



WT Series

Digital PID Temperature Controller



WT Series Classical Re-evolution

High Quality & High Performance With Best Process Control

Double Loop

Precise Control

High Reliability



- ✓ Sampling Time 50ms
- ✓ High Accuracy $\pm 0.1\%$
- ✓ 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 WT909.



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).

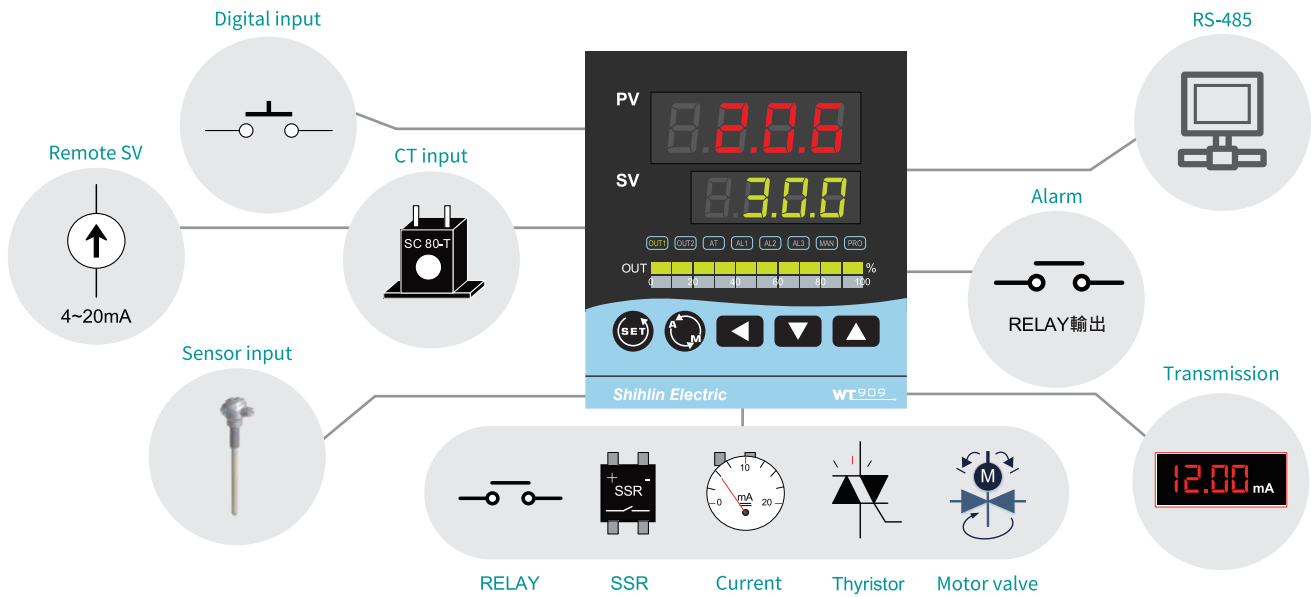


Bar-Graph

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 WT404).

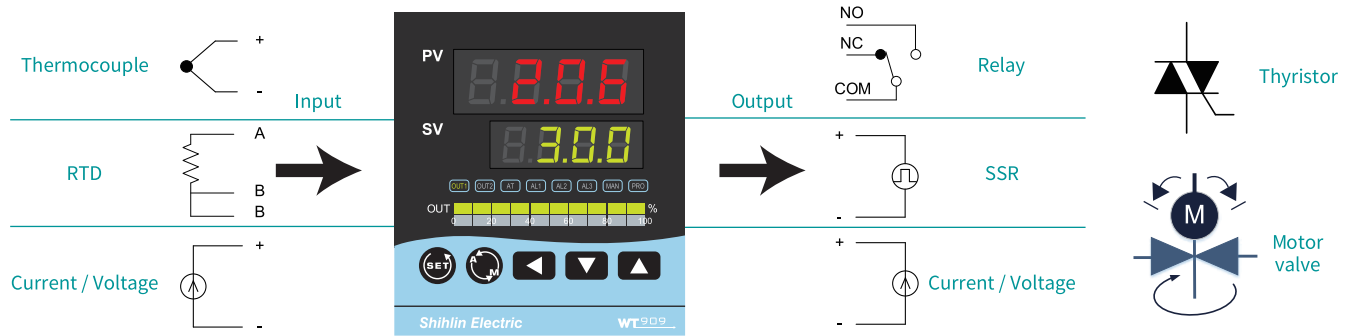


Function block diagram

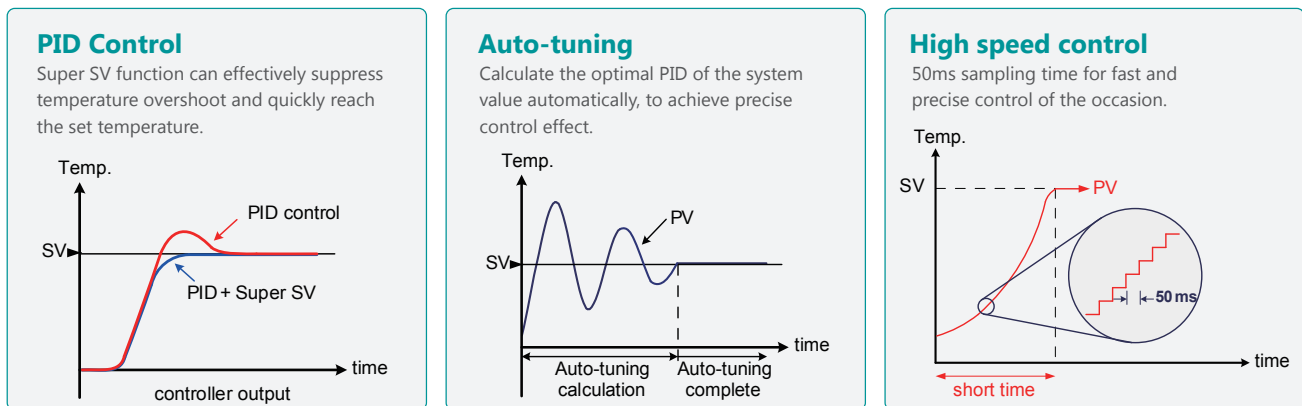


Features

Various I/O Types

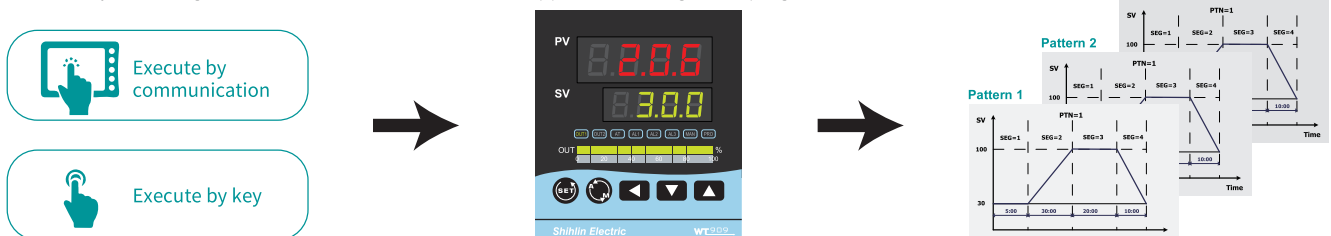


Excellent Control Performance



Powerful Program Control

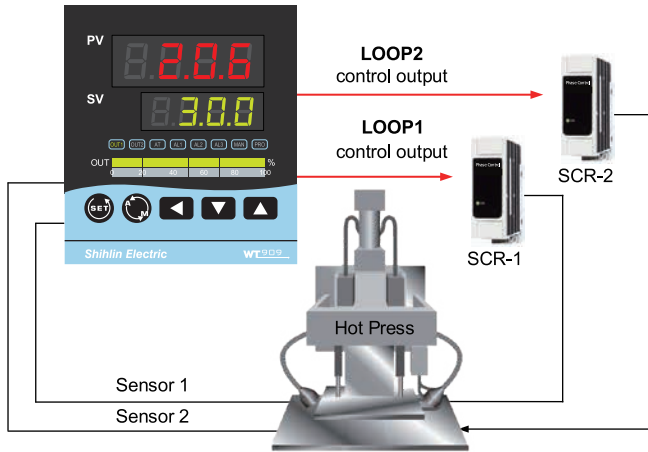
Provides 15 patterns of 10 segments of program control, each segment can be arbitrarily set to ramp, soak, step or cool down temperature, the user can be arbitrary according to the demand, the maximum can support to 150 segments program control.



Features

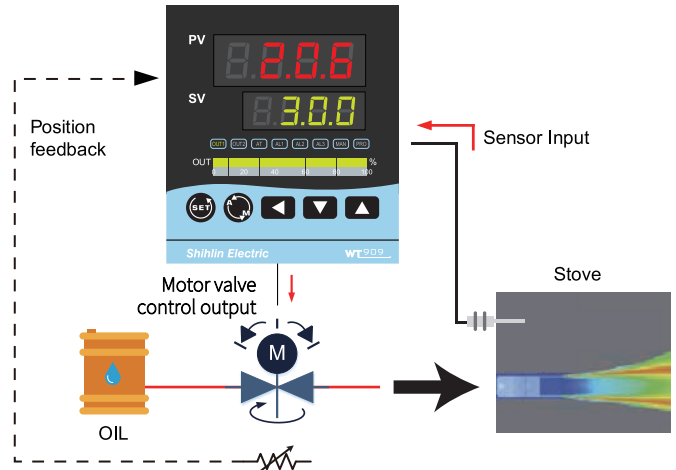
Double Loop Control

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.

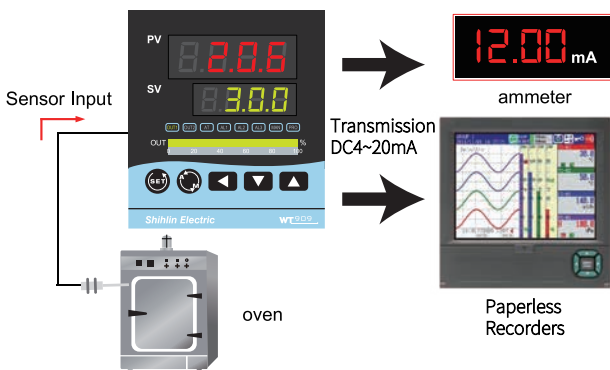


Transmission

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...

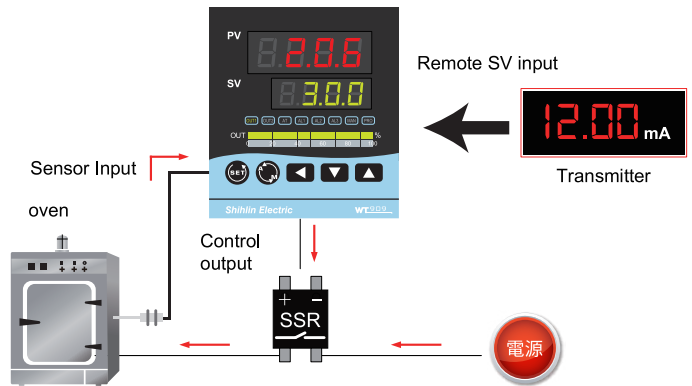


Remote SV

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

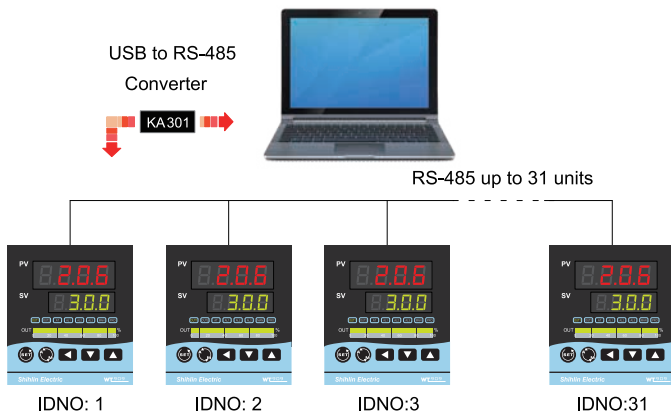
signals : 0~20mA , 4~20mA , 0~5V , 1~5V , 0~10V ...

parameters : SV



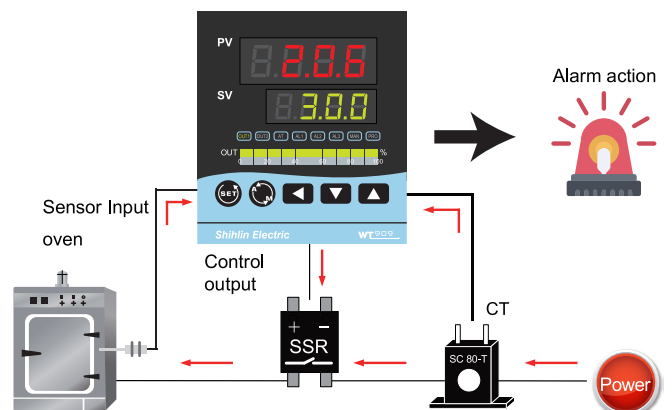
Communication

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



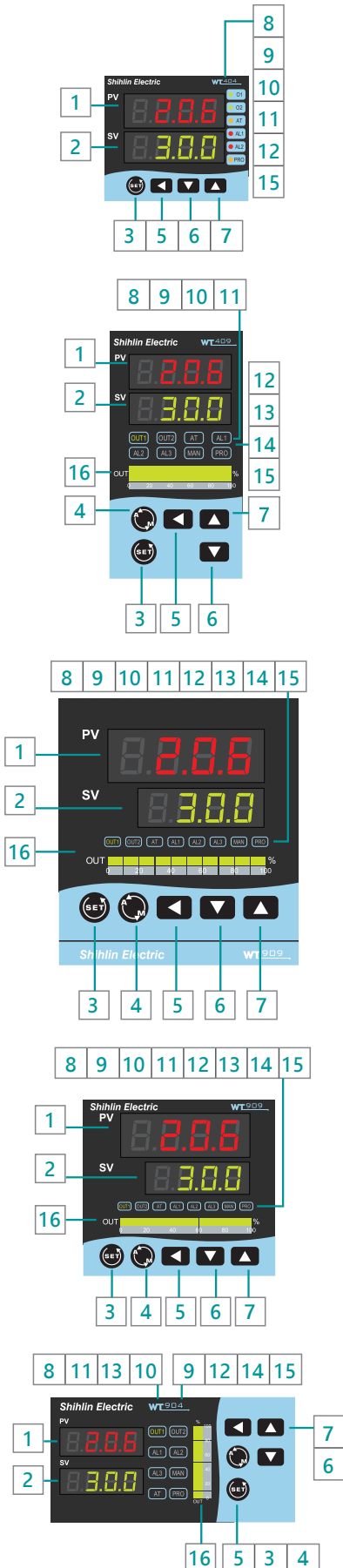
Heater Break Alarm(HBA)

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

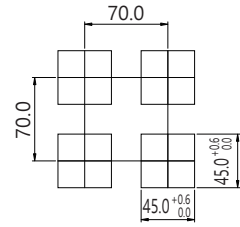
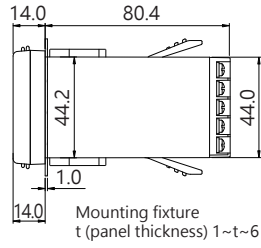
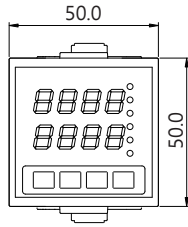
Parts Description



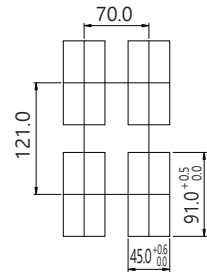
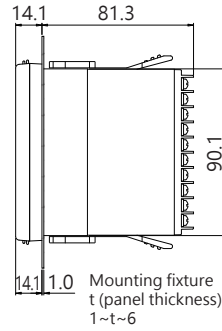
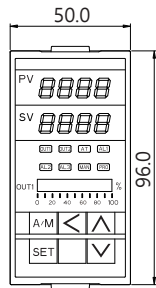
| NO. | NAME | Function |
|-----|-------|---|
| 1 | PV | Indicates PV (measured value) and character information such as parameter codes and error codes (Red) |
| 2 | SV | Indicates SV (target set value) and parameter Values (Green) |
| 3 | SET | Used for parameter calling up and set value registration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

External and Panel Cutout Dimensions

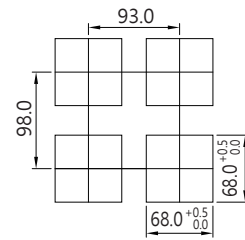
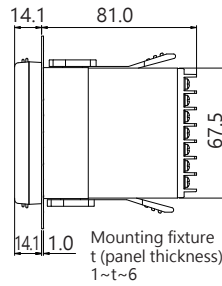
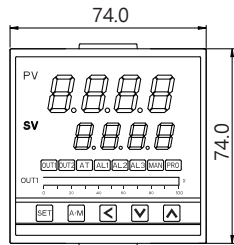
WT404



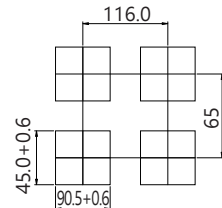
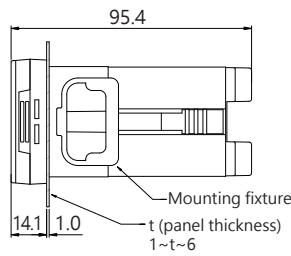
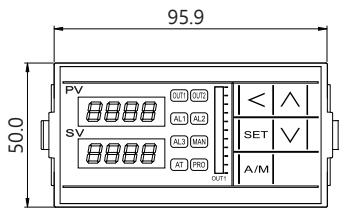
WT409



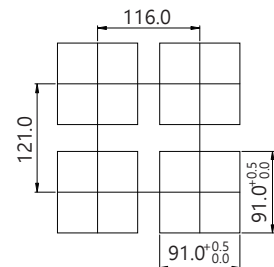
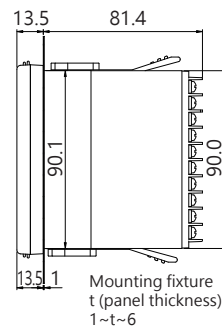
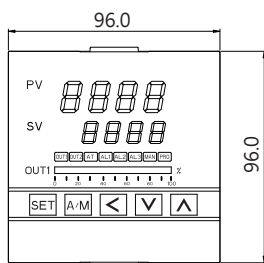
WT707



WT904

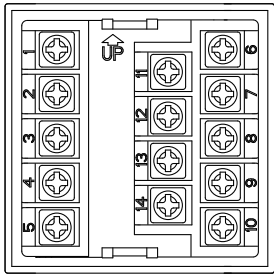


WT909



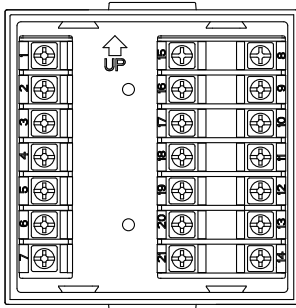
Terminal Arrangement

WT404



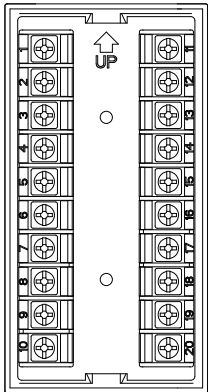
| | | | | | |
|------------------------|--|-----------------------|--|------------------------|--|
| Power | | Communication | | Motor valve | |
| Output-1 | | 1 Φ Zero cross | | Remote/CT Input | |
| Output-2 | | | | TRS | |
| Alarm-1 Alarm-2 | | DI Input | | Input | |

WT707



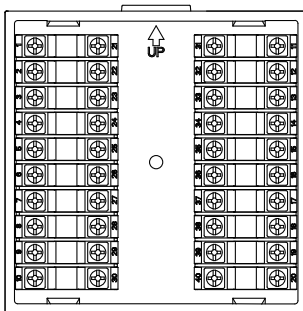
| | | | | | |
|--------------------|--|--------------------------------|--|-----------------------------------|-----------------|
| Power | | Alarm-1 Alarm-2 Alarm-3 | | 1 Φ Zero cross Phase angle | |
| Output-1 | | Communication | | | DI Input |
| Output-2 | | TRS | | Input | |
| Motor valve | | Remote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

WT409/904



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

WT909



| | | | | | |
|--------------------|--|--------------------------------|--|-----------------------------|------------------------|
| Power | | Alarm-1 Alarm-2 Alarm-3 | | 1 Φ / 3 Φ Zero cross | |
| Output-1 | | Communication | | | 1 Φ Phase angle |
| Output-2 | | TRS | | Input-1 | |
| DI Input | | Remote/CT Input | | | Input-2 |
| 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 | WT404 approx. 120g WT409 approx. 170g WT707 approx. 150g WT904 approx. 170g WT909 approx. 230g |
| Dimension (mm) | WT404 48W X 48H X 95.5L (1/16 DIN) WT409 48W X 96H X 95.5L (1/8 DIN) WT707 72W X 72H X 95.5L (3/16 DIN) WT904 96W X 48H X 95.5L (1/8 DIN) WT909 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 · PLII · 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 times 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

| Model | Output 1 | Output 2 | Alarm | TRS | Remote | COMM | Input type | Power | Accessories |
|-------|----------|----------|-------|-----|--------|------|------------|-------|-------------|
| WT404 | 1 | 0 | 1 | 0 | 0 | 0 | 0 1 | A | A |
| WT409 | 0 | 0 | 0 | 0 | 0 | 0 | 0 1 | A | A |
| WT707 | 0 | 0 | 0 | 0 | 0 | 0 | 0 1 | A | A |
| WT904 | 0 | 0 | 0 | 0 | 0 | 0 | 0 1 | A | A |
| WT909 | 0 | 0 | 0 | 0 | 0 | 0 | 0 1 | A | A |

| Option | Description |
|--------|---------------------------|
| 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 |

| Option | Description |
|--------|-------------|
| 0 | None |
| 1 | 1 Set |
| 2 | 2 Sets |
| 3 | 3 Sets |
| A | 0~5V |
| B | 0~10V |
| C | 1~5V |
| D | 2~10V |
| A | HBA |
| B | HBA+AL2 |
| C | HBA+AL2+AL3 |

| Option | Description |
|--------|------------------------------|
| 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) |

| Option | Description |
|--------|-------------|
| 0 | None |
| 3 | TTL |
| B | RS-485(FY) |
| C | RS-485 |

| Option | Description |
|--------|-------------|
| A | AC 85~265V |
| D | DC 24V |

| Option | Description |
|--------|-------------|
| A | Normal |
| B | Program |

See input type table code

※1 Block means optional functions with additional charge
 ※2 HBA :Heater Break Alarm (HBA must use AL 1 as alarm relay)
 ※3 The Second Input WT904/409/909

Combination of options and models

○:Available X:Available * Remote SV function is not available ,if HBA function has been spcified

| Model | OUT1 | | | | OUT2 | Alarm2 | Alarm3 | HBA | Trans- mission | Remote SV | Second input | Communi- cation | Power DC24V | Program |
|-------|--------------------------------|--------------------------------|------------------------|---------------------------------|------|--------|--------|-----|-------------------|--------------|-----------------|--------------------|----------------|---------|
| | 1ØSCR zero cross control | 3ØSCR zero cross control | Motor valve control | 1ØSCR phase angle control | | | | | | | | | | |
| WT404 | ○ | X | ○ | X | ○ | ○ | X | ○ | ○ | ○ | X | ○ | ○ | ○ |
| WT707 | ○ | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | X | ○ | ○ | ○ |
| WT409 | X | X | ○ | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| WT904 | X | X | ○ | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| WT909 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

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 |
| Range °C | 600.0 | 1200 | 400.0 | 1200 | 1760 | 1760 | 1820 | 900 | 1300 | 400.0 | 400 | 2320 | | | | | |
| | -50.0 | -50 | -50.0 | -50 | -50 | -50 | -50 | -50 | -50 | -199.9 | -199 | -50 | -50 | -50 | -199.9 | -199 | 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 | | | | | | | | | | | |



Headquarters:

16F, No. 88, Sec. 6, ChungShan N. Rd., Taipei, Taiwan, 111
 TEL:+886-2-2834-2662 FAX:+886-2-2836-6187

HsinFun Factory (Taiwan):

No.234, ChungLun, HsinFun, HsinChu, Taiwan, 304
 TEL:+886-3-599-5111 FAX:+886-3-5902167

SuZhou Factory(China):

88, Guangdong St, New District, Suzhou, Jiangsu, China 215129
 TEL: +86-512-6843-2662 FAX: +86-512-6843-2599

Official website www.seec.com.tw Automation Division website www.seecfa.com automation@seec.com.tw