

NFY

Series
Controller

NFY400 NFY700
NFY600 NFY800
NFY900

New-Generation NFY Series Digital PID Temperature Controller

new-generation



TAIE

TAIWAN INSTRUMENT & CONTROL CO., LTD

Classical Re-evolution

High Quality & High Performance
With Best Process Control

Double Loop

Precise Control

High Reliability

High Accuracy $\pm 0.1\%$

Sampling Time 50ms



Speed upper to
115200 bps

Excellent Anti-Interference Ability

Adopt new anti-interference algorithm and pass the highest level of EMC verification in CE certification. It can resist electromagnetic interference in heavy noise environment.



Double-Loop Design

The input adopts double-loop design, which can accept two sensor input and drive two output module at the same time, realize temperature and humidity control on a NFY900.



High Speed Sampling and High Accuracy

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



Certification and Universal Voltage

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



Customize Function Key

It can be quickly executed the event by A/M key.
Ex: auto/manual switch, run/stop switch etc.



Parameter Lock Function

All parameters are separated in five operation levels (Level1~Level5). Each parameter can be hidden or locked to prevent users unauthorized changes.



Status Indicator Light

Real time monitor the status of output(OUT1/OUT2) , alarm(AL1/AL2/AL3), auto-tuning(AT), manual output(MAN) and program execute(PRO).

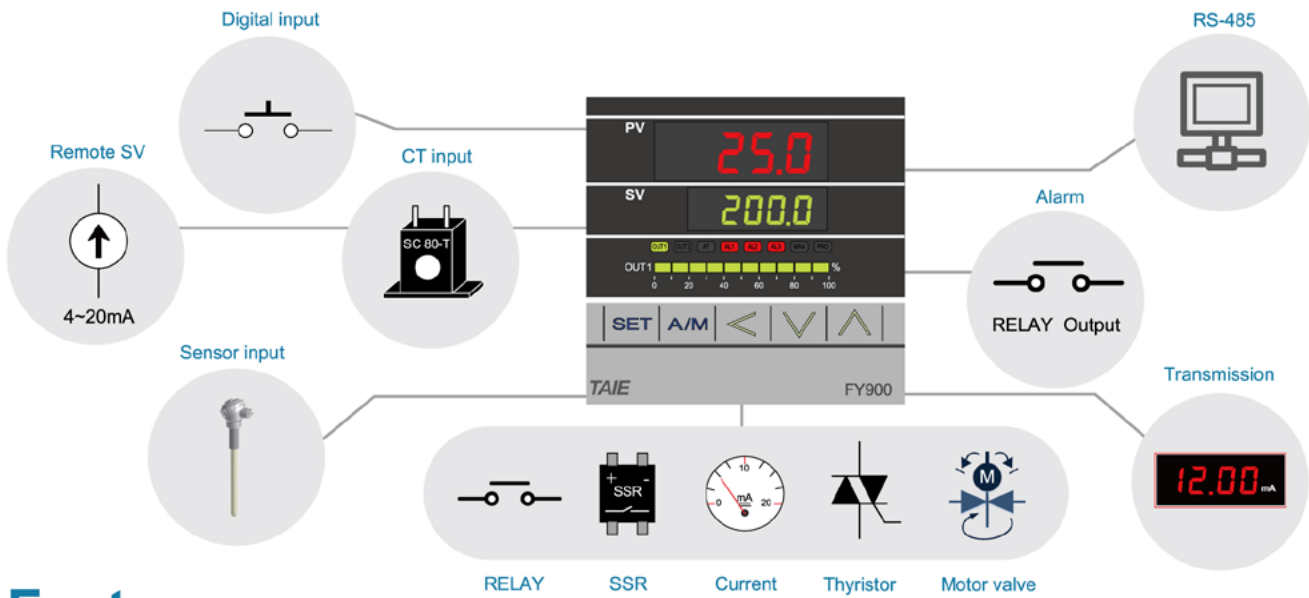


Bar-Graph

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 NFY400).

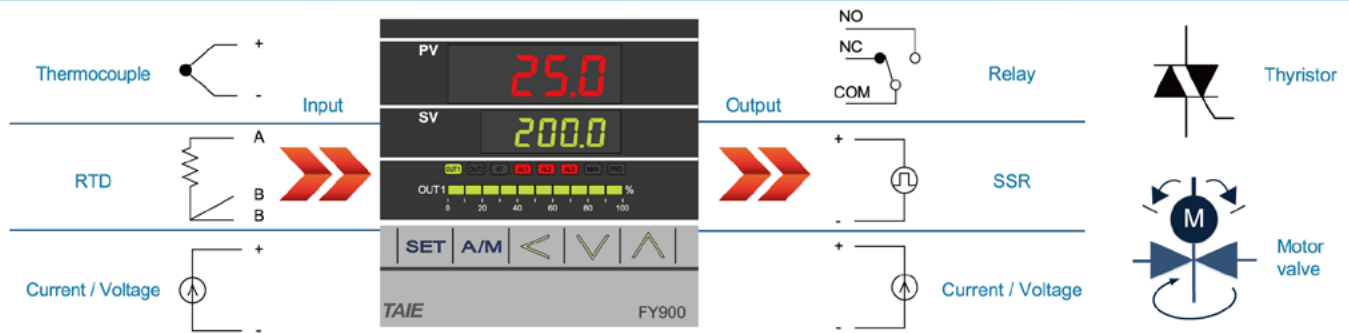


Function block diagram



Features

Various I/O Types



Excellent Control Performance

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

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

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

Powerful Program Control

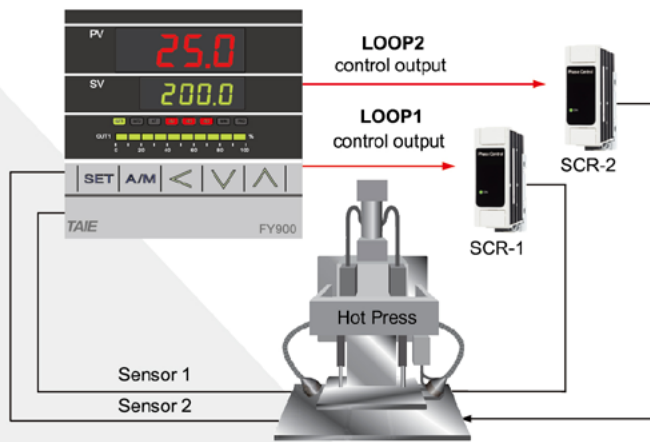
Provides 15 patterns of 10 segments of program control, each segment can be arbitrarily set to ramp, soak, step or cool down temperature, the user can be arbitrary according to the demand, the maximum can support to 150 segments program control.



Features

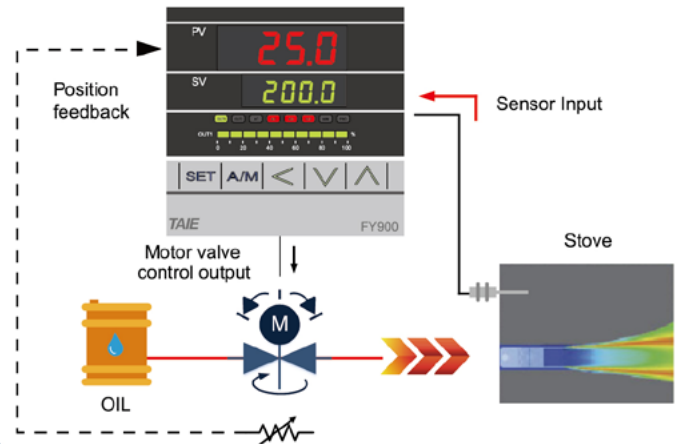
Double Loop Control

Double Loop design, accept two sensor inputs at the same time, independently control two systems, effectively reduce system costs.



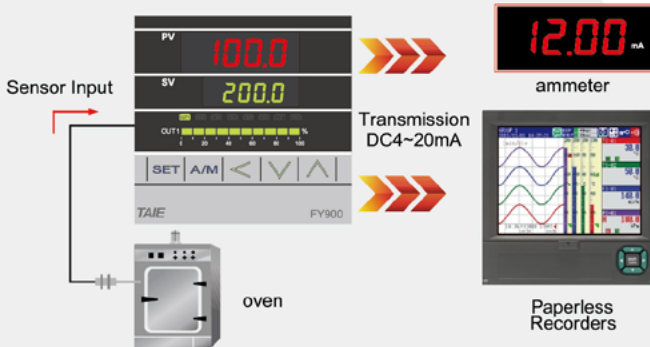
Motor Valve Control

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



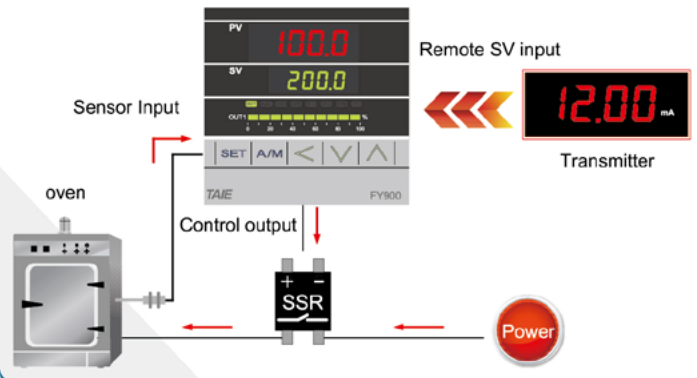
Transmission

Transfer parameter digital values as analog signals to external devices.
 signals : 0~20mA , 4~20mA , 0~5V , 1~5V , 0~10V ...
 parameters : SV1, PV1, MV1...



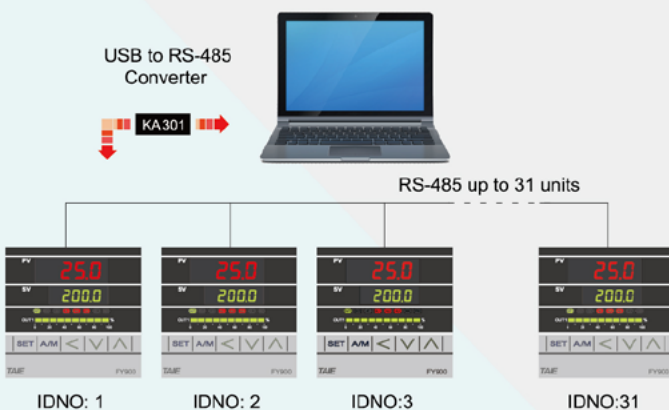
Remote SV

SV value is controlled by an analog signal from an external device.
 signals : 0~20mA , 4~20mA , 0~5V , 1~5V , 0~10V ...
 parameters : SV



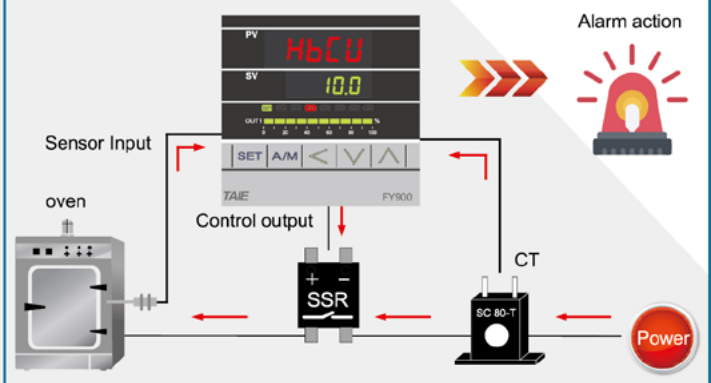
Communication

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



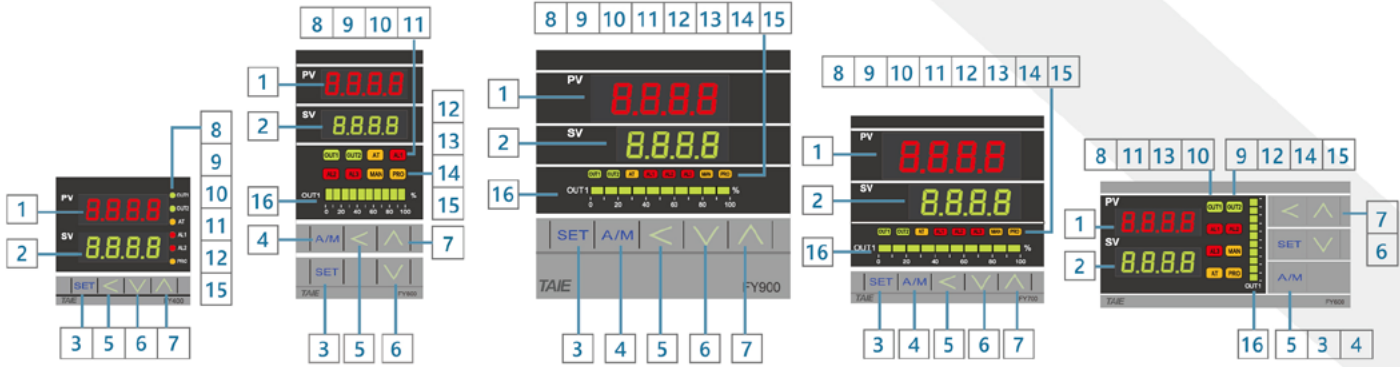
Heater Break Alarm(HBA)

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.



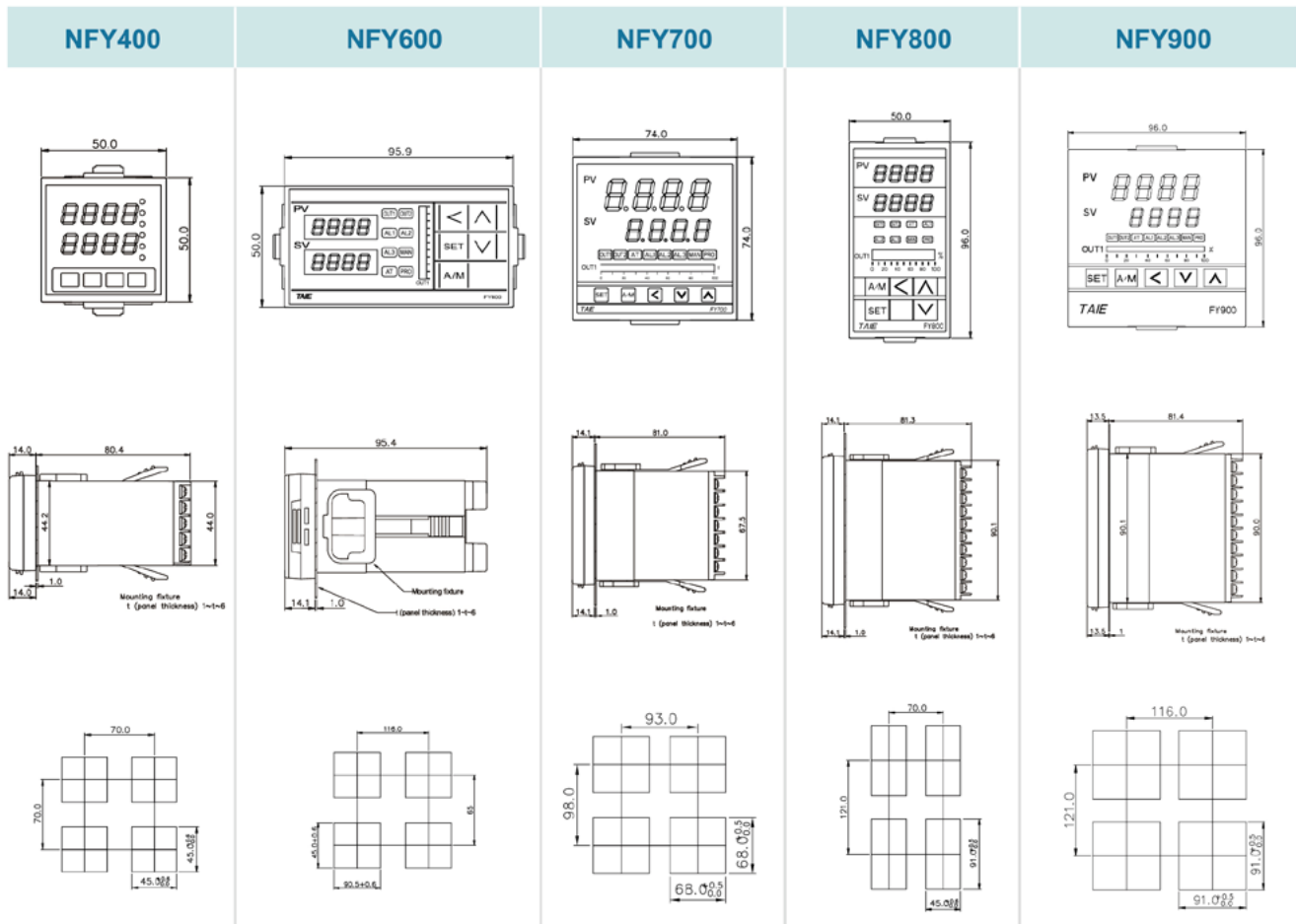
Appearance

Parts Description



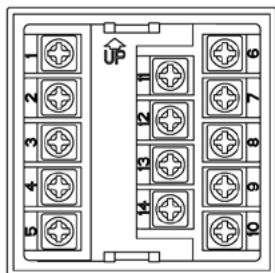
NO.	NAME	Function	NO.	NAME	Function
1	PV	Indicates PV (measured value) and character information such as parameter codes and error codes (Red)	9	OUT2	Lamp lit when OUT2 is activated (Green)
2	SV	Indicates SV (target set value) and parameter Values (Green)	10	AT	Lamp lit when Auto-tuning is activated (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 or others function start	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		Lamp lit when OUT1 is activated (Green)	16	OUT%	Output percentage (Green)

External and Panel Cutout Dimensions



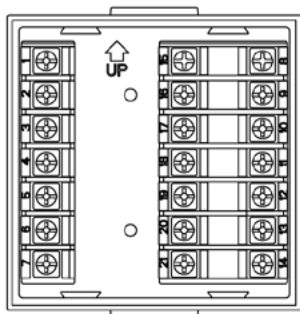
Terminal Arrangement

NFY400



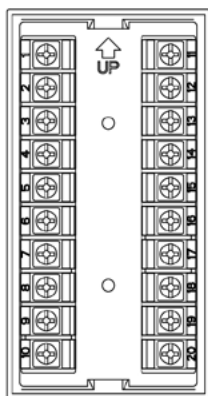
Power		Communication		Motor valve	
Output-1		1 Φ Zero cross		Remote/CT Input	
Output-2				TRS	
Alarm-1 Alarm-2		DI Input		Input	

NFY700



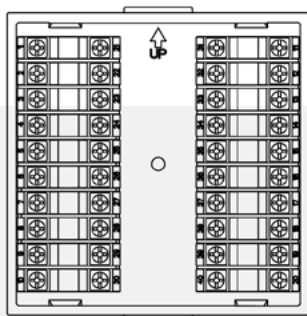
Power		Alarm-1 Alarm-2 Alarm-3		1 Φ Zero-cross Phaseangle	
Output-1		Communication			DI Input
Output-2		TRS		Input	
Motor valve		Remote CT Input			

NFY600/800



Power		Alarm-1 Alarm-2 Alarm-3		DI Input	
Output-1		Communication		Input-1	
Output-2					
Motor valve		TRS		Input-2	
		Remote/CT Input			

NFY900



Power		Alarm-1 Alarm-2 Alarm-3		1 Φ / 3 Φ Zero cross	
Output-1		Communication			
Output-2		TRS		1 Φ Phase angle	
DI Input		Remote/CT Input			
Motor valve		Input-1		Input-2	

Specifications

Standard Spec.	
Supply voltage	AC 85 ~ 265V DC 24V ±10%
Power Consumption	AC approx. 6VA DC approx. 4W
Memory	Non-volatile memory Maximum writes : 1000,000 times Data retention : 10 years
Operating temperature	0~50°C (32~122°F)
Humidity range	20% ~ 90% RH
Weight	NFY400 approx. 120g NFY600 approx. 170g NFY700 approx. 150g NFY800 approx. 170g NFY900 approx. 230g
Dimension (mm)	NFY400 48W X 48H X 95.5L (1/16 DIN) NFY600 96W X 48H X 95.5L (1/8 DIN) NFY700 72W X 72H X 95.5L (3/16 DIN) NFY800 48W X 96H X 95.5L (1/8 DIN) NFY900 96W X 96H X 95.5L (1/4 DIN)
Operating environment	Non-corrosive, flammable gas, slight dust ring environment, no high frequency, no direct shock, places the sun is not directly exposed.
Input	
Set	Maximum 2 sets
Accuracy	Cold junction compensation diode external ±(0.1% of reading + 1 digit) Cold junction compensation diode inside ±(0.3% of reading + 1 digit)
Sampling time	50ms
TC	K、J、R、S、B、E、N、T、W、PLI、L
RTD	PT100
mA dc	0~5V、0~10V、0~2V、1~5V 2~10V、0~25mV、0~50mV、 0~20mA、4~20mA、0~1V、 10~50mV、0~70mV
Input filter	First-order low-pass filter Time constant : 0.1 to 10.0 sec.(When set to 0, the filter is off)
PV compensation	Both zero and high points can be compensated
Output	
Set	Maximum 2 sets
Control	1.PID, P, PI, and PD control (including AT function) 2.ON/OFF control 3.Heat and Cooling PID control (including AT function)
Relay	1.SPST-NO, 250VAC, 5A Electrical life : 100,000 times 2.SPDT-NO, 250VAC, 5A Electrical life : 50,000 times 3.SPDT-NC, 250VAC, 2A Electrical life : 20,000 times
SSR	ON : 24 V OFF: 0V Maximum load current : 20mA With short circuit protection circuit
mA	Resolution: 10 bits Signal type: 4~20mA, 0~20mA, 0~5V, 0~10V, 1~5V, 2~10V
Heater Break Alarm (HBA)	
CT model	SC-80T, SC-100T
Maximum current	SC-80T : 80A, SC-100T : 100A
Accuracy	SC-80T : ±3%, SC-100T : ±5%
Aperture	SC-80T : 5.9mm, SC-100T : 12.6mm
Output	Free load alarm 1~3

Alarm	
Set	Maximum 3 sets
Mode	Program end, System error, HBA, Soak timer, Deviation high, Deviation low, Band, Process high, Process low, Program run, System normal, Ramp Soak Timer, Timer, Counter, 24H Timer
Relay specifications (resistive load)	1.SPST-NO, 250VAC, 5A Electrical life: 100,000 times 2.SPDT-NO, 250VAC, 5A Electrical life: 50,000 timers 3.SPDT-NC, 250VAC, 2A Electrical life: 20,000 times
Timer	
set	1 set
Time Format	Hour : Minute. or Minute : second
Maximum Time	99hr.59min ~ 99min.59sec
output	Free load alarm 1~3
Transmission	
set	1 set
Resolution	14 bits
Accuracy	0.1%
Parameters	SV1, PV1, MV1, SV1R, PV1R, MV1R, SV2, PV2, MV2, SV2R, PV2R, MV2R
Signal Type	4~20mA, 0~20mA, 0~5V,0~10V, 1~5V, 2~10V
Remote	
set	1 set
Resolution	18 bits
Parameters	Local SV
Signal Type	4~20mA, 0~20mA, 0~5V,0~10V, 1~5V, 2~10V
Motor Valve	
set	1 set
Resolution	18 bits
Parameters	PV2
Signal Type	1KΩ or 560Ω
Digital Input	
set	2 sets
External contact specifications	Dry contact without electricity Open circuit : over 500KΩ Short circuit : less 10Ω
Function	1.SV switching 2.RUN/STOP switching 3.Manual switching 4.AT RUN/STOP 5.Remote SV RUN/STOP 6.Retransmission RUN/STOP 7.Timer RUN/STOP 8.Counter 9.Program RUN/STOP
Communication	
Communication	RS-485
Protocol	Modbus RTU, TAIE
Baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Communication format configuration	1. Starting bit : 1 2. Information bits : 8 3. Bit check : None, Odd, Even 4. Stop bits : 1 or 2
Reponses time	0~250ms
Maximum connections	31pcs

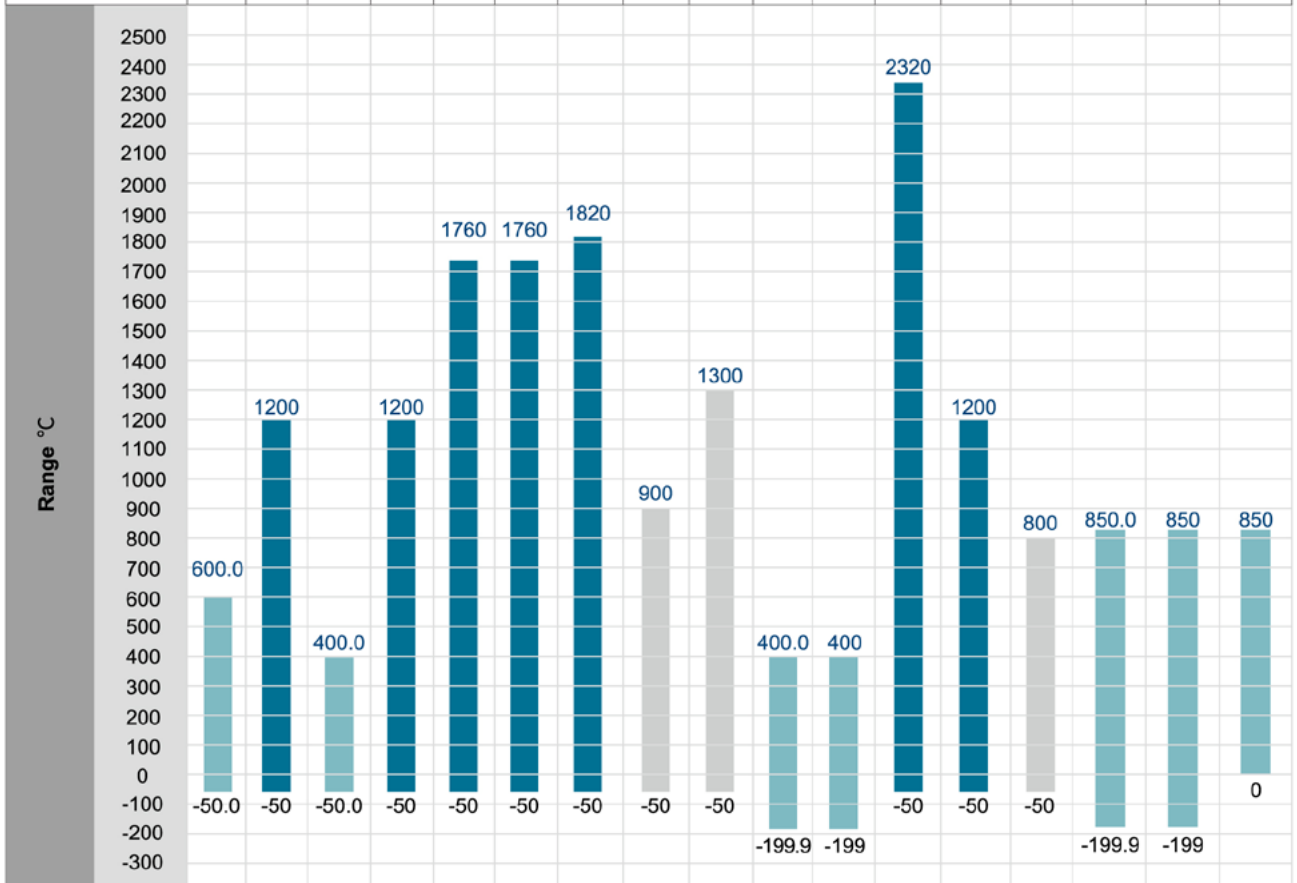
Order Information

Block means optional functions with additional charge

Model	Output 1	Output 2	Alarm	TRS	Remote	COMM	Input type	Power	Accessories
NFY900(Red/Green light) NFY901(Blue/White light) NFY902(Large LED) PNFY900(Program)	1 0 0 1 2 3 4 A B C D	0 1 2 3 4 A B C D	1 0 1 2 3 A B C	0 1 2 A B C D	0 1 2 A B C D	0 3 B C	01 A D	A D	N T W R
	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	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	0 None 1 1Set 2 2Sets 3 3Sets A HBA B HBA+AL2 C HBA+AL2+AL3	0 None 1 4-20mA 2 0-20mA A 0-5V B 0-10V C 1-5V D 2-10V	0 None 1 4-20mA 2 0-20mA A 0-5V B 0-10V C 1-5V D 2-10V E DI F Remote+DI M Motor valve control feedback J PT(Second Input) K TC(Second Input) L Linear(Second Input)	0 None 3 TTL B RS-485(FY) C RS-485(NFY)	See input type table code	A AC 85-265V D DC 24V	N None T Terminal Cover IP65 W Terminal Cover +IP65 R Terminal Cover +IP65
NFY400 48x48mm NFY600 96x48mm NFY700 72x72mm NFY800 48x96mm NFY900 96x96mm	PNFY400 / 401 48x48mm PNFY600 / 602 96x48mm PNFY700 / 701 72x72mm PNFY800 / 801 48x96mm PNFY900 / 901 / 902 96x96mm								
	5 1φSCR zero cross control 6 3φSCR zero cross control 7 Motor valve control 8 1φSCR phase angle control								
									※ HBA :Heater Break Alarm (HBA must use AL 1 as alarm relay) ※ The Second Input FY600/800/900only

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	DP1	DP2	DP3
Code	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17



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.



TAIWAN INSTRUMENT & CONTROL CO., LTD
 COPYRIGHT © 2018 All Rights Reserved
 Printed in Taiwan

