熱澆道專用溫度控制器

HOT RUNNER SYSTEMS TEMPERATURE CONTROLLERS

MP

契益有限公司

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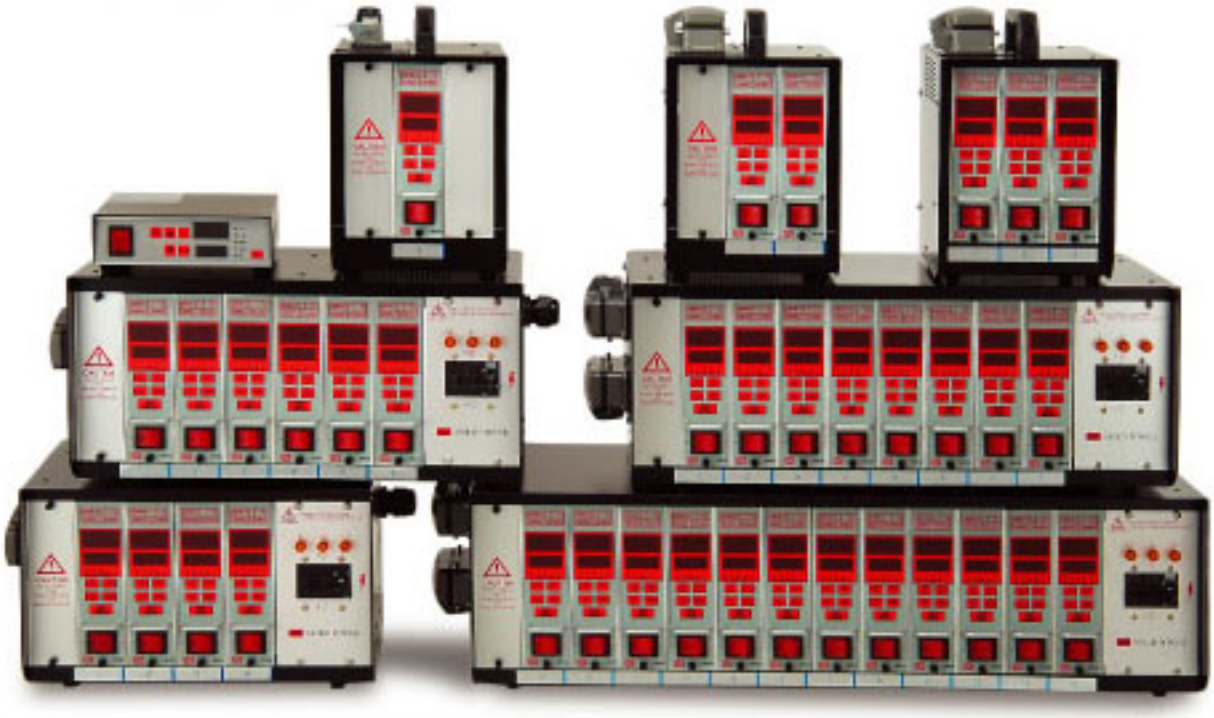
MPR型全系列

MPR特性說明

1.PID微電腦控制雙顯示幕同時指示現在溫度，控制精度±1℃。
2.自動或手動功能設定，輸出功率值等，皆可由溫控表上按鍵直接操控指示。
3.每點皆配備雙向高速熔絲保護及自動預熱除濕功能，以確保電熱壽命更長久。
4.箱體結構強度高，機電組件由德、法、日進口，皆符合安規認證標準。



溫控器至模具上電熱感溫纜線規格

6點及12點溫控器及時序控制器組合架

6點: CG-0306　　12點: CG-0312

MPR型溫控器標準規格及配備

	型號 TYPE	MPR 1001	MPR 1501	MPR 1502	MPR 1503	MPR 1504	MPR 1506	MPR 1508	MPR 1512
	點數 NO. / 項目 ITEM	一	一	二	三	四	六	八	十二
1	每點輸出功率 OUTPUT POWER	240V 2400W 10AMPS	240V 3600W 15AMPS	240V 3600W 15AMPS	240V 3600W 15AMPS	240V 3600W 15AMPS	240V 3600W 15AMPS	240V 3600W 15AMPS	240V 3600W 15AMPS
2	輸出方式 OUTPUT MODE	TRIAC 單相輸出	TRIAC 單相輸出	TRIAC 單相輸出	TRIAC 單相輸出	TRIAC 單相輸出	TRIAC 單相輸出	TRIAC 單相輸出	TRIAC 單相輸出
3	輸出插座 (德規) OUTPUT PIN (DIN)	5 PINS ×1set	5 PINS ×1set	16 PINS ×1set	16 PINS ×1set	16 PINS ×1set	24 PINS ×1set	24 PINS ×2set	24 PINS ×2set
4	保護跳脫 PROTECTED TRIP	途 熔 FUSE	途 熔 FUSE	途 熔 FUSE	途 熔 FUSE	途 熔 FUSE	途 熔 FUSE	途 熔 FUSE	途 熔 FUSE
5	總斷路器容量 MAIN CIRCUIT BREAKER	—	—	—	—	400V 3P 50A	400V 3P 50A	400V 3P 63A	400V 3P 63A
6	區點開關 (跷板開關) ZONE SWITCH	250V 2P 16A ×1set	250V 2P 16A ×1set	250V 2P 16A ×2set	250V 2P 16A ×3set	250V 2P 16A ×4set	250V 2P 16A ×6set	250V 2P 16A ×8set	250V 2P 16A ×12set
7	電源纜線 POWER CABLE	1.5mm² ×3C ×3m	3.5mm² ×3C ×3m	3.5mm² ×3C ×3m	3.5mm² ×3C ×3m	5.5mm² ×4C ×4m	5.5mm² ×4C ×4m	8mm² ×4C ×4m	8mm² ×4C ×4m
8	輸出纜線 OUTPUT CABLE	3米雙頭 5P插頭 ×1條 3m Cable 5P Connector × 1 pc	3米雙頭 5P插頭 ×1條 3m Cable 5P Connector × 1 pc	3米雙頭 16P插頭 ×1條 or 3米16P 對5P插頭 ×2條 3m Cable 16P Connector ×1 pc or 3m 16P w/ 5P Connector ×2 pc	3米雙頭 16P插頭 ×1條 3m Cable 16P Connector × 1 pc	3米雙頭 16P插頭 ×1條 3m Cable 16P Connector × 1 pc	3米雙頭 24P插頭 ×1條 3m Cable 24P Connector × 1 pc	3米雙頭 16P插頭 ×2條 3m Cable 16P Connector × 2 pc	3米雙頭 24P插頭 ×2條 3m Cable 24P Connector × 2 pc
9	輸出纜線(重量) OUTPUT CABLE (WEIGHT)	5 to 5 1 Kgs	5 to 5 1 Kgs	16 to 16 2 Kgs 16 to 5×2 2 Kgs	16 to 16 2 Kgs	16 to 16 2 Kgs	24 to 24 2.5 Kgs	16 to 16 ×2pcs 4 Kgs	24 to 24 ×2pcs 5Kgs
10	外型尺寸(寬、深、高) OUTER DIMENSION (L×W×H)	180× 275×65	180× 225×230	180× 225×230	180× 225×230	360× 290×230	460× 290×230	560× 290×230	770× 290×230
11	溫控器(重量)淨重 CONTROLLER WEIGHT(NET)	1.4 Kgs	3 Kgs	4 Kgs	5 Kgs	14 Kgs	16 Kgs	20 Kgs	26 Kgs
12	備註 REMARK								

set = 組　　m = 米

●特色說明

◆系統採高速CPU，控制精確，穩定性高，速度快。
◆面板採用高亮度LED，一目了然，操作簡便。
◆具備自我偵錯功能，追查容易。
◆溫度採PID控制，準確度高。PID參數可外調或自動調整。
◆硬體檢測感溫線斷線，電熱斷線警報。
◆可轉成電壓輸出控制符合不同的控制型態。
◆可對電熱器做除濕設定保護電熱延長壽命。
◆K、J感溫器皆可使用。
◆上下限可設定。

●配件列表

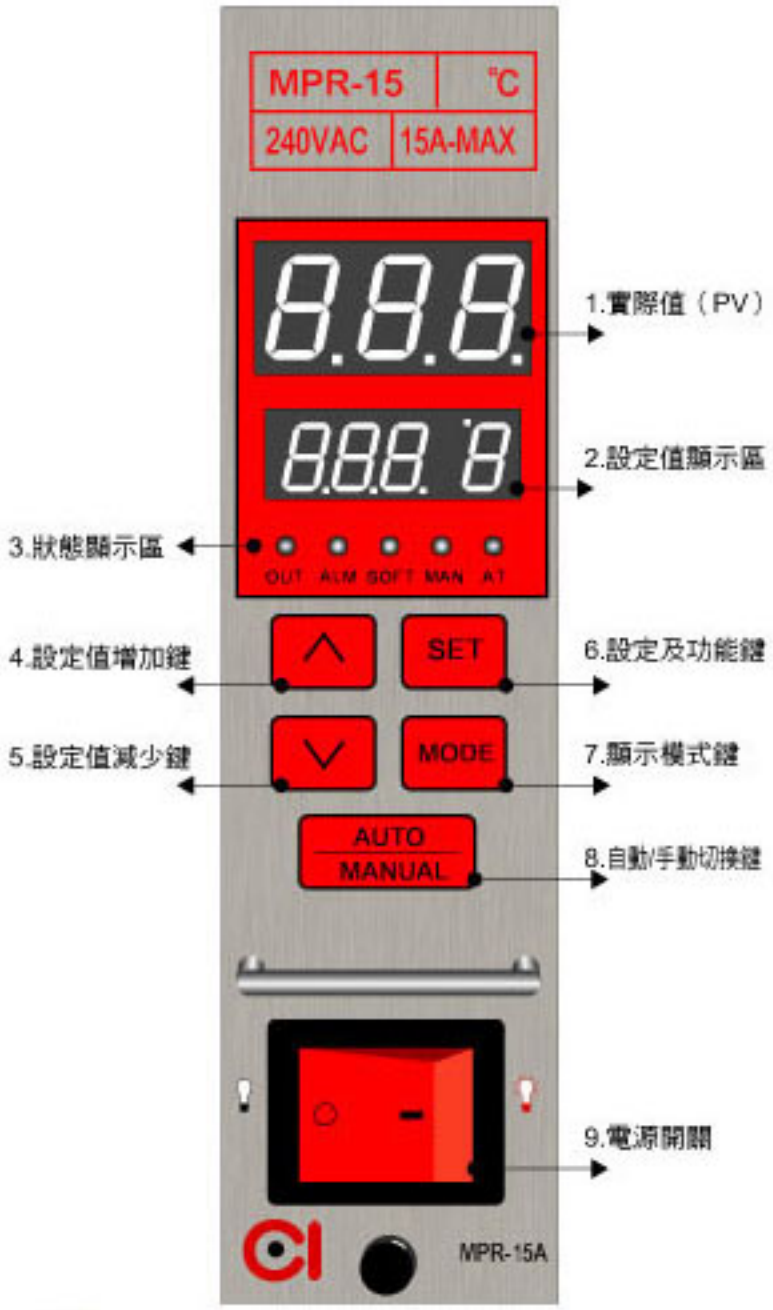
當收到MPR-15熱流道控制器，請確認在運輸過程中有無受到損傷，拆封後請檢查有無以下配件：

MPR-15　控制器主機　x1
使用說明書(本書)　　x1

●系統各部介紹

◆MPR-15 面板說明：

1.	此7-SEG顯示 實際溫度或警告代號及功能代號。
2.	此7-SEG顯示，設定溫度或功能設定值及電流和輸出百分比。
3.	狀態指示燈由左至右分別表示輸出 警告，除濕，手動，自動溫度調整，等功能動作與否。
4.	此鍵用於增加設定值。
5.	此鍵用於減少設定值。
6.	此鍵用於開始及輸入設定溫度,或進入功能設定項。
7.	此鍵用於顯示電流或輸出百分比。
8.	此鍵用於切換自動或手動模式。
9.	電源開關。



●資料設定

◆基本設定模式：

在一般狀態下：

按 ^ 增加溫度設定值，若一直按住則會快速累加，直到最大設定值。

按 v 減少溫度設定值，若一直按住則會快速減少，直到最小設定值。

按 SET 則會將改變之設定值溫度儲存到記憶體中，此時設定值停止閃爍溫控器開始以新設定值控溫，按其他鍵則可放棄輸入回到一般狀態。若進入設定狀態下經過12秒後沒有按下任何按鍵，則會自動退回一般狀態，不會儲存設定值，設定值停止閃爍。

◆功能設定模式：

在一般狀態下，按住 SET 鍵1秒不放則進入功能設定模式此時實際值顯示區顯示F01, 設定值會閃爍即可開始設定功能此時可:

按 ^ 設定為ON。（啟動功能）

按 v 設定為OFF。（關閉功能）

按 SET 則會將改變之設定值儲存到記憶體中，並進入下一功能選項

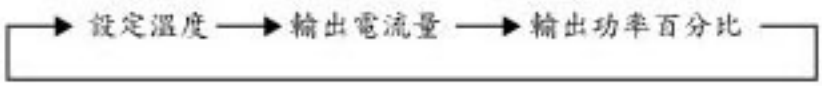
若欲結束功能設定則可按 SET 1秒或其他鍵結束輸入回到一般狀態,同基本設定一樣如果12秒未按下任何按鍵則會自動退回一般狀態，不會儲存設定值, 設定值停止閃爍。

●功能參數列表：

代號	功能說明設定	參數值	
		出廠預設	範圍
F01	除濕功能啟動 除濕功能啟動為ON時溫控器將於開機時自動將輸出電壓由0V緩慢上升直至溫度為100℃並保持固定時間（5分鐘）後才開始正常控溫，當進行除濕時實際值顯示區之7-SEG小數點將會亮起。	OFF	ON/OFF
F02	自動/手動切換 當自動/手動切換為OFF時溫控器將於自動控溫模式設定值顯示℃當自動/手動切換為ON時溫控器將不控溫但輸出與設定值相同比例之電壓保持電熱溫度。	OFF	ON/OFF
F03	PID自動調整啟動 當PID自動調整啟動ON時，溫控器將會進入自動調整模式此時實際值顯示區將會閃爍直至自動調整成功，若自動調整時有改變設定溫度，或任何警告發生則自動調整將會失敗。	OFF	ON/OFF
F04	資料鎖定啟動 當資料鎖定啟動ON時，溫控器將無法輸入任何資料。	OFF	ON/OFF

●顯示模式切換說明

在一般狀態下，每按一下 [MODE] 鍵，設定視窗會依下列作顯示循環。



●MPR-15 指示燈狀態說明

代號	訊息說明
OUT	電熱輸出開啟～當指示燈亮起時表示電熱有輸出。
ALM	警報信號～當指示燈亮起時表示有警報輸出，警報種類請參考下表。
SOFT	除濕功能動作～當指示燈亮起時表示除濕功能動作中。
MAN	手動設定輸出電熱模式～當指示燈亮起時表示輸出電熱功率由使用者自行設定。
AT	AUTO TUNING 控溫參數自動調整動作～當指示燈亮起時表示進入自動調整模式。

●錯誤訊息

MPR-15檢查出有下列情況發生時將會在實際值顯示區閃爍顯示出警告代號,且ALM警告燈將會亮起來

代號	錯誤訊息顯示說明
E01	感溫線斷線 當感溫線斷線或未接時將顯示此代號，溫控器停止控溫，但手動模式可動作
E02	加熱器斷線 當加熱器斷線或未接時將顯示此代號.，溫控器停止控溫
E03	溫差異常 當實際溫度超出（設定值（+/—）RU/警告範圍（F05）將會顯示此警告
E04	超出本機最高溫 當實際溫度超出本機最高溫（450˚C），將會顯示此警告，溫控器停止控溫
E05	PID自動調整失敗 當溫控器進入自動調整模式時,若改變設定溫度,或任何警告發生則自動調整將會失敗且顯示此代號
E06	感溫線反接 當感溫線反接即開始加熱後始溫度反方向下降至一定值後顯示此警告

●規格表

項　目	規　格	備　註
輸入電壓Operating Voltage	85V ~ 250VAC	
輸入頻率Operating Freq.	50~60Hz	
操作溫度Operating Temperature	0~55℃	
儲存溫度Storage Temperature	-40℃-70℃	
保險絲規格 Fuse	15A/250V 32mm 1/1000 sec	ABC-15*2
感溫線型式Sensor Type	TC：K，J TYPE	
感溫範圍 Sensor Range	0 to 470℃	
取樣速度 Sampling Rate	20HZ	
感溫正確率Temperature Accuracy	+/- 0.3% of SPAN	
輸出電流Control Output Device Type	Triac 15A at 110/220vac	

●進階功能資料設定（非熟悉操作使用人員，請勿隨意進入更改）

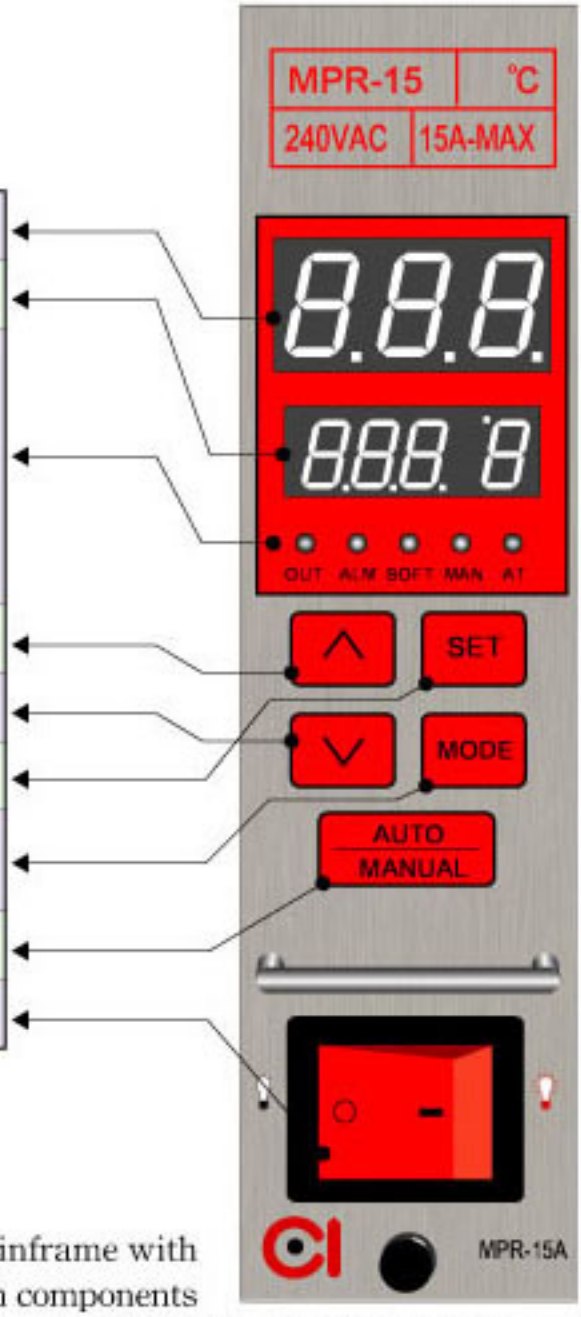
在一般狀態下，按住 SET 鍵1秒不放進入功能設定模式實際值顯示區顯示F01，此時 SET 鍵不放再同時按 ◀RST 鍵不放一秒 進入進階功能設定模式此時實際值顯示區顯示F05。
按 ∧ 增加設定值，若一直按住則會快速累加，直到最大設定值。
按 ∨ 減少設定值，若一直按住則會快速減少，直到最小設定值。
按 SET 則會將改變之設定值儲存到記憶體中，並進入下一功能選項。
若欲結束功能設定則可按 SET 1秒或其他鍵結束輸入回到一般狀態，同基本設定一樣如果12秒未按下任何按鍵則會自動退回一般狀態，不會儲存設定值，設定值停止閃爍。

◆功能參數列表：

代號	功能說明設定	參數值	
		出廠預設	範圍
F05	上下限警告設定值	17	0-99℃
F06	除濕時間	5	0-10分
F07	P 比例帶	50	0-250℃
F08	I 積分時間	120	0-3999秒
F09	D 微分時間	30	0-3999秒
F10	溫度微調	0	0-50℃
F11	手動模式可設定最大上限	100	0-100%
F12	相位輸出模式設定OFF時為零位輸出,設定ON時為相位輸出	OFF	ON/OFF
F13	感溫線種類別	J	K/J
F18	Fuzzy Tuning 開關　0: 啟動　1:關閉	0	0-1
F19	單位切換　0：℃　1：℉	0	0-1

Module Description

1.	Process variable display
2.	Setting value display
3.	Indicators: OUT→ Heating output action ALM→ Temperature alarm output action SOFT→ CompusStep soft start for heater bake out if the process value is below 130℃ MANUAL→ Manual Mode AT→ PID Auto-Tuning action
4.	Increase or up key
5.	Decrease or down key
6.	Register key
7.	Display mode key: display output percent "P" or heater current "A"
8.	Auto/ Manual mode selector
9.	Power switch



CAUTION

Never insert or remove a controller from a mainframe with the AC power on. Hazardous potentials exist on components inside the mainframe and controller. Always disconnect AC power to the mainframe when servicing! Because these temperature controllers or associated equipment may not always fail safe, an approved temperature and or pressure safety control should be used for safe operation.

General description

The series zone temperature controller is a PID controlled instrument specifically designed for runnerless (hot runner) plastic injection molding applications. The controller is self-adjusting and capable of maintaining a very high degree of temperature accuracy over a wide rage of operating conditions. Simplified controls and the use of status indicators allow the operator to make adjustments easily. The status display also provides visual indication of normal or abnormal operating conditions existing in both the controller and or load.

Installation

To install the controller in a mainframe, release the locking device on the lower edge of the unit by pulling the plunger gently away from the panel. Align the upper and the lower edges of the controller printed circuit board with the respective card guides on the mainframe and slide the unit all the way into the mainframe until the rear connector is completely engaged. Lock the controller into the frame by depressing the plunger on the locking device.

Safety warning

In addition to presenting a potential fire hazard, high voltage and high temperature can damage equipment and cause severe injury or death.
When installing or using this instrument, follow all instructions carefully and use approved safety controls (high limit, etc.) Only suitably trained personnel should perform electrical wiring of connections.
Do not locate this instrument electrical where it may be subjected to excessive shock, vibration, dirt, moisture, oil, or other liquids.
Safe operating temperature range is 32 to 131°F (0 to 55°C).

Introduction

Thank you for choosing this control. Congratulations on your purchase. Used properly, this precision instrument will provide you with many years of trouble-free and productive service.
The series zone controllers offer many advanced features designed to increase productivity and ensure fast, accurate and repeatable mold temperature control.
→Compatible with all G units and all existing hot runner controls for easy retrofit/ replacement.
** G is registered Trademark of the DME CO.
→Simultaneous display of both process/ set point temperature and process temperature / percent power output or heater current.
→Auto tuning independently adjusts zone control characteristics.
→Built-in diagnostics alert operator to fault conditions.
→AdjCompStep circuitry (F12) provides for safe heater warm-up through gradual phase-angle fired voltage control (soft start) or zero-crossing control (less interference).

Product description

The zone is a microcontroller-based "hot runner" family control module that provides temperature control and operator interface function. It controls one temperature zone by sensing a J or K thermocouple.
The zone operator input is via 1 5-button keypad. The controller has two displays comprised of seven-segment LED's. The upper display is a three-character display and the lower display is a four-character display. Additionally the unit has 5 discrete LED indicators to indicate system status.

The controller consist of two electronics boards (microcontroller and display), a triac / heat sink assembly, and a front panel assembly. It is physically and electrically compatible with the existing other brands mainframe system.
The zone is intended for use in an industrial environment by both technical and non-technical personnel. With this in mind, the controller hardware and software are designed for straightforward use with a high level of fault tolerance.

●Entering and changing parameter values

The PID parameters exist in function menu. Enter the menu by holding down the SET key for one second the main menu will appear and still hold on SET key then press the MODE key will entry sub menu (F05~F13);
1). F07: Proportional Band
2). F08: Integral time
3). F09: Derivate time
→To adjust parameters use the up or down keys.
→To select next item in menu press the SET key.

●Proportional bandwidth

This item is accessible within the menu. This PID control parameter is adjustable from 0 to 482°F/ 250°C

●Rate

This item is accessible within the menu. This PID control parameter is adjustable from 0 to 3999 sec.

●Auto tune

When F03 is ON.

●Mode of operation

1. Manual mode
To switch to manual mode from auto mode, press the Auto/Manual key until the MAN LED illuminates. This mode allows the operator to adjust the manual output percentage (0 to 100%) by pressing the UP/ DOWN arrow keys.
There are two different parameters this can be viewed on the lower display while in manual mode. Pressing the display key will toggle between them.
1. Manual control output percent: display followed by "P"(modifiable by user)
2. Measured heater current (display followed by "A")

●2. Auto mode

To select auto mode, press the Auto/Manual key until the MAN LED turns off. This mode allows the operator to adjust the Set point temperature value by pressing the UP/ DOWN arrow keys.

There are three different parameters that can be viewed on the lower display while in auto mode. Pressing the MODE key will toggle between them.

1. Set point value (modifiable by user)
2. Output percent (display followed by "P")
3. Measured heater current (display followed by "A")

Functions

The controller provides the following functions:

●Sensor sampling

A "J" or "K" (optional) thermocouple is sampled using a 16-bit dual-slope integrating A/D converter. Input voltages corresponding to temperatures from 32 to 827°F (0 to 470°C) are processed with a resolution of 1°C.

●Closed loop control

A PID control algorithm is used to adjust the amount of power delivered to the load. The proportional band and derivative parameters are individually and directly adjustable. The integral parameter tracks the derivative parameter by a fixed ratio.

●Open loop control

In open loop (manual control mode), the operator is able to set the output percentage.

●Adjcompstep (heater bake-out)

Drying heaters on startup provides graduated phase-angle activation of the TRIAC.

●Temperature indication

Actual process temperature is indicated on the process display (upper display). Unit °C for this display are displayed on the lower display.

●Heat on indication

An OUT LED is lit whenever the output is on. For additional output state information, the operator will also be given the ability to directly monitor the heater output percentage from the front panel's lower display. (see page 9.)

Current monitoring

The controller is capable of monitoring and displaying the average current being delivered to the load by pressing MODE key. The display is in 0.1 amperage increments.

Manual control mode

Auto/ manual has easy accessibility from the front panel. Pressing the "Auto/Manual" key until the LED adjacent to "MAN" legend is illuminated will cause manual control to begin. Manual control is also activated at zero percent when input error conditions (thermocouple disconnected) arise and under these circumstances is activated automatically regardless of the "Auto/Manual" key Enable state. The initial control percent, established when manual control is activated, is dependent upon the cause of activation. When entered normally because of operator actions, a bump less transfer is attempted. Pressing the "Auto/Manual" key again (when in manual mode) returns the control to automatic mode.

Adjcompstep/ bake out/ soft start

Gradually applying power to the heaters extends the life of the heaters and the mold. Phase angle firing is used to implement the Adjcompstep feature. The adjcompstep will last for 5 minutes or until the temperature reaches 200°F/93°C. Adjcompstep is a self-terminating feature but the operator may also terminate it by pressing the mode key.

Auto tune (AT)

The tune operation will follow adjcompstep. The tuner looks for stability in the process temperature before it proceeds. If system stability cannot be achieved within a fixed time period then the tune process will terminate. The operator has the ability to terminate Auto tuner execution by pressing the MODE key while the auto tuner is active. During auto tuning, the AT LED lit and the process value flashes.

Normal control mode (Auto)

The control algorithm used for normal control mode is PID. The rate and proportional band parameters appear in the menu system. The reset parameter is always set to a value equal to five times the rate. The controller has a fixed cycle time of 50ms (20Hz).

Bump less transfer

The controller employs an intelligent bump less transfer. When the process is within five degrees of set point, the controller periodically records the output percent necessary to maintain set point. When an operator initiated transition to manual control occurs, the recorded output percentage is used.

Current monitor/ output failure detection

The current monitor processor continually monitors heater current readings to insure that they correlate with output activity.
If the output device signal (heat) is off and a current flow is detected that means triac short error occurs, all other indicators are set off, and all control processing will terminate.
If the output device is on but no current flow is detected the processor will post a bad heater error, the lower display will toggle E-2, all other indicators are set off, and all control processing will terminate.
If either of these error conditions is detected, the optional power interrupt relay provided by the hardware will open to interrupt power between the TRIAC and the heater.
There is no automatic recovery from either of these problems. Once detected and posted, power to the unit must be cycled for control processing to resume.

Sensor error detection

When a sensor error is detected, the upper screen will display E-6 if the thermocouple is reversed, E-1 if the thermocouple is open. The output will turn off.

Normal operating mode

The following summarizes key functionality within normal operating mode:
SET: Press and hold on SET key for one-second main menu system entry will occur.
Up-arrow: This key will increment the current value of the item presented is one that can be incremented. The measured heater current value is an example of a lower display item, which cannot be incremented.
Down-arrow: This key will decrement the current value of the item presented on the lower display when the item presented is one that can be decremented.
MODE: This key is for heater current or output percentage display.
AUTO/MAMUAL: AUTO/ MANUAL mode selection.

Normal operating mode display functions

In the absence of any special circumstances or error conditions, the upper display (3-character display) of the Controller is dedicated to the presentation of the process value when the unit is in normal operating mode. The process value is displayed in unit ℃.
In the absence of any error conditions, the lower display (4 character display) of the controller is used to present a variety of items. The operator can index through the available items with brief presses of the MODE key.

Auto tune active indicator

Whenever the auto tune process is active, the process value will start blinking on the upper display.

The auto tune process can terminate itself for two reasons. Self-termination occurs because the process has either completed or an error has been detected. When the process has completed, the AT LED will go off and the display reverts to a steady display of the process value.

Pressing the MODE key while the auto tune process is active can also terminate the auto tune process. The unit will go directly to normal control mode, the display reverts to a steady display of the process value.

Function Parameter Table

Code	Description	Default	Range
F01	Soft start mode	OFF	ON/OFF
F02	Manual output	OFF	ON/OFF
F03	Auto tuning	OFF	ON/OFF
F04	Data locking mode	OFF	ON/OFF
F05	Alarm temperature range	17	0-99℃
F06	Soft start duration	5	0-10min
F07	PID proportional band	50	0-250℃
F08	PID integral time	120	0-3999sec
F09	PID derivate time	30	0-3999sec
F10	Temperature offset	0	0-50℃
F11	Max for manual output percentage.	100	0-100%
F12	Phase angle firing/ Zero crossing output control.	OFF	ON/OFF
F13	Sensor type	J	K/J
F18	Fuzzy tuning switch 0: Start 1: Off	0	0-1
F19	Temperature unit selection 0: ℃ 1: ℉	0	0-1

Specifications

Operating temperature:	32 to 131°F (0 to 55°C)
Shipping temperature:	-40 to 158°F (-40 to 70°C)
Humidity:	10 to 95% non-condensing
Sensor type:	J or K thermocouple
Sensor range:	32 to 827°F (0 to 470°C)
Sampling rate:	20Hz (50ms)
Noise rejection:	common mode> 100dB;
	series mode> 70 dB
Temperature accuracy:	±0.3% of span
Displays:	7-segment LEDs; 3-digit upper (red) and 4-digit lower (green)
Upper display height:	14.2mm/ 0.56″
Lower display height:	9.15mm/ 0.36″
Output status indicator:	Orange LED
Alarm status indicator:	Red LED
Soft start mode indicator:	Yellow LED
Manual mode indicator:	Green LED
AT mode indicator:	Dark blue LED
Control output device type:	Triac, 15A at 120/ 240 Vac; Optional 30A.
Operator Activation/ interface:	4 momentary switches, 16A power switch.
Power requirements:	85 to 250V 50/ 60 Hz nominal.

All specifications are subject to change without notice.

Warranty

One-year limited warranty

This equipment is warranted to be free from defects of material and workmanship, it is sold subject to our mutual agreement that the liability of manufacturer, incorporated is to replace or repair this equipment at its factory, provided that it is returned with transportation prepaid within one year of its purchase.

The purchaser agrees that manufacture, incorporated assumed no liability under any circumstances for consequential damages resulting from use or from improper handling or packaging of shipments returned to the factory.

Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, electromechanical relays, and triacs, units, which have been modified by a customer in any way, are not warranted.
Other than those expressly stated herein, there are no other warranties of any kind, express or implied, and specifically excluded but not by way of limitation, are the implied warranties of fitness for a particular purpose and merchantability.
It is understood and agreed the seller's liability whether in contract, in tort, under any warranty, in negligence or otherwise shall not exceed the return of the amount of the purchase price paid by the purchaser and under no circumstances shall seller be liable for special, indirect, incidental or consequential damages. The price stated for the equipment is a consideration in limiting seller's liability. Purchaser may bring arising out of the transactions of this agreement no action, regardless of form, more than one year after the cause of action has accrued.
Seller's maximum liability shall not exceed and buyer's remedy is limited to either (i) repair or replacement of the defective part or product, or at seller's option (ii) return of the product and refund of the purchase price, and such remedy shall be buyer's entire and exclusive remedy. The specifications put forth in this manual are subject to change without notice.

●Error code display

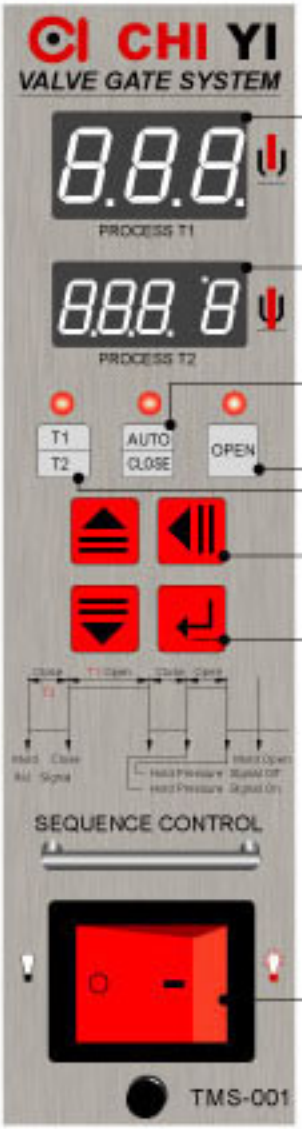
Error code	Description
E-1	Open thermocouple
E-2	Open heater
E-3	When process temperature exceed the alarm temperature range
E-4	When process temperature exceed 450℃, the module will shut down automatically.
E-5	AT failure
E-6	Reverse thermocouple

MPR型溫控器插座，插座配線圖

溫控器點數 ZONE(STD.)	插座型式 CONNECTORS	控制點序號 CONTROL NO.							
單點 SINGLE	5P X 1 SET (電熱, 感溫共用) (Heater with T/C)	區點編號 ZONE NO.		NO.1					
		電熱電源 Heater source		1,2					
		感溫 T/C	(+)	3					
			(−)	4					
4點 4 ZONES 1點 ~ 4點 1 ~ 4zones	16P X 1 SET (電熱, 感溫共用) (Heater with T/C)	區點編號 ZONE NO.		NO.1	NO.2	NO.3	NO.4		
		電熱電源 Heater source		1,2	3,4	5,6	7,8		
		感溫 T/C	(+)	9	11	13	15		
			(−)	10	12	14	16		
8點 8 ZONES 5點 ~ 8點 5 ~ 8 zones	16P X 2 SETS (電熱, 感溫共用) (Heater with T/C)	區點編號 ZONE NO.		NO.5	NO.6	NO.7	NO.8		
		電熱電源 Heater source		1,2	3,4	5,6	7,8		
		感溫 T/C	(+)	9	11	13	15		
			(−)	10	12	14	16		
6點 6 ZONES 1點 ~ 6點 1 ~ 6 zones	24P X 1 SET (電熱, 感溫共用) (Heater with T/C)	區點編號 ZONE NO.		NO.1	NO.2	NO.3	NO.4	NO.5	NO.6
		電熱電源 Heater source		1,2	3,4	5,6	7,8	9,10	11,12
		感溫 T/C	(+)	13	15	17	19	21	23
			(−)	14	16	18	20	22	24
12點 12 ZONES 7點 ~ 12點 7 ~ 12 zones	24P X 2 SETS (電熱, 感溫共用) (Heater with T/C)	區點編號 ZONE NO.		NO.7	NO.8	NO.9	NO.10	NO.11	NO.12
		電熱電源 Heater source		1,2	3,4	5,6	7,8	9,10	11,12
		感溫 T/C	(+)	13	15	17	19	21	23
			(−)	14	16	18	20	22	24

溫控器點數ZONE(US TYPE)	插座型式 CONNECTORS	控制點序號 CONTROL NO.							
美規單點 SINGLE	5P X 1 SET (電熱, 感溫共用) (Heater with T/C)	區點編號 ZONE NO.		NO.1					
		電熱電源 Heater source		1,4					
		感溫 T/C	(+)	2					
			(−)	3					
美規5點 5 ZONES 1點 ~ 5點 1 ~ 5 zones	電熱 25P X 1 SET Heater 感溫 10P X 1 SET T/C	區點編號 ZONE NO.		NO.1	NO.2	NO.3	NO.4	NO.5	
		電熱電源 Heater source		A1,A2	A3,A4	A5,A6	A7,A8	B2,B3	
		感溫 T/C	(+)	1	2	3	4	5	
			(−)	6	7	8	9	10	
美規8點 8 ZONES 1點 ~ 8點 1 ~ 8 zones	電熱 25P X 1 SET Heater 感溫 16P X 1 SET T/C	區點編號 ZONE NO.		NO.1	NO.2	NO.3	NO.4	NO.5	NO.6
		電熱電源 Heater source		A1,A2	A3,A4	A5,A6	A7,A8	B2,B3	B4,B5
		感溫 T/C	(+)	1	2	3	4	5	6
			(−)	9	10	11	12	13	14
		區點編號 ZONE NO.		NO.7	NO.8				
		電熱電源 Heater source		B6,B7	C1,C2				
		感溫 T/C	(+)	7	8				
			(−)	15	16				
美規12點 12 ZONES 1點 ~ 12點 1 ~ 12 zones	電熱 25P X 1 SET Heater 感溫 24P X 1 SET T/C	區點編號 ZONE NO.		NO.1	NO.2	NO.3	NO.4	NO.5	NO.6
		電熱電源 Heater source		A1,A2	A3,A4	A5,A6	A7,A8	B2,B3	B4,B5
		感溫 T/C	(+)	1	2	3	4	5	6
			(−)	13	14	15	16	17	18
		區點編號 ZONE NO.		NO.7	NO.8	NO.9	NO.10	NO.11	NO.12
		電熱電源 Heater source		B6,B7	C1,C2	C3,C4	C5,C6	C7,C8	A9,C9
		感溫 T/C	(+)	7	8	9	10	11	12
			(−)	19	20	21	22	23	24

TMS型時序控制器



澆口開啟時間顯示視窗
GATE OPENING TIME
DISPLAY WINDOW

澆口延遲開啟時間顯示視窗
GATE OPENING DELAY TIME
DISPLAY WINDOW

自動模式鍵
AUTO MODE KEY

手動強制澆口開啟鍵
MANUAL MODE KEY

T1，T2設定選擇鍵
T1, T2 SET UP KEY

時間設定游標調整鍵
TIME VALUE SHIFT KEY

確認鍵
ENTER

電源開關
POWER SWITCH

TM時序控制器	可控制點數
TM-001	1點
TM-002	2點
TM-003	3點

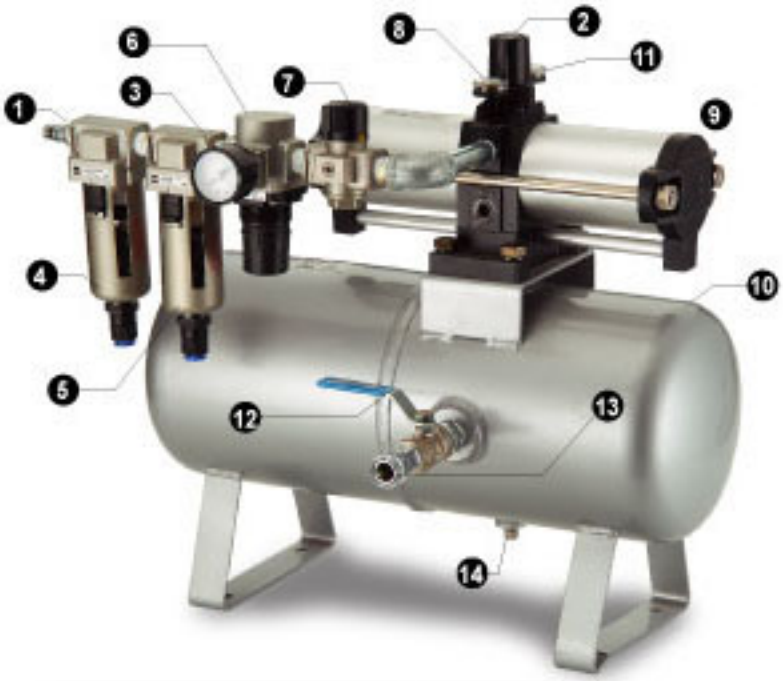
操作說明

1.外接電源：確認接妥220V單相2線式電源電纜或380V接線方式，一線接中性線，一線接380V。
2.接妥訊號線：將微動開關，固定於模具上之固定側。
3.以氣壓管連接控制器，上方提把右側進退針氣口，與模具上之氣壓閥進退針氣口，並注意進針、退針之方向性，若接上後進退針方向為反向則請改正。(接上氣壓後閥針於模具上需為閉合)
4.將空壓機出氣管，以快速接頭連結於時序控制器，左側之進氣口。
5.檢查上述步驟，確認無誤則可將右側大按鈕依箭頭方向，旋轉即可，旋轉後，上方電源指示燈亮起，則代表主電源已被開啟。若按壓紅色大按鈕則是將主電源關閉。
6.打開面板下方電源開關，以T1、T2鍵設定，澆口開啟時間，及澆口開啟延遲時間，以T1設定所需之射出時間(必須以T2+射出+保壓+鬆退)，T2設定模具合閉後，所需延遲之射出時間。
7.若需觀察閥針是否動作，可OPEN按鍵強制開啟，欲關閉則以按鍵CLOSE復歸，並回到Auto。

OPERATION:

1. Input power connection: Make sure 220v single phase 2 wires or 380v power cable is connect correctly, one wire is connect to neutral another is connect to 380v
2. Single cable connection: Install the limit switch in the fixed side of the mould.
3. Connecting air hoses of controller to valve gate cylinder.
4. Connecting an air hose between o/p air quick coupler and controller's i/p air connector.
5. Check last few steps, make sure the proper procedure is followed, then turn the reset button clockwise the power indicator will turn on, it means the main power is provided, the power is off when the reset button is pressed.
6. Turn on the switch, set up gate opening and delay time:
   T1 is for injection delay time
   T2 is for injection time
7. Manual control mode: The gate can open or close by pressing open or close key.
   Press AUTO/CLOSE key again will back to auto mode.

AP型氣壓增壓缸



氣壓增壓缸	儲氣量 accumulation capacity
AP-0505	5ℓ
AP-1010	10ℓ
AP-2020	20ℓ

1. 入風口 (快速公接頭6.5×10)：AIR SOURCE CONNECTOR (MALE QUICK COUPLER 6.5×10)
2. 入風口一次調節器：FIRST AIR SOURCE CONTROLLER
3. 入風口一次壓力表：FIRST AIR SOURCE PRESSURE METER
4. 過濾器：AIR FILTER
5. 潤滑油：LUBRICANT
6. 入風口開關：INPUT AIR VALVE
7. 入風口二次調節器：SECOND AIR SOURCE CONTROLLER
8. 入風口二次壓力表：SECOND AIR SOURCE PRESSURE METER
9. 增壓缸：BOOSTER
10. 儲壓缸：AIR TANK
11. 出風口壓力表：OUTPUT AIR PRESSURE METER
12. 出風口開關：OUTPUT AIR CLOSER
13. 出風口 (快速母接頭6.5×10) ：OUTPUT AIR CONNECTOR (FEMALE QUICK COUPLER 6.5×10)
14. 洩壓閥：RELIF VALVE

1.入風口：連接工廠空壓機，供給增壓缸空氣來源。
2.入風口一次調節器：可調整空壓機入風壓力，以利出風口壓力變化。
3.入風口一次壓力錶：查看一次調節器，調整後壓力大小數值。
4.濾水器：過濾空壓機來源端水份，以保護防止增壓缸生鏽、鏽死。
5.潤滑油：潤滑增壓缸，使其動作更加順暢。
6.入風口開關：阻隔入風來源，增壓缸便無法動作。
7.入風口二次調節器：增壓缸入風口風壓二次調整。
8.入風口二次壓力錶：再確認增壓缸入口壓力，有助出風口壓力精準度。
9.增壓缸：將入風口來源壓力自動提升二倍的風壓。
10.儲壓缸：把增壓缸升壓後的氣體儲存於桶內，使其保持風壓之穩定性。
11.出風口壓力錶：監看出風口壓力，確定供給壓力與需求壓力一致。
12.出風口開關：控制出風口的送風與否。
13.出風口：直接接於設備使用端，供給設備高壓風力。
14.洩壓閥：洩放儲壓缸內風壓，增壓缸設備不使用時洩放儲壓缸內氣體，可延長增壓缸之使用壽命。

1. AIR SOURCE CONNECTOR: Connecting to air supply source such as air compressor and so on.
2. FIRST AIR SOURCE CONTROLLER: The device will control input air pressure for high or low output air pressure value.
3. FIRST AIR SOURCE PRESSURE METER: To read the current air pressure value.
4. AIR FILTER: The device will filter out most moisture from air source to protect booster from rusty or jam.
5. LUBRICANT: The lubricant will make smooth movement inside the booster.
6. INPUT AIR VALVE: Stopping the input air flow to disable the booster
7. SECOND AIR SOURCE CONTROLLER: The device will control the input air pressure into booster.
8. SECOND AIR SOURCE PRESSURE METER: To read the current air pressure value.
9. BOOSTER: To make the input air pressure value double.
10. AIR TANK: Air accumulator.
11. OUTPUT AIR PRESSURE METER: To read the current output air pressure value.
12. OUTPUT AIR CLOSER: To provide output air.
13. OUTPUT AIR CONNECTOR: Connecting to the equipment, which needs high air pressure source.
14. RELIF VALVE: The device will release the residual air inside the tank to prolong the usage of the booster.

溫控器至模具上電熱感溫纜線及插座盒規格
Temperature controller accessories

1

D：CBA-5

2

D：CBC-1606　　D：CBC-2406

訂購温控器時，需注意、註明：
1.使用地區之電力系統，電壓相數及線數。
2.控點數及每區電熱容量。
3.感温線型式（J型或K型），標準規格：J型。
4.輸出纜線長度。
5.插座及插座盒規格。
6.選用配備。

Please specify the following questions when order temperature controller
1. What power source you provide:
2. How many control zones are needed? Specify the power and amperage for each zone.
3. Thermocouple type: J or K? Standard stock is J type.
4. Specify cables length and connectors.
5. Connectors and housings
6. Choose optional accessories:

模具梯型固定座規格 / *Set dimensions for connectors (on mold side)*　　單位：*mm*

項目 NO.	產品型號 PRODUCT CODE	適用插座 CONNECTION	插座編號 CONNECTOR CODE	固定座 SET	固定座編號 SET PRODUCT CODE	長 LENGTH	寬 WIDTH	高 HEIGHT	固定螺孔距 PITCH BETWEEN SCREW HOLES	
1	D:CBA-5	5 PIN側掛勾公接線盒	CN-5ANI	5 PIN固定底座	CB1-5	69	35	25	57（M6×2孔）	
2	D:CBC-1606	16 PIN有蓋公接線盒	CN-16BNI	16 -24PIN集線盒	CB-16240106	164	61	61	X:38.5	Y:153
	D:CBC-2406	24 PIN有蓋公接線盒	CN-24BNI	16 -24PIN集線盒	CB-16240106	164	61	61	X:38.5	Y:153

3

D：CBC-1610　　D：CBC-2410

4

D：CBD-12

D：CBD-8

D：CBD-5

模具方型固定座規格 / *Set dimensions for connectors (on mold side)*　　單位：*mm*

項目 NO.	產品型號 PRODUCT CODE	適用插座 CONNECTION	插座編號 CONNECTOR CODE	固定座 SET	固定座編號 SET PRODUCT CODE	長 LENGTH	寬 WIDTH	高 HEIGHT	固定螺孔距 PITCH BETWEEN SCREW HOLES X	Y
3	D：CBC-1610	16PIN有蓋公接線盒	CN-16BNI	16-24PIN集線盒	CB-16240110	164	61	104	38.5	153
	D：CBC-2410	24PIN有蓋公接線盒	CN-24BNI	16-24PIN集線盒	CB-16240110	164	61	104	38.5	153
4	D：CBD-5	10PIN側掛勾公接線盒 25PIN側掛勾公接線盒	CN-10ANI CN-25ANI	10-25PIN集線盒	CB-102502	220	61	104	38.5	208
	D：CBD-8	16PIN側掛勾公接線盒 25PIN側掛勾公接線盒	CN-16ANI CN-25ANI	16-25PIN集線盒	CB-162502	240	61	104	38.5	228
	D：CBD-12	24PIN側掛勾公接線盒 25PIN側掛勾公接線盒	CN-24ANI CN-25ANI	24-25PIN集線盒	CB-242502	267	61	104	38.5	255

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