~50mV	1~5V	2~10V
	4 kinds of choices：-1999~9999 -199.9~999.9 -19.99~99.99 -1.999~9.999											

⚠

- Before operating this product, read the instruction manual carefully to avoid incorrect operation.
- This product is intended for use with industrial machines, test and measuring equipment.
- It is not design for use with medical equipment.
- If it is possible that an accident may occur as a result of the failure of the product or some other abnormality, an appropriate independent protection device must be installed.