

# PAN-GLOBE

E-系列  
E-Series

SCR 電力控制器  
SCR POWER CONTROLLER

# 說明書

## INSTRUCTION



# 前言

閘流體電力控制器 (SCR POWER CONTROLLER) , 目前在工業中已被廣泛應用於各種電力設備中, 諸如窑爐、熱處理爐、電氣高溫爐、高周波機械、電鍍設備、印染設備、塗裝設備、射出機、押出機等等, 然而因為負載的不同, 使用環境的限制, 而又有各種不同的控制模式及各種追加配備, 如相位控制 (Phase Angle Control) , 分配式零位控制 (Distributed Zero Crossover) , 時間比例可調試零位控制 (Time Proportional Zero Crossover) 。基於此, 本公司研製了P/E系列各種不同控制模式之電力控制器, 以滿足各用戶的需要。

P/E系列SCR電力控制器, 完全採用SCR POWER MODULE密封的IC化電路板, 使整個控制器簡單輕便, 以提高控制器的可靠度, 當要使用本控制器時, 請詳讀本說明, 以了解各種控制器的結構、功能、接線方法。

謝謝!

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## 一、產品特點 Product features

- (1) 全系列加裝高速保險絲，防止短路電流 ( $di/dt$ ) 對SCR造成損害。

The SCR unit attached with high speed fuse in order to prevent the damage of SCR due to the shortage current ( $di/dt$ )

- (2) 全系列開模成型，體積小，安裝配線容易。

The unit is packaged construction with less dimension, easy for installation and wiring.

- (3) 多只LED燈顯示，遇到狀況立刻可判斷故障原因，迅速排除。

The causes of malfunction can be indicated by individual LED lamp, easy for trouble shooting.

- (4) 輸出特性呈線性，控溫精度高。

Less non-linearity output provides accurate control of temperature.

- (5) 高品質，高技術產品，絕無干擾現象。

High quality and high technical productions with no electrical interference.

- (6) 性價比優。

Quality and cost is all good.

## 二、運行環境 Operation environment

- (1)  $-10\sim 50^{\circ}\text{C}$ , 90%RH以下，不結露。

Ambient temperature:  $-10\sim 50^{\circ}\text{C}$ , Relative humidity: Max 90%.

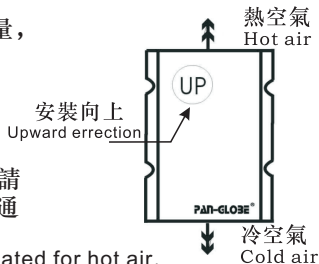
## 三、安裝 Installation

- (1) 電力調整器，內部均會產生熱量，

安裝時請依據安裝方向安裝。  
The SCR unit will produce heat itself during operation, please erect it upward according to the instruction

- (2) 控制箱須有空氣對流通風孔，請依熱空氣由下往上之原理裝置通風孔（或加裝抽風扇）

The panel must be upward ventilated for hot air.



we recommend mounting a ventilating.

(3)請勿安裝於高溫或通風不佳之場所，否則請低於實際之70%使用。

Do not install the unit in the space with high temperature and poor ventilating, Do not operate the unit exceed 70% of rated output in case of above mentioned poor ambient conditions.

## 四、負載測試 Load test

(1)負載未接或電流太小 (0.6A以下) SCR維持電流 ( $I_h$ ) 不足，無法正常導通，測試時請接0.6A以上之負載。

The SCR unit will not well functioned in case of less output load (0.6Amp). Please connect the load at least 0.6Amp.

## 五、控制方式及輸出波形

### Control mode and output wave

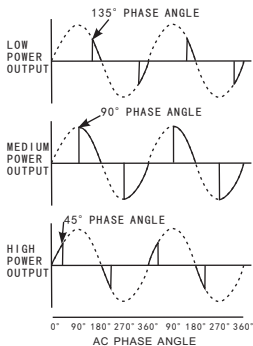


Fig 1 Phase Angle Power Control

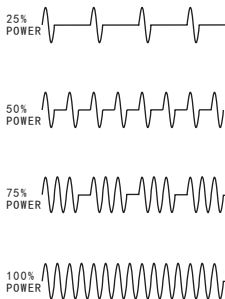


Fig 2 Distributed Zero Crossover Power Control

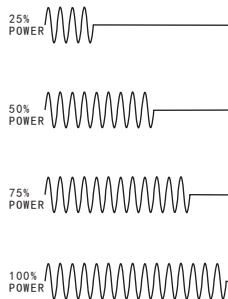


Fig 3 Time Proportioned Power Control

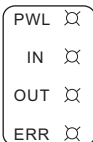
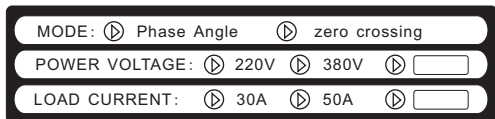
## 六、LED燈顯示狀況及故障排除

### LED lamp indication and trouble shooting

編號 Pos. NO	顏色 Color	顯示狀況 Indicating condition	異常故障原因 Causes of malfunction	處理對策 Treatment and trouble shooting
PWL (L1)	紅色 Red	電源指示燈不亮 No indication of power supply lamp (燈亮表示正常) Lamp lighting means normal	1、輔助電源未送電 No power of Aux.source. 2、PCB基板故障 Malfuntion on PCB board 3、SCR超溫 Over temperature of SCR	1、檢查輔助電源電路 Check the AUX.power supply. 2、更換PCB基板或送修 Repair or replace the PCB board 3、檢查SCR超溫情形 Check the SCR temperature.
IN (L2)	綠色 Green	輸入指示燈不亮 No indication of input lamp (燈亮表示正常) Lamp lighting means normal	1、TIC輸出信號未輸出 No output signal from TIC 2、TIC輸出信號極性反 Output signal from TIC is reverse. 3、內部MAX或外部VR歸零 Max value of internal output or External VR is zero setted.	1、檢查TIC輸出信號 Check the output signal of TIC 2、檢查TIC輸出信號接線 Reverse the connecting wiring of TIC. 3、檢查內部MAX及外部VR Check the setting of internal and external VR output
OUT (L3)	黃色 Yellow	輸出指示燈不亮 No indication of output lamp (相位-燈亮表示正常) Phase angle control lamp lighting means normal (零位-閃爍表示正常) Zero crossing control lamp blinks means normal	1、無TIC信號或反接 No output signal from TIC or reverse the connecting of output signal. 2、IN燈有亮,OUT燈不亮 Lamp IN lighting and lamp OUT no indication. 3、OUT燈亮,無電流輸出 Lamp OUT lighting but no current output . OUT no indication.	1、檢查IN燈,燈未亮表示TIC無輸出信號或反接 Check the lamp IN,NO indication means no output singnal from TIC or reverse wired. 2、PCB基板故障,更換或送修 Repair or replace the PCB board in case of the malfunction from the board. 3、檢查主電源或保險絲 Check main power supply or fuse
ERR (L4)	紅色 Red	SCR超溫指示燈燈亮 Over-temp of SCR lamp light (燈亮則表示異常) Lamp light means SCR over temp	1、SCR散熱風扇故障或卡住 Malfunctin or dirt blocking on the ventilation fan 2、周圍環境溫度過高或通風不良 High ambient temperature or poor ventilation.	1、更換風扇或清除異物 Replace or clean the dirt of the impeller. 2、改善通風條件 Improve the ventilation condition

# 七、使用說明 Operation instruction

## SINGLE PHASE 50/60HZ



### (一) 規格說明 Description and specification

(請依使用場合，訂購適用之電力調整器規格)

Please order the thyristor power regulator according to the following specifications.

- MODE: ● PHASE ANGLE(相位控制，適用定阻抗負載)  
(PHASE angle control mode, suitable for constant current load)
- ZERO CROSSING (零位控制，適用定阻抗負載)  
(Zero crossing control mode, suitable for constant current load)

### (二) 調整功能 Adjustable functions

- BLAS 基准電壓輸出量調整 (5mA)  
Output adjustment of basic voltage.(5mA)
- MAX 最高輸出量調整 (0~100%)  
Max output adjustment.(0~100%)

### (三) 輸入信號選擇 Selection of input signal

- 4~20mA, MANUAL 將J6短路片置於Jump J6 Setting At 4~20
- 1~5V, \*0~5Vdc 將J6短路片置於Jump J6 Setting At 1~5

### (四) 指示燈功能 Description of indicating lamp

- PWL(PL紅色) 電源指示 (輔助電源通電時亮)  
Indication of power supply(light when Aux.Power switched on)

IN(IN綠色)

溫度表信號指示隨信號量大小明滅)

Indication of transfer signal from TIC (Lamp illuminating acc. TO the output signal of TIC)

OUT(OUT黃色)

輸出中指示 (隨輸出量大小明滅)

Output signal transferring(lamp illuminating acc.To the output)

ERR(ERR紅色)

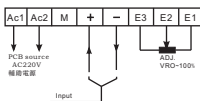
故障指示 (SCR超溫指示)

Malfunction indication(lamp lighting in case of SCR over temp)

## 八、接線範例 Examples of connecting circuit

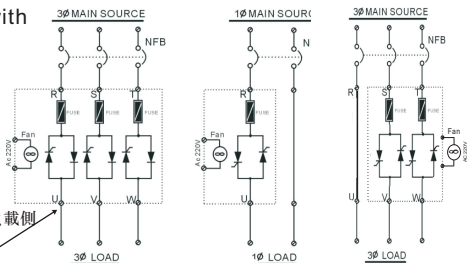
(1) 電壓，電流信號輸入，輸出百分比可調。

Voltage, current signal with adjustable External VR.



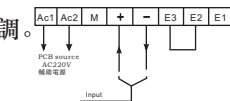
如須加裝電磁開關時請置於負載側  
The magnetic switch must be installed load output

主回路接線圖  
Main Circuit



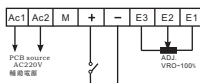
(2) 電壓，電流信號輸入，輸出百分比不可調。

Voltage, current signal with none VR.



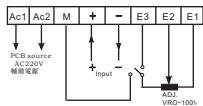
(3) 接點控制信號輸入，輸出百分比可調。

Contact control signal with adjustable External VR.

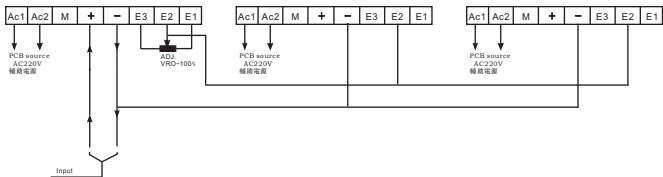




- (4) 自動手動切換控制，輸出百分比可調。  
Contact control signal with adjustable External VR.

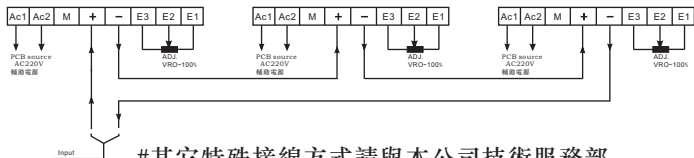


- (5) 多台連接，一台外部VR設定。  
Multiple unit connecting with 1set external VR setting



- (6) 多台連接，各自分別外部VR設定，本串聯接法最多只限三台。  
Multiple unit connecting with individual external VR setting, the connecting method is only suitable for less than 3 installations.

Jump J6 setting at 4~20      Jump J6 setting at 4~20      Jump J6 setting at 4~20



#其它特殊接線方式請與本公司技術服務部  
For the other special connecting, please  
contact with manufacturer