

# Shihlin Electric & Engineer Corporation

## Micro Computer Temperature Controller **WT SERIES**



High Quality, Innovation and High Tech

REGISTERED  
4EBY004-04



Sensors



Servos



Laser Maker



Inverters



Programmable Controller



HMI



Temp. Controller

**Shihlin Electric**

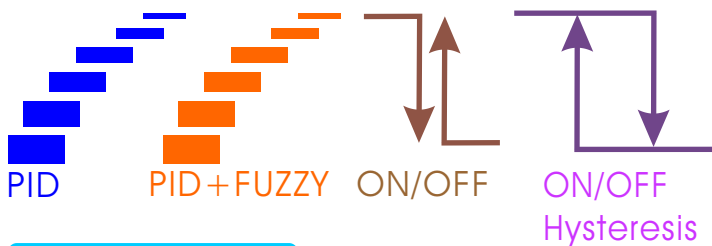
[www.seec.com.tw](http://www.seec.com.tw)

# WT SERIES

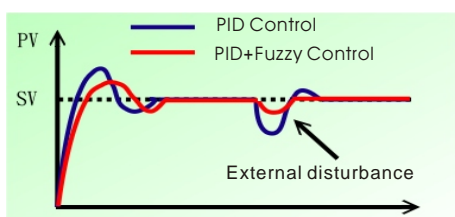
## Win Temperature

### Excellent Control

#### Control Method

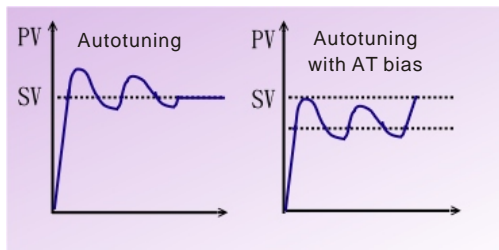


#### Fuzzy Logic



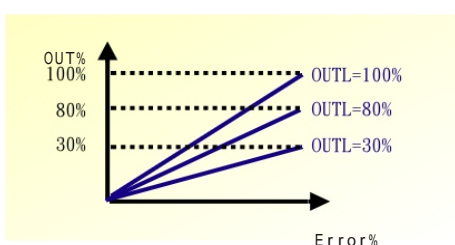
Built in fuzzy logic suppress the overshoot due to SV changes or external disturbance.

#### Autotuning(AT)



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

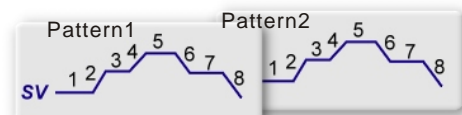
#### Limit Setting



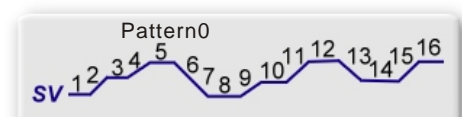
Built in output limit function. Use this function to get different output and set limit for output.

### Special Application

#### Ramp/Soak Program

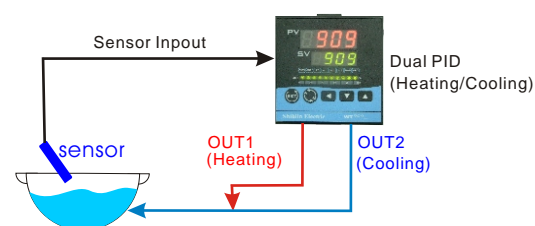


There are 2 patterns by 8 segments can be used in ramp/soak program.

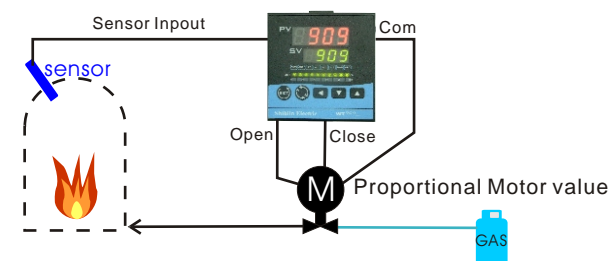


There are 2 patterns can be linked together as 16 segments in ramp/soak program.

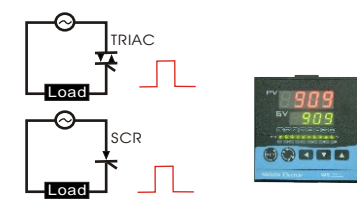
#### Heating and cooling Control



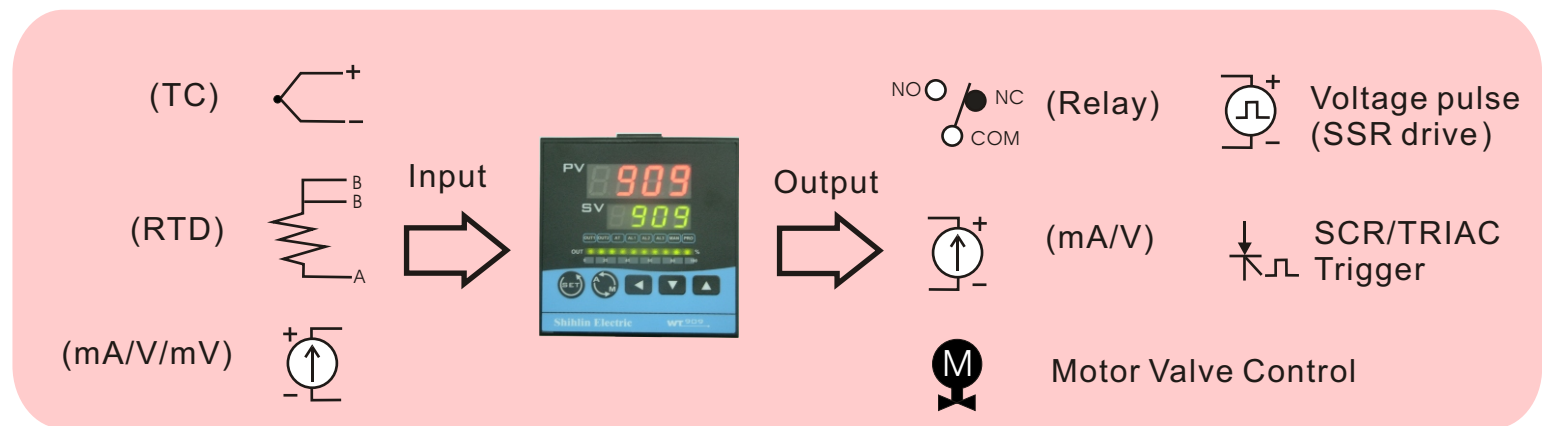
#### Motor Valve Control



#### SCR/TRIAC Trigger

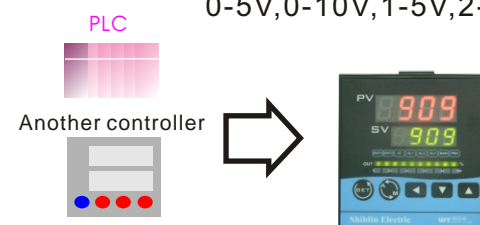


Method: 1φ/3φ Zero Cross Control  
1φ/3φ Phase Angle Control



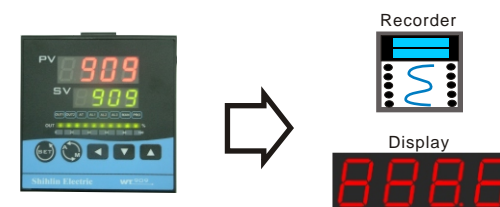
#### Remote SV

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



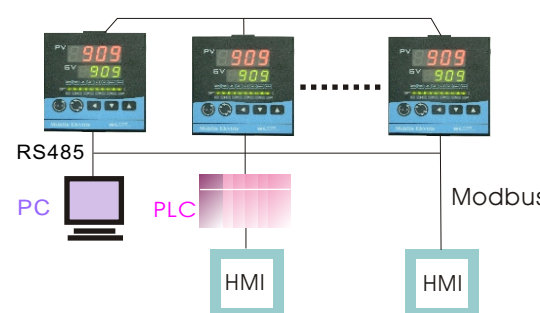
#### Transmission

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



#### Communication

Up to 31 controllers can be connected. Max length 1200M.

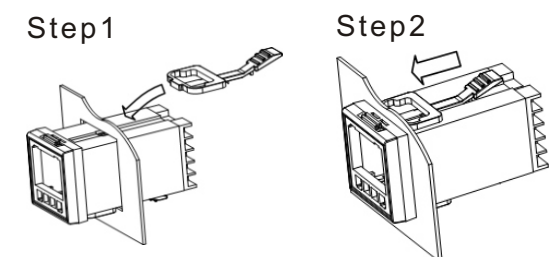


#### (TTL Communication)

Up to 10 controllers can be connected. Max length 1M.

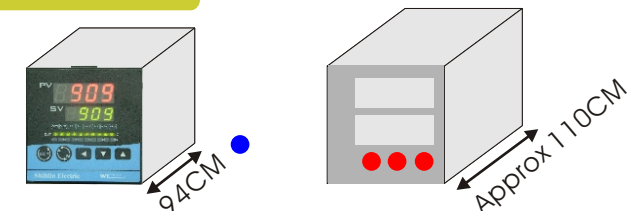
The SV value of slave controllers will be remote master controller, and reached to max value at the same time.

#### Easy Mounting



Just push the mounting bracket to panel. Without using any screws.

#### Saving Space



WT Series are shorter than other brands. But with more functions.

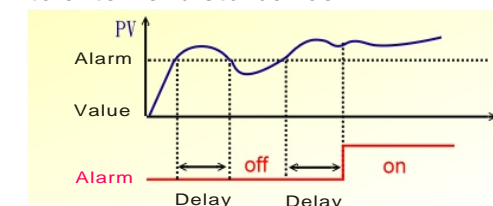
#### Alarm Function

Maximum with 3 sets of alarm. Alarm types list as below:

Deviation	System
Deviation High Alarm	System Failed Alarm
Deviation Low Alarm	System Normal Alarm
Deviation High/Low Alarm	
Band Alarm	
PV	Program
PV High Alarm	Program Run Alarm
PV Low Alarm	Program End Alarm
	Segment End Alarm

#### Delay Time

Use this function avoid alarm acts frequently or acts due to external disturbance.



# Parts Description

## OUT1 % Bar-Graph display

**Best** Output present displayed on the bar-graph in 10 LEDs resolution (except Wt404).

**SET** Set key

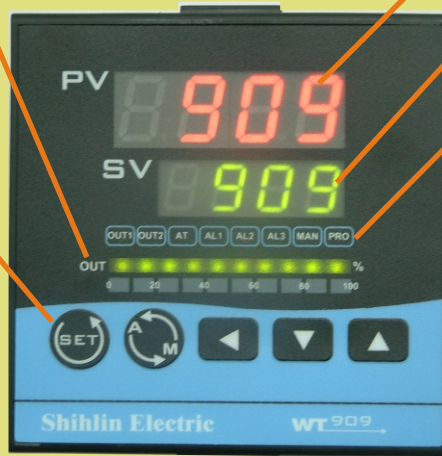
**A/M** Auto/Manual key

**Best** Switches between Auto(PID) output mode and Manual output (except WT404).

**▲** Up key (\*program Run)

**▼** Down key (\*program Hold)

**◀** Shift key



Measured value (PV)display

Setting value (SV)display

**OUT1** OUT1 lamp

**OUT2** OUT2 lamp

**AT** Autotuning lamp

**AL1** Alarm 1 lamp

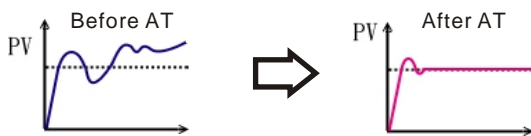
**AL2** Alarm 2 lamp

**AL3** Alarm 3 lamp

**MAN** Manual output lamp

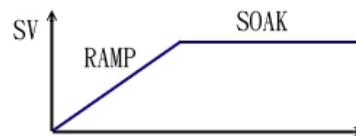
**PRO** Program Running lamp

## Autotuning(AT)



AT Function can calculate the optimize PID value for your control system, without trying and error manually.

## RAMP & SOAK



Built in 1 segment of RAMP & SOAK Function. Applicable on SOFT start condition.

## IP65 Proof

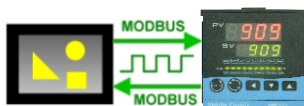


Ip66 dust & water proof is available for all models (optional function).

## High Accuracy

Input with 14bit A/D resolution,0.2% accuracy of FS.Built in AutoZero-AutoSpan function keep good accuracy.

## MODBUS Communication



WT series sport both MODBUS RTU and MODBUS ASCII protocol. Communication between controller and HMI or otherequipment is more convenient (optional function).

## CE UL approval & free power

All models get CE and UL approval. Operate on any voltage from AC 85~265V at 50/60 Hz. DC24V is also available(optional function).

## Data Lock Function

All parameters are separated in 3 operation levels. Each parameter can be hidden or locked to prevent unauthorized changes.

## Heater Break Alarm



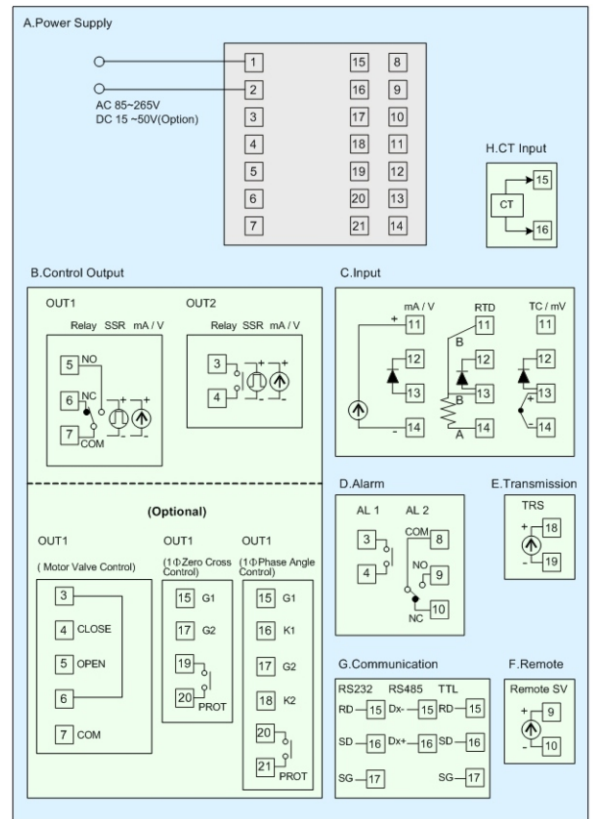
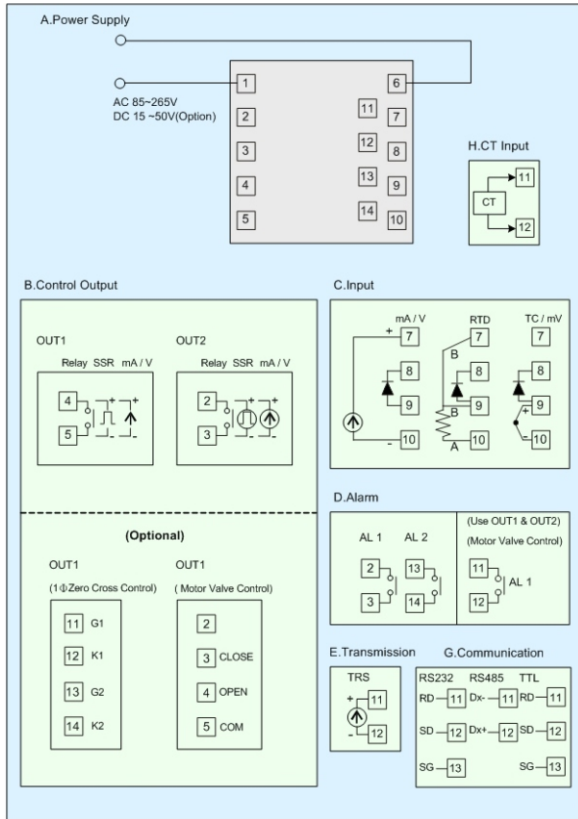
Heater current flowing through CT can be displayed on controller.

If heater current is less then HBA set value, AL1 will be activated(optional function).

# Terminal Arrangement

WT404

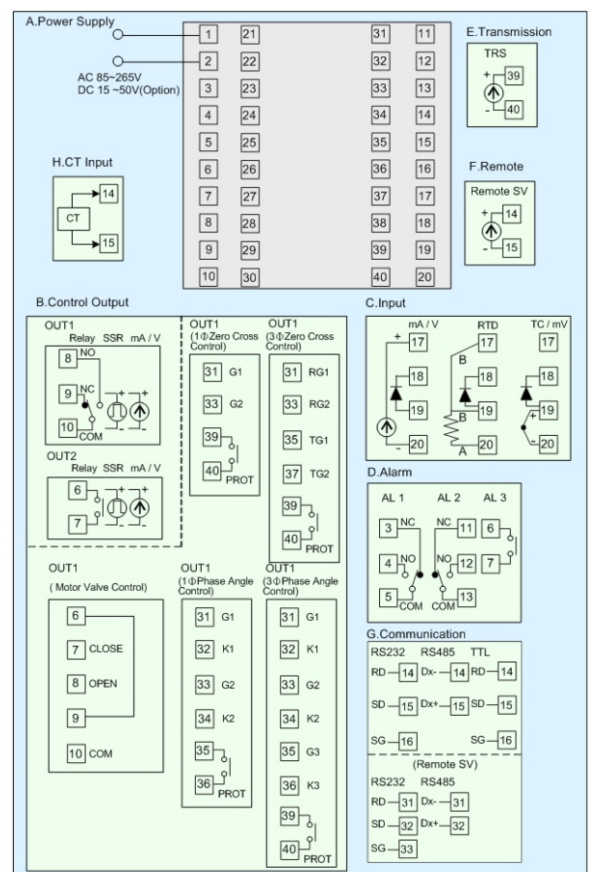
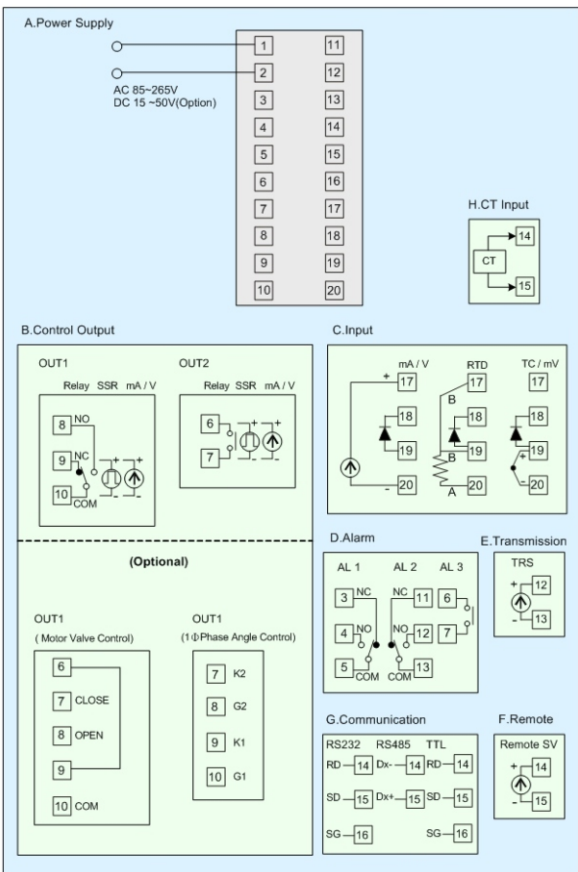
WT707



WT409

904

WT909



# Order Information

## Example

Model	OUT1	OUT2	Alarm	TRS	Remote SV	Communication	Input Type	Power	Normal
WT-404	1	0	1	0	0	0	02	A	S

## Order Information

Model	OUT1	OUT2	Alarm	TRS	Remote SV	Communication	Input Type	Power	Normal & Program
WT-404	0 None	0 None	0 None	0 None	0 None	0 None	02 See Input Codes	A AC100-240V	S Normal
WT-707	1 Relay	1 Relay	1 一組	1 4-20mA	1 4-20mA	3 TTL		D DC 24V	P Program
WT-409	2 Voltage Pulse (SSR Drive)	2 Voltage Pulse (SSR Drive)	2 二組	2 0-20mA	2 0-20mA	A MODBUS RS232	02 See Input Codes	A AC100-240V D DC 24V	S Normal P Program
WT-904	3 4-20mA	3 4-20mA	3 三組	A 0-5V	A 0-5V	B MODBUS RS485			
WT-909	4 0-20mA	4 0-20mA	A HBA*	B 0-10V	B 0-10V	02 See Input Codes			
	A 0-5V	A 0-5V	B HBA+AL2	C 1-5V	C 1-5V				
	B 0-10V	B 0-10V	C HBA+AL2+AI3	D 2-10V	D 2-10V				
	C 1-5V	C 1-5V							
	D 2-10V	D 2-10V							
	5 1φSSR								
	6 3φSSR								
	7 Motor valve Control								
	8 1φSCR								
	9 3φSCR								

Block means optional functions with additional charge

\* HBA:Heater Break Alarm(HBA must use AI1 as alarm relay)

## Combination of options and models

○ Available    × Not available

Model	RAMP/SOAK Program	OUT1					Output2	Alarm2	Alarm3	HBA	Transmission	Remote SV	Communication	Power DC24V
		1φ SSR	3φ SSR	Motor valve control	1 φSCR	3 φSCR								
WT-404	○	○	×	○	×	×	○	○	×	○	○	○	○	○
WT-904	○	×	×	○	○	×	○	○	○	○	○	○	○	○
WT-707	○	○	×	○	○	×	○	○	○	○	○	○	○	○
WT-409	○	×	×	○	○	×	○	○	○	○	○	○	○	○
WT-909	○	○	○	○	○	○	○	○	○	○	○	○	○	○

\* Remote SV function is not available ,if HBA function has been spcified

## Input type table

	TYPE	CODE	RANGE			TYPE	CODE	RANGE			TYPE	CODE	RANGE																													
			TYPE	CODE	RANGE			TYPE	CODE	RANGE			TYPE	CODE	RANGE																											
TC	K	K1	01	0.0-200.0 C(392.0 F)	K2	02	0.0-400.0 C(752.0 F)	K3	03	0-600 C(1112 F)	J	J1	07	0.0-200.0 C(392.0 F)	J2	08	0.0-400.0 C(752.0 F)	J3	09	0-600 C(1112 F)																						
		K4	04	0-800 C(1472 F)		K5	05		0-1000 C(1832 F)	K6		06	0-1200 C(2192 F)	J4		10	0-800 C(1472 F)		J5	11	0-1000 C(1832 F)	J6	12	0-1200 C(2192 F)																		
	R	R1	13	0-1600 C(2912 F)	R2	14	0-1769 C(3216 F)	S	S1	15	0-1600 C(2912 F)	E	E1	18	0-800 C(1472 F)	E2	19	0-900 C(1652 F)	N	N1	20	0-1200 C(2192 F)	N2	21	0-1300 C(2372 F)																	
		B	B1	17		0-1820 C(3308 F)	S2		16	0-1769 C(3216 F)	N		N1	20	0-1200 C(2192 F)		N2	21		0-1300 C(2372 F)																						
	PLII	T	T1	22	0.0-400.0 C(752.0 F)	T2	23	0.0-200.0 C(392.0 F)	T3	24	0.0-350.0 C(662.0 F)	LINEAR	AN1	61	-10-10mA	AN2	71	0-10mV	AN3	76	0-20mV	AN4	81	0-50mV	AN5	82	0-20mV	AN6	83	0-1V	AN7	84	0-5V	AN8	85	0-10V	AN9	86	0-5KR	AN10	87	0-2V
		W	W1	25	0-2000 C(3632 F)	W2	26	0-2320 C(4208 F)	U	U1	29		-199.9-600.0 C(999.9 F)	U2	30		-199.9-200.0 C(392 F)	U3		31	0-400 C(752 F)		91	10-50mV		92	4-20mA		93	1-5V		94	2-10mV									
		L	L1	32	0-400 C(752.0 F)	L2	33	0-800 C(1472 F)	RTD	JP1	41		-199.9-600.0 C(999.9 F)	JP2	42		-199.9-400.0 C(752 F)	JP3		43	-199.9-200.0 C(392 F)		95	0-50mV		96	0-20mV		97	0-1V		98	0-5V		99	0-10V		100	0-5KR			
		JPT	JP1	41	-199.9-600.0 C(999.9 F)	JP2	42	-199.9-400.0 C(752 F)		JP3	43		-199.9-200.0 C(392 F)	101	0-50mV		102	0-20mV		103	0-1V		104	0-5V		105	0-10V		106	0-5KR												
		100	JP4	44	0-200 C(392 F)	JP5	45	0-400 C(752 F)		JP6	46		0-600 C(1112 F)	107	0-50mV		108	0-20mV		109	0-1V		110	0-5V		111	0-10V		112	0-5KR												
		PT	DP1	47	-199.9-600.0 C(999.9 F)	DP2	48	-199.9-400.0 C(752 F)		DP3	49		-199.9-200.0 C(392 F)	113	0-50mV		114	0-20mV		115	0-1V		116	0-5V		117	0-10V		118	0-5KR												
	100	DP4	50	0-200 C(392 F)	DP5	51	0-400 C(752 F)	DP6		52	0-600 C(1112 F)	119	0-50mV	120	0-20mV	121	0-1V	122	0-5V	123	0-10V	124	0-5KR																			
	JPT	JP.1	53	-199.9-600.0 C(999.9 F)	JP.2	54	-199.9-400.0 C(752.0 F)	JP.3		55	-199.9-200.0 C(392.0 F)	125	0-50mV	126	0-20mV	127	0-1V	128	0-5V	129	0-10V	130	0-5KR																			
50	JP.4	56	0-200 C(392 F)	JP.5	57	0-400 C(752 F)	JP.6	58	0-600 C(1112 F)	131	0-50mV	132	0-20mV	133	0-1V	134	0-5V	135	0-10V	136	0-5KR																					

	TYPE	CODE	RANGE	
LINEAR	AN1	61	-10-10mA	
		62	-2-2V	
		63	-5-5V	
		64	-10-10V	
		AN2	71	0-10mV
			76	0-20mV
	AN3	81	0-50mV	
		82	0-20mV	
		83	0-1V	
		84	0-5V	
		85	0-10V	
		86	0-5KR	
AN4	87	0-2V		
	91	10-50mV		
	92	4-20mA		
	93	1-5V		
	94	2-10mV		
	95	0-50mV		

## Standard Spec.

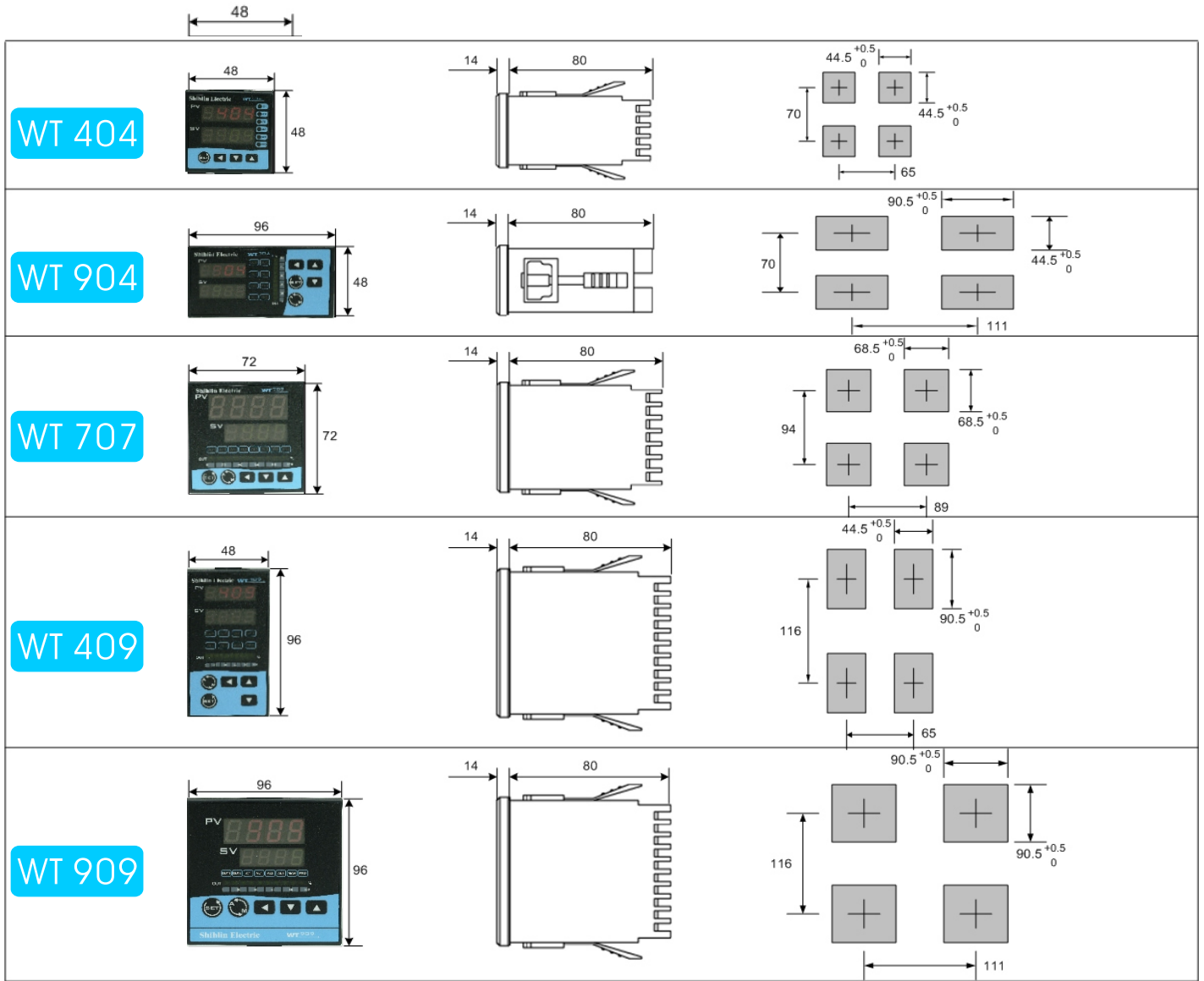
# Specifications

Model	WT-404	WT-904	WT-707	WT-409	WT-909
Dimension	48x48cm	96x48cm	72x72cm	48x96cm	96x96cm
Supply voltage	AC 85-265V , DC24V( Optional)				
Frequency	50/60Hz				
Power Consumption	Approx 3VA	Approx 4VA	Approx 3VA	Approx 4VA	Approx 4VA
Memory	Non-volatile E <sup>2</sup> PROM				
Input	Measurement input. Sample time : 250ms				
TC	K, J, R, S, B, E, N, T, W, PL2, U, L,				
PID	DPT100 , JPT100 , JPT50				
mA dc	4-20mA , 0-20mA				
Voltage dc	0-1V , 0-5V , 0-10V , 1-5V , 2-10V , -10-10mV , 0-10mV , 0-20mV , 2-50mV , 10-50mV				
DP Position	0000 , 000.0 , 00.00 , 0.000 ( available for mA or Voltage dc input )				
Output1	Main control output ( HEAT mode or COOL mode )				
Relay	SPST type	SPDT type	SPDT type	SPDT type	SPDT type
Voltage Pulse	3A , 220V , electrical life : 100,000 time or more(under the rated load). For SSR drive. ON:24V, OFF:0V, maximum load current :20mA.				
mA dc	4-20mA , 0-20mA , maximum load resistance:560Ω				
Voltage dc	0-5V , 0-1V , 1-5V , 2-10V , maximum load current:20mA.				
Alarm1	SPST type	SPDT type	SPST type	SPDT type	SPDT type
Control algorithms	PID , P , PI , PD , ON/OFF(P=0) , FUZZY				
PID range	P:0-200% , I:0-3600 Secs, D:0-900 Secs				
Accuracy	0.2% of FS				
Isolation	Output terminal (control output, alarm, transmission) and input terminal are isolated separately.				
Isolated resistance	10MΩ or more between input terminals and case(ground)at DC500V 10MΩ or more between output terminals and case(ground)at DC500V				
Dielectric strength	1000V AC for 1 minute between input terminals and case (ground) 1500V AC for 1 minute between output terminals and case (ground)				
Operating temperature	0-50C				
Humidity range	50-85% RH				
Weight	Wt404 approx 150g, WT407/WT704/WT707 approx 225g, Wt909 approx 300g				
Display Height	PV:7mm/SV:14m	PV:7mm/SV:7mm	PV:14mm/SV:10m	PV:7mm/SV:7mm	PV:14mm/SV:10m

## Optional Spec.

Model	WT-404	WT-904	WT-707	WT-409	WT-909
RAMP/SOAK Program	2 Patterns with 8 segments each. The 2 patterns can be linked together as 16 segments use.				
Output 2	For heating and cooling control use.				
Relay	SPST type	SPST type	SPST type	SPST type	SPST type
Voltage Pulse	3A , 220V , electrical life:100,000 times or more(under the rated load)				
mA dc	4-20mA , 0-20mA , maximum load resistance:560Ω				
Voltage dc	0-5V , 0-1V , 1-5V , 2-10V , Maximum load current:20mA.				
Alarm 2	SPST type	SPDT type	SPDT type	SPDT type	SPDT type
Alarm 3	X	SPST type	SPST type	SPST type	SPST type
Transmission	Signal type :PV , SV				
mA dc	4-20mA , 0-20mA , maximum load resistance:560 Ω				
Voltage dc	0-5V , 0-1V , 1-5V , 2-10V , maximum load current:20mA				
Remote SV Input	4~20mA, 0~20mA, 0~5V, 0~10V, 1~5V, 2~10V are available				
Communication	Protocol:MODBUS, RS232 , RS485 , TTL Interface:RS232 , RS485 , TTL Baudrate:38400,19200 , 9600 , 4800 , 2400 bps Data bit:8,Start bit:1,Stop bit:1or2,Odd or Even parity				
Water Proof/Dust Proof	IP65				

# External Dimension



## Shihlin Electric & Engineering Corp.

### Head Office

16F, NO. 88, Sec.6, ChungShan N. Rd., Taipei.111

TEL:(02)2834-2662

### Factory Automation

NO.304, ChungLun, HsinFun, HsinChu, 304

TEL:(03)599-5111

### Domestic Branch

#### Taipei Branch

3F, NO.9, Sec.1, ChangAn E. Rd., Taipei, 104

TEL:(02)2514-9822

#### HsinChu Branch

NO.304, ChungLun, HsinFun, HsinChu, 304

TEL:(03)598-1210

#### TaiChung Branch

NO.134-3, Sec. 3, TaiChungKang Rd., TaiChung,407

TEL:(04)2461-0466

#### TaiNan Branch

NO.198, Sec. 1, ChungHwa E. Rd., TaiNan, 701

TEL:(06)237-1246

#### KaoHsiung Branch

NO.250, ChungHwa 2 Rd., KaoHsiung, 807

TEL:(07)316-0228

Agent

[Http://fa.seec.com.tw](http://fa.seec.com.tw)