



CW991
Slim (24 zone)



CW991
PRO (72 zone)



CW662
(18 zone)

Temperature controller & Sequence timer



TW700
(8 zone)



TW600
(8 zone)

Integrated Control System

- Available to control the temperature and the Sequence Injection Timer
- Available to manage the injection condition for each mold as well the files and log
- The central control system for multi CW991 through the network

Easy To Use

- User friendly Color Touch LCD equipped with MMI
- To prevent the error setting, the authority code is provided to each user

Customization

- The optimized zone for the wide variety of injection environment
- Available to provide the special function upon customer's request

Reliability

- 15 criteria internal safety inspections
- CE certification, UL approved

Features



- The high precision and speed PID control system is applicable to the wide variety of injection environment. ($\pm 0.018^{\circ}\text{F}$ ($\pm 0.01^{\circ}\text{C}$) / 20ms)
- The Self Auto-Tuning mode to sense each heater's property
- The Inter-Lock function that is related to IMM protects Mold and prevents faulty products.
- The Auto Standby function is linked to the injection signal of Injection machine.
- When the temperature control sensor malfunctions, PV/MV Bypass enables the other one to play the role instead.
- The Soft Start function to protect heater from the cold starting
- The Saving system for error occurrence and operating history

TEMPERATURE CONTROLLER

Principal function



Mold control data management

It provides easy control by saving and managing desired parameters.
(Capacity 12G, Min. over 10,000 items)
Can save information on mold control. (Model, Photo, Hot runner Image, Date)



Sequence control / cascade

Sequential valve gate control timer function is added to CW 991 for the integrated hot runner control. (Max. 12 outputs)
3 modes are preprogrammed. (Mode A / B / C)



Error log

Error messages are saved automatically if error occurs. (Max. 5,000 messages)
Data can be saved and synchronized from Main PC to USB.



System diagnosis (Mold test)

The controller has a diagnostic testing tool, which allows you to check that every zone correctly operates. (Wiring, automatically correct T/C poles in case of reverse T/C, excessive current check, etc.)



User friendly data setting

The processor can easily set all data for control. (User and manager login mode)
Easy monitoring for data setting and remote control are available.



Help (Interface)

User manual is embedded in the panel PC for easy use.
Language - English (Option available for multi languages)

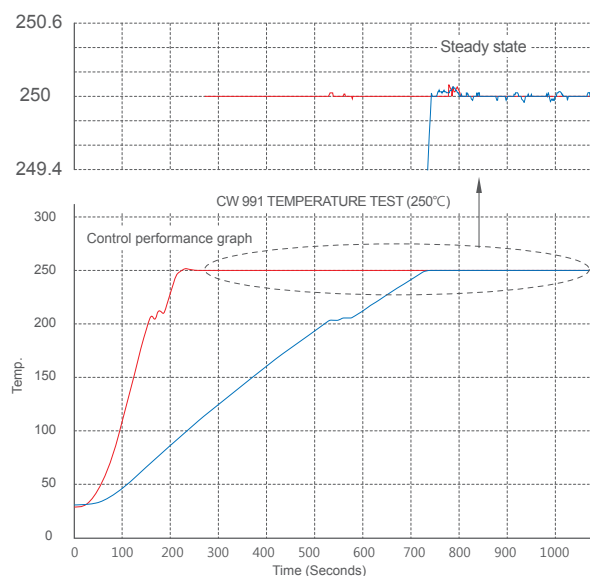
Precise control

Precise temperature control

- CW 991 automatically conducts auto tuning when controlling heater temperatures, and controls temperatures precisely and stably. (Precision : within $\pm 0.1^{\circ}\text{C}$)
- No more over shooting problem during heating up. (within 1°C / less than 1 times)
- Excellent response time offers fast and precise temperature control when changing the target temperatures. (Frequency : 100 ms)
- CW 991 interacts with ambient temperature. It's best solution for high temperature molds. (steam mold, electric heat mold, etc)

A variety of applications

- It precisely controls and performs great, especially with sensitive heaters such as ultra mini heater.
- It can precisely control sensitive heaters.
- Control range : $0 \sim 500^{\circ}\text{C}$ (Option available for 999°C)



Temperature display



Text view

- The data is displayed as text values.
- This screen allows you to view target and actual temperatures, output rates and currents of heaters. Furthermore, it allows you to change data setting values.



Bar chart view

- The data is displayed in a graphical format.
- This screen allows you to view target and actual temperatures, output rates and currents of heaters.
- Switch on or off individual zone by touching bar graph.



Picture view

- The data is displayed in an image format.
- This screen allows you to add and delete user selected zones on the image.



Digital view

- The data is displayed in grid format.
- To change the data setting from Basic Setting Screen by touching individual grid.

Sequence timer [Optional timer]



Timer setting screen

- To change sequential mode and display a unit of 12 output Sequence Injection timer.
- To open or close each valve gate individually to precisely control the material flow front.
- To manually open or close the selected valve gates or all valve gates at the same time.

Mode A



Mode B



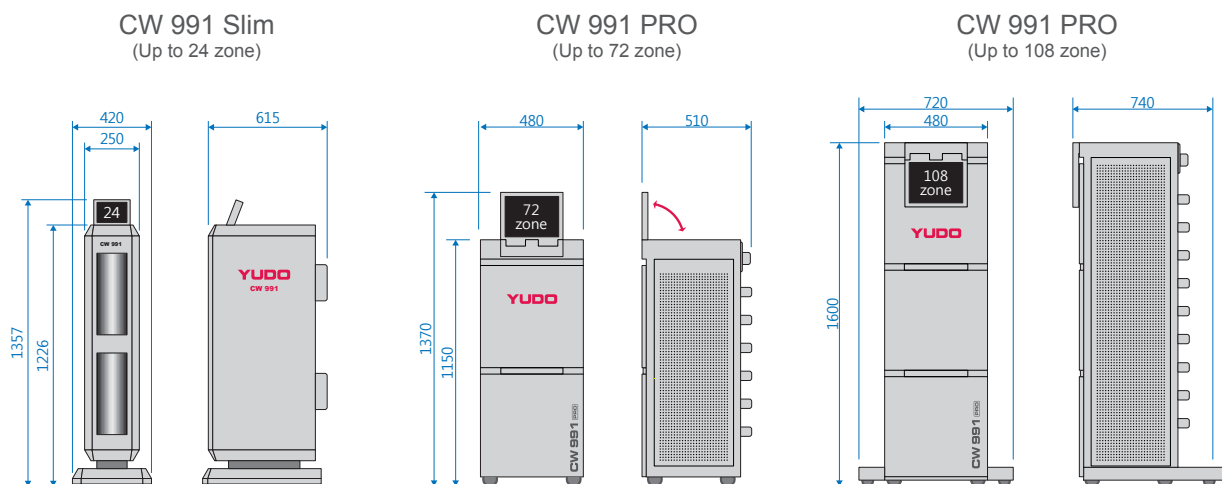
Mode C



t1 : Delay 1 time / t2 : Open 1 time / t3 : Delay 2 time / t4 : Open 2 time

TEMPERATURE CONTROLLER

Dimensions



Model	Cabinet sizing	Max. capacity	Remarks
CW 991 Slim	Max. 24 zones	100A	· 7 inch wide touch panel / Optional 16 output sequence timer
CW 991 PRO	Max. 72 zones	150A	· 12.1 inch touch panel / Optional 16 output sequence timer
	Max. 108 zones	225A	

※ We are available for supplying Max 162 zones CW991 as a special type when customer request over 108 zones.

Specifications

HMI

Display console	12, 15" TFT Monitor (24 Zone - 7" wide)
Input device	4 wire resistive touch panel
Language	English

Input

Zone	6 Zone/Unit
Sensor type	Thermocouple TC-K, TC-J (IEC-584)
Control range	0.0 ~ 500.0 °C (32~932°F)
Scan rate	100 ms
Scan accuracy	± 0.5 % of F/S
Display resolution	0.1 °C (0.18°F)
Compensable temperature variation	± 2.0 °C (-15 ~ 65°C)

Output

Zone	6 Zone / Unit
Output mode	Phase control, Zero cross control
Output resolution	Phase control : 1,000 Res. Zero cross control : 120 Res. (60Hz), 100 Res. (50Hz)
Max. admissible current	15A / Zone, 50A / Unit(6 Zone)
Period of renewal	1 sec.

Environment

Operating temperature	0 ~50°C (32~932°F)
Operating humidity	20 ~ 90% RH (NO condensing)
Storage temperature	-25 ~ 70°C (~158°F)
Insulation resistance	500VDC, Over 20MΩ (Input power-field ground, Input/Output-field ground)
Withstand voltage	1,500Vac 50/60Hz 60sec (Input power-field ground, Input/Output-field ground)
Vibration resistance	10 ~ 55Hz, Bandwidth 0.75mm, 3directions 4swings, 5min/swing
Impact resistance	147m/s ² , 3directions 3times
Magnetic effect	Below 400 AT/m
Warming-up time	Over 30 min

Power

Voltage	3 phases 4 lines 380V, 3 phases 3 lines 220V
Frequency	50/60Hz
Consumed power per cabinet configuration	154W,175W, 217W, 260W, 315W (24, 48, 72, 96, 120 Zone - 220VAC)

Data communication

Protocol	EIA-RS485/422, USB V2.0 (HOST, SLAVE)
Max. number of connection	Max. 21 IDs (include master) Repeater is required if additional IDs are connected.
Communication method	Half- duplex 2 wire
Communication speed	19,200 bps
Port parameter	NONE PARITY, 8 DATA, 1 STOP BIT
Communication distance	About within 1.2 km (depending on the installation environment)

Sequence timer [Optional timer]

Input	Injection signal	24 VDC
	Voltage	110 VAC, 220 VAC
Output	Relay	24VDC (Max. 100mA) x 12 outputs (valve gates) 110VAC (Max. 1A) x 12 outputs (valve gates) 220VAC (Max. 1A) x 12 outputs (valve gates)
	System rule	Mode
		Mode A : Set delay 1 time Mode B : Set delay 1, Open 1 times Mode C : Set delay 1, Open1, Delay 2, Open 2 times
Misc.	Setting time unit	0.00 ~ 999 sec.
		Independent running.
		Detect and display solenoid value output voltage. Open all valve gates or individual valve gate.

※ CW 991 48 zone model use 8 outputs sequence timer instead of 12 outputs sequence timer.

Easy

- Easy to manage and control
- The wide and uniform Visibility with the High-brightness LED

Intelligent

- The independent temperature controller is applicable to the wide injection ranging from Low voltage nozzle to large capacity manifold. (2~24 Zone)
- The Inter-Lock function that is related to IMM protects Mold and prevents faulty products
- The Precise temperature control within $\pm 0.018^{\circ}\text{F}$ ($\pm 0.01^{\circ}\text{C}$) tolerance
- The Soft start function to protect heater from the cold starting
- The Manual & Auto Standby function

Fast

- The Self Auto Tuning mode for fast temperature rise and its stabilization (Quick/Full tuning)

Reliability & Safety

- Highly reliable hardware which has the Surge/over-voltage protection circuit.
- 17 internal safety inspection function
- CE certification, UL approved

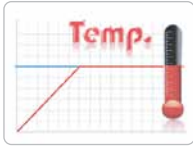
Features



- 1) - Optimal speed control in any type of heater
(From low voltage nozzle to high capacity manifold)
 - Quick tuning & Full tuning
- 2) - High precise measurement within $\pm 0.01^{\circ}\text{C}$
 - Quick response by implement high speed sampling
- 3) - High-brightness LED with uniform and broad visibility
 - Shutdown input power in the case of over voltage
 - Apply surge protector (3,600 Vac)
 - Accurate current detection using high precise CT ($\pm 0.2\%$)
 - Stable system with better external noise tolerance

TEMPERATURE CONTROLLER

Principal function



Precise temperature control

- It provides high precise measurement within $\pm 0.01^\circ\text{C}$ and operation to control temperature stably.



Standby function

- This function is to control the output power by setting values in case of production pause for a while when the setting time is up, it recovers the original value.



Soft-Start

- When power on, this function protects heaters from excessive output.
- Soft-Start helps heaters to prevent humidity-caused and over-current-caused damage by slow preheating.



Manual temperature calibration function

- This is a function to compensate the temperature at the setting mode by manual in case of abnormal difference between PV and SV temperatures.



Parameter protection function

- This security feature helps to prevent accidental changes to parameter settings.



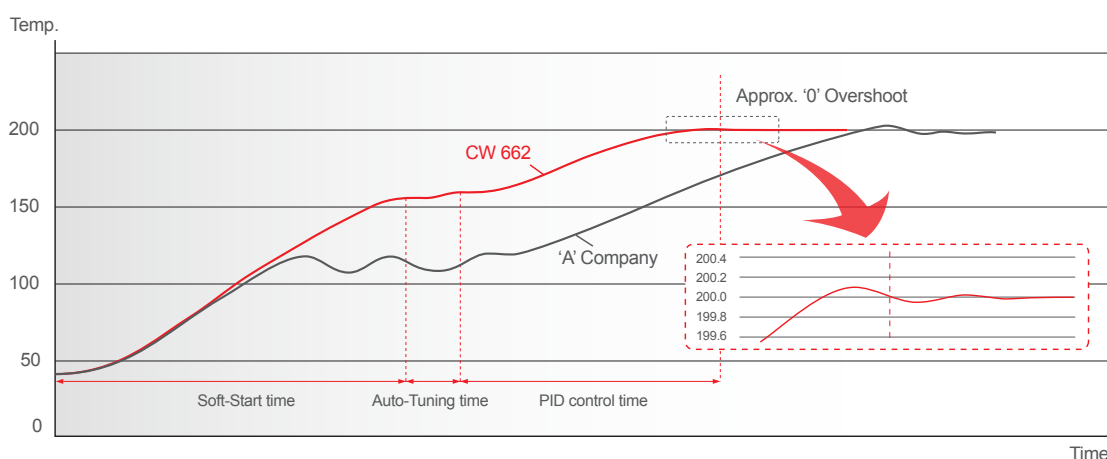
Thermocouple failure indication

- Allows users to check the type and status of thermocouple.
- When thermocouple disconnected or polarity reversed during the operation, the operation automatically terminates the output.

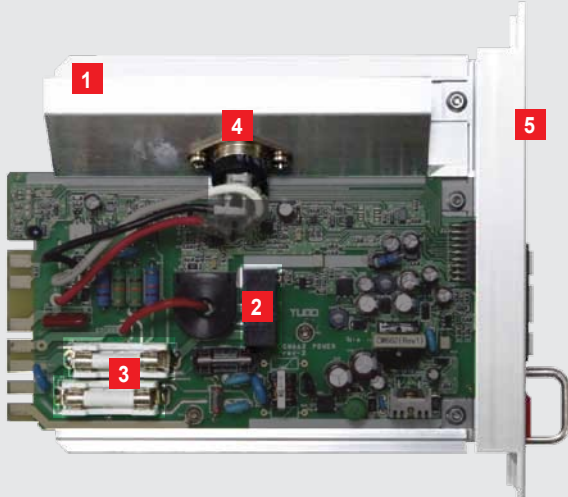
Heater failure indication

- In case of short-circuit & disconnection over-current, it shows error signs and terminate the output.

Algorithm



Hardware upgrade



1. Heat-sink plate

- High capacity heat-sink plate prevents triac damage by heat.

2. Ground fault self-inspection

- This function is to protect heaters and operators by automatically stopping over-current resulted from a short circuit.
- Relay can automatically stop leaked current to protect controller's electric circuit in case of emergency.

3. Fuse

- Fuse holder application - minimizing fuse breakdown by isolating contact resistance rise.
- 32bit CPU application - minimizing fuse breakdown by stopping over-current spontaneously.

4. Triac

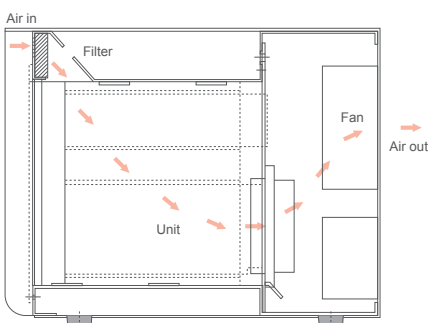
- High capacity triac(30A) application - minimizing triac damage caused by over-current.

5. Display

- Bright and uniform display and broaden visibility with high-brightness LED
- Thermocouple type (IC/CA) display
- Temperature symbol display (°C, °F)



Main frame



1. CW 662 main frame achieves high durability to protect the control module, by double cell structure.
2. The new frame achieves high quality air ventilation system.
3. A PET filter is installed to the ventilation holes to clean the circulation air.
4. Reinforced guide rail in the frame ensures the control module mounted in the frame smoothly and rigidly.
5. The material of filter : PET Thickness : 10mm
Heat resistance : 100°C Capacity of filter : 70

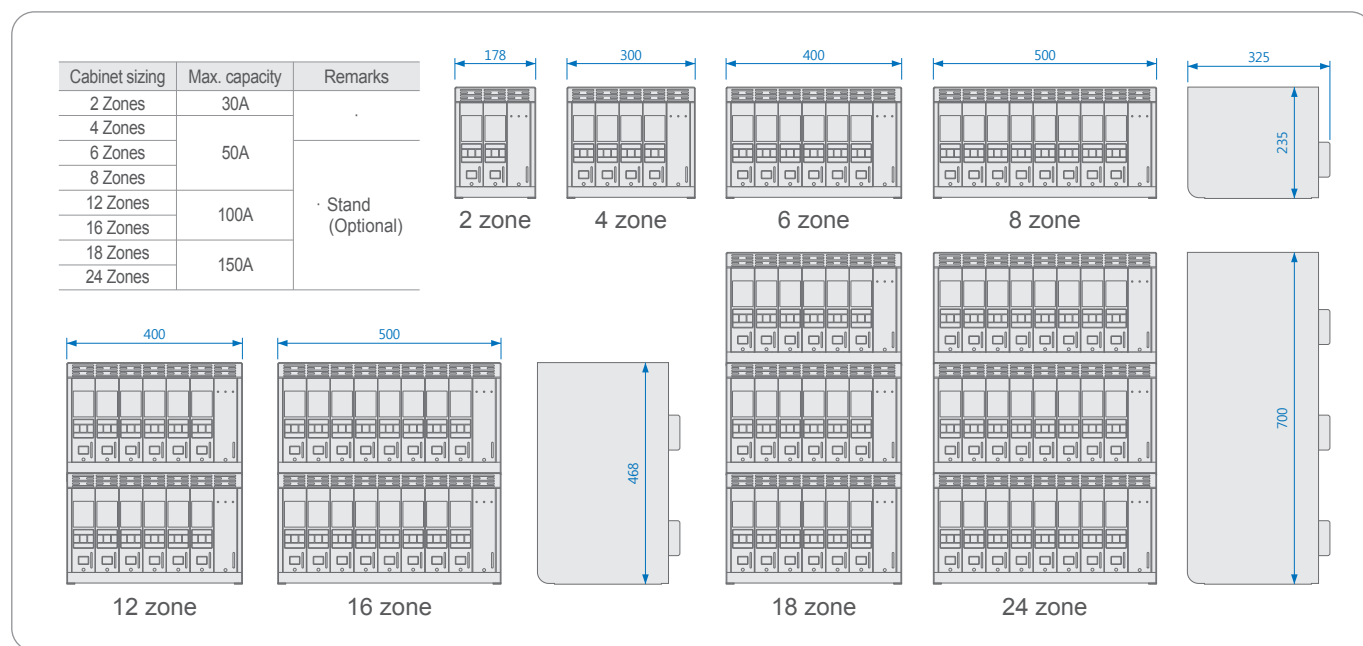
TEMPERATURE CONTROLLER

Mode parameters

Mode parameters can be selected according to the operating conditions.

PV FND	Description	SV panel	
		Feasible range	Factory-set
AL-L	Low process temperature alarm	± 99	0 °C
AL-H	High process temperature alarm	± 99	0 °C
Unit	Calibration of temperature	0 / 0.0	0
Stby	Users set standby time	St_t : 0~23h 59min	St_t : 1.00(1h)
	Users set standby temperature	StSV : 0~400 °C	StSV : 0~50 °C
CdsP / FdsP	Users selects temperaure unit (°C or °F)	Cdsp, Fdsp	Set by, Customer order
LoCK	It prevents accidental or unauthorized changes to parameter settings.	On, Off	Off

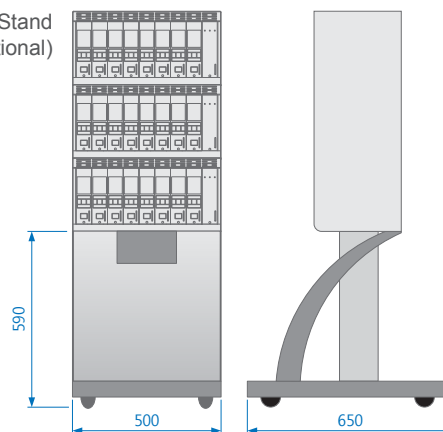
Dimensions



Specifications

Input voltage	Free voltage 100V ~ 240 V(50 / 60 Hz)
Thermocouple type	TC-K (IEC-584), TC-J (IEC-584)
Calibration of temperature	$\pm 0.5\%$ of F/S
Output mode	Phase angle control, Zero cross control
Capacity	15A(Max 16.5A), 1 zone/Unit
Ambient temperature range	0 ~50°C (32~122°F)
Humidity	20 ~ 90% RH
Temperature control method	PID control
Approved	CE UL/cULus

CW 662 Stand (Optional)



Removal or re-positioning of weld line.

Control of the injection volume by gate operation time.

Improvement on flash and short-shot.

TW700 Pendant type timer

Features



TW 700 (8 zone)

- Simultaneous control on the max. 8 gates.
- Simple operation to change the value and setting time.
- Display the solenoid valve output voltage.
- Support various operating modes on each gate. (MODE A / B / C)
- Display the working condition on a real-time basis.
- Setting-data memory function in a power-off status.
- Software power on/off application.
- Manual on/off control function on each or all gate.
- Solenoid valve output voltage AC220V, DC24V available. (pneumatic solenoid only)
- Precise time control. (Min 0.01sec. ~ Max 999sec.)
- Initialization function.
- Smart and solid design.

Specifications

Supply voltage	1 Phase AC(100 ~ 250VAC), 50/60Hz
Voltage bandwidth	Stable within $\pm 20\%$ supply voltage swing
Supply earth-leakage trip	10mA per individual zone ground fault monitoring (note: this is for tool protection)
Consumption current (idle state)	Max. 11VAC
Injection signal input voltage	DC24V, AC220V (Free voltage)
Display resolution limit	0.01sec
No. of zones	8 zones
Relay output mode	Relay arbeit contact
Output (solenoid) capacity	2.5A @ DC24V (1A @ AC220V)
Output (solenoid) voltage	DC24V, AC220(Only for pneumatic solenoid) (*AC solenoid valve output voltage is up to AC input power.)
Consumption current (solenoid)	Max 100mA per zone
Operating temperature	0~50 °C (32~122°F)
Operating humidity	0~90% R.H(Non-condensing)

TW600 Cartridge type timer

Features



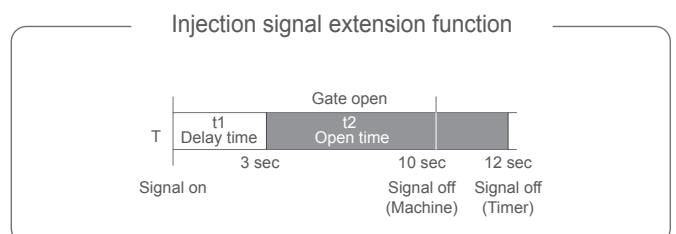
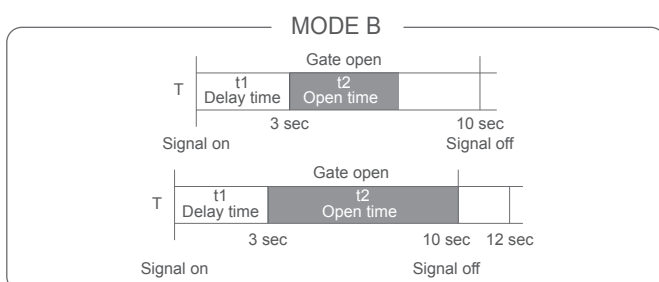
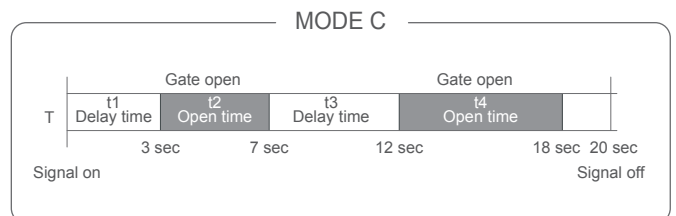
TW 600 (8 zone)

- Simple operation to change the value and setting time.
- Display solenoid valve output voltage.
- On/Off function manual gate.
- Solenoid valve output voltage.
(Pneumatic : AC 220V / DC 24V [Hydraulic is optional])
- Support various operating modes. (MODE A / B / C)
- Display the working-condition on a real-time basis.
- Setting-data memory function on a power-off status.
- Precise time control application (Min 0.01sec. ~ Max 999sec.)
- Power on/off based on the software.

Specifications

Main power supply (Timer case)	AC(85~264VAC),50/60 Hz
Injection signal input power	DC 24V, AC 110V, AC 220V (Free voltage)
Solenoid valve output voltage	DC 24V, AC110V, AC220V *AC solenoid valve output must be same with AC input power .
Operating temperature	0℃~ 50℃
PCB structure	
① Power board	Power PCB
② Relay board	Relay (Solenoid valve on/off)
③ CPU board	MPU, Out signal input/output, Display, Switch signal input
④ Front board	Solenoid valve output display (24V or 220V)
⑤ Mother board	DC main power distribution and connector

Mode operation (TW 700 & TW 600)



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