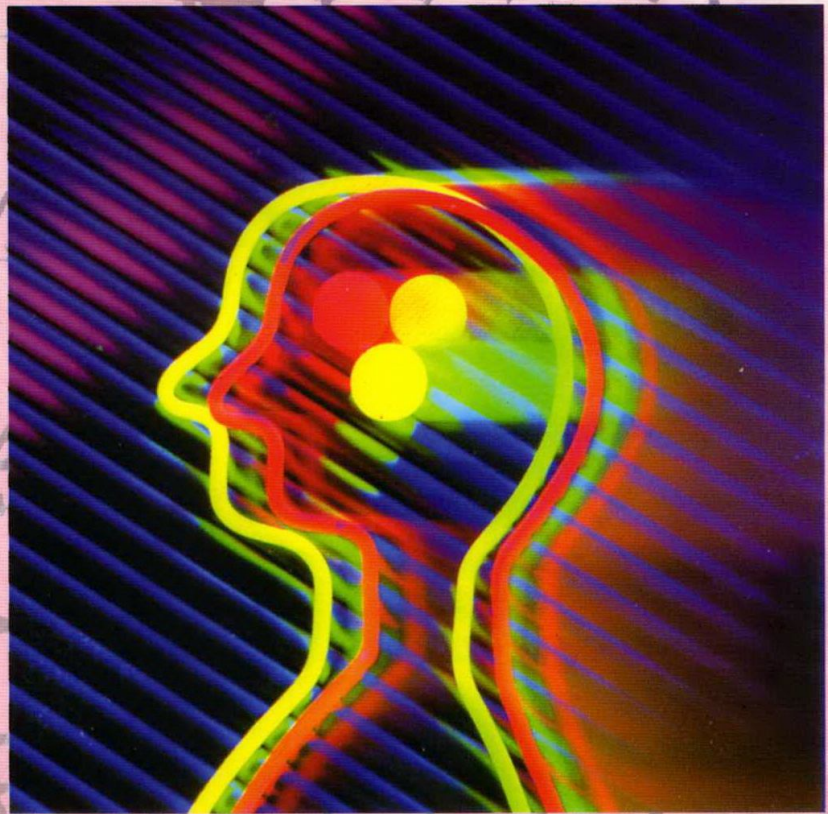


A 1-512
521-2

FOTEK

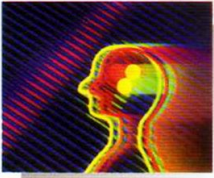
TEMPERATURE CONTROLLER



5.4,301
5.7(6.5)
38(51)
18(24)

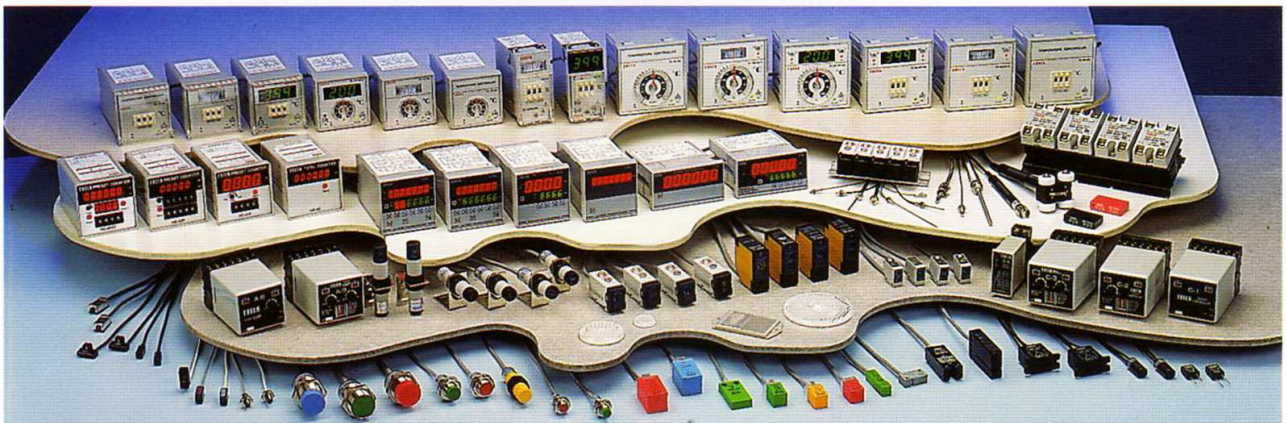
陽明電機股份有限公司

— 自動化控制器材專業製造廠 —



經營理念

- 追求永續經營
- 客戶是永遠的朋友
- 堅持品牌、追求至善
- 不斷研發生產物超所質的產品
- 責任、務實、創新、邁向未來



成立1985年

主要產品

- 計時器
- 轉速表
- 電壓表
- 光電開關
- 磁簧開關
- 溫度控制器
- 欠逆相保護器
- 計數器
- 線速表
- 電流表
- 近接開關
- 固態繼電器
- 液位控制器
- 馬達起動器

Established 1985

Main product

- Timer
- Tachometer
- Voltage Meter
- Photo Sensor
- Reed Sensor
- Temperature Controller
- Phase Relay
- Counter
- Line Speed Meter
- Current Meter
- Proximity Sensor
- Solid State Relay
- Floatless Level Relay
- Y- Δ Starter

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MT Series PID+Fuzzy Temperature Controller

FUZZY PID CONTROLLER

※ **Artificial Intelligence <AI> Control**

Fuzzy+PID Control

※ **Enhanced Autotuning Method**

AT BIAS VALUE SETTABLE

※ **Multi-Input Type**

K/J/PT SELECTABLE

※ **Alarm Function**

15 MODES SELECTABLE

※ **RUN/STOP Function**

OPERATED ON THE PANEL EASILY

※ **Communication Function**

RS-485 OPTIONED



■ Guiding of Model / 型號索引

EX. MT-4896-R-RS-mA

① ② ③ ④ ⑤

① **Series / 系列代號**

MT Series Temperature Controller

② **Outline / 外型尺寸**

4896=48<W>x96<H> mmxmm

48=48<W>x48<H> mmxmm

72=72<W>x72<H> mmxmm

96=96<W>x96<H> mmxmm

20=48(W)x 96(H) mmx mm

21=96(W)x 48(H) mmx mm

③ **Output Method / 輸出方式**

R=Relay Output

V=Voltage Pulse Output

L=Linear 4~20 mA Output

④ **Other / 其他**

Non=Standard

RS=RS-485

CT=Current Transmitter

S:PV Resender

⑤ **Input / 輸入**

Non=K/J/PT

mA=mA


V=0~10V

VR=Variable Resistance

■ Nomenclature / 圖示說明

PV:Display of The Process Value 顯示現在值

SV:Display of The Setting Value 顯示設定值

 :Key of Setting 設定鍵

 :Key of Shift & Function 功能鍵及移位鍵

 :Key of Increasing or Autotuning 上加鍵及自動演算鍵

 :Key of Decreasing & ON/OFF 下減鍵及開關鍵



■ General Specification & Characteristic / 共同規格及特性

Specification & characteristic		Data
Power supply	工作電壓	90 ~ 265 VAC 50/60 Hz
Power consumption	消耗電流	5VA max.
Sensor input	測溫體	K / J / PT-100Ω selectable
Control output	Relay	繼電器
	Voltage	電壓
	Linear	線性輸出
Alarm output	警報輸出	3A/ 250 VAC SPDT
Control method	控制方式	Fuzzy + PID or ON / OFF settable
Operating circumstance	工作環境	-20°C~+75°C ; 25% ~ 85% RH
Display accuracy	顯示精度	±0.1% of FS + 1 digit
Cycle time	動作週期	0 ~ 99 sec
Proportional band (P)	比例帶	0 ~ 999
integral time (I)	積分時間	0 ~ 3999
Derivative time (D)	微分時間	0 ~ 3999
Alarm range	警報範圍	-99 ~ 999
PV sampling time	取樣時間	0.1 sec
Input shift	輸入校正	-99 ~ +99
AT bias (TU)	自動演算偏差量	0 ~ 999
Memory method	記憶方式	EEPROM
Insulation resistance	絕緣阻抗	Over 50MΩ / 500VDC
Dielectric strength	耐壓強度	Over 2.5 kV / 1 minute
EMC standard		ESD : 8 KV Air Discharge (Level 3)/EN-61000-4-2 RF Interference: 10V/M/ENV50140 Bursttest:2KV/EN61000-4-4

■ Mode of alarm / 警報模式

ALT	Alarm description / 警報說明	ALT	Alarm description / 警報說明	ALT	Alarm description / 警報說明
0	AL1 ON SV (SV+AL1) AL2 ON SV (SV+AL2)	1	AL1 ON (SV-AL1) SV AL2 ON SV (SV+AL2)	2	AL1 ON (SV-AL1) SV AL2 ON (SV-AL2) SV
3	AL1 ON (SV-AL2) SV (SV+AL1) AL2 ON SV (SV+AL2)	4	AL1 ON (SV-AL1) SV (SV+AL1) AL2 ON SV (SV+AL2)	5	AL1 ON (SV-AL1) SV (SV+AL1) AL2 ON SV (SV+AL2)
6	AL1 ON (SV-AL2) SV (SV+AL1) AL2 ON SV (SV+AL2)	7	AL1 ON First cycle unable AL1 AL2 ON AL2	8	AL1 ON First cycle unable (SV-AL1) SV AL2 ON SV (SV+AL2)
9	AL1 ON First cycle unable (SV-AL1) SV (SV+AL1) AL2 ON SV (SV+AL2)	10	AL1 ON SV (SV+AL1) AL2 ON SV tnr 99h59m	11	AL1 ON AL1 AL2 ON AL2
12	AL1 ON AL1 AL2 ON AL2	13	AL1 ON SV (SV+AL1) AL2 ON (SV-AL2) SV	14	AL1 ON SV SV+AL1 AL2 ON (SV-AL2) SV
15	AL1 ON Flick ON SV (SV+AL1) AL2 ON SV (SV+AL2)	16	AL1 ON SV SV+AL1 AL2 ON SV tnr 99h59m	17	AL1 ON SV SV+AL1 AL2 ON SV tnr 99m59s
18	AL1 ON SV SV+AL1 AL2 ON SV tnr 99m59s	19	Non-use Note		











1 > 「ALT=15」: t = AL2 flick ON time settable, OFF time is controlled by PID
 2 > 「ALH」 is hysteresis of alarm
 Ex: PV ≥ (SV+AL1) → AL1 ON, PV < (SV+AL-ALH) → AL1 OFF
 3 > 「tnu」 = Process time of timer: 「tnu ≥ tnr」 → AL2 is turned ON or OFF

MT Series PID+Fuzzy Temperature Controller

Setting of Parameter / 參數設定

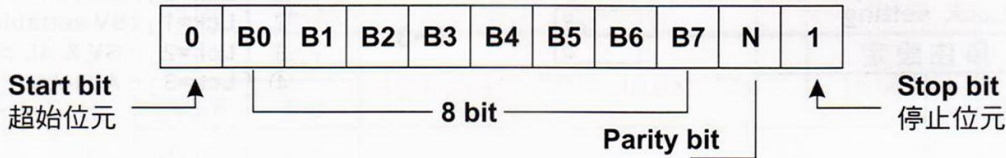
Function 參數設定	Symbol 參數符號	Range 範圍	Remarks 備註
Control status 控溫狀態 Press Key ↓ 3 sec	1999 1999	1>-999~9999	① CT=0 ON/OFF控制 CT=0 ON/OFF Control
Cycle Time 動作週期 Press Key ↓	CT 15	0~99	② 線性輸出型不顯示 Linear Type Disappeared
Auto Tunning 自動演算 Press Key ↓	AT 0	0 or 1	① AT=0 控溫狀態 AT=0 Control Status AT=1 自動演算狀態 AT=1 Autotunning Status
Autotunning Bias 演算偏差值 Press Key ↓	Tu 0	0~999	① 演算值 = SV-Tu Autotunning Value=SV-Tu
Proportional Band 比例帶 Press Key ↓	P 25	0~999	① CT=0 P值不顯示 CT=0 P Disappeared
Integral Time 積分時間 Press Key ↓	SEC I 150	0~3999	① CT=0 I值不顯示 CT=0 I Disappeared
Derivative Time 微分時間 Press Key ↓	SEC d 41	0~3999	① CT=0 D值不顯示 CT=0 D Disappeared
Hysteresis 應差設定 Press Key ↓	°C/°F HYS 2	-99~999	① CT=0 才顯示 CT=0 Appeared only
Input Selecting 輸入選擇 Press Key ↓	InE E	K/J/Pt	① K:0~1372°C ② J:0~1200°C ③ PT:-200~850°C
Unit Selecting 單位選擇 Press Key ↓	Unit °C	°C/°F	
Decimal Selecting 小數點選擇 Press Key ↓	dp 0	0 or 1	① dp=0 No Decimal Point ② dp=1 One decimal Point
Code 通信碼選擇 Press Key ↓	RS 0	0~2	① Communication type appeared only ② RS=0: BCD code (8N1) ③ RS=1: ASCII code (8N1) ④ RS=2: ASCII code (7O1)
BPS 傳輸速率 Press Key ↓	bPS 192	96 or 192	① 「96」:9600bps ② 「192」:19200bps
Input Shift 輸入校正 Press Key ↓	°C/°F ShE 0	-99~999	
Alarm Mode 警報模式 Press Key ↓	ALM 0	0~15	① 參考警報模式 Prefer to the mode of Alarm
Contoller No. 控制器編號 Press Key	Id 00	0~99	① 附RS-485才顯示 Communication Type Appeared Only

Setting of Alarm / 警報設定

Function 參數設定	Symbol 參數符號	Range 範圍	Remarks 備註
Control status 控溫狀態		-999~9999	
Press SET Key 3 sec			
Lock setting 鎖住設定		0~3	① 「Lck=0」:Unlock ② 「Lck=1」:SV settable only ③ 「Lck=2」:SV & AL settable only ④ 「Lck=3」:All lock
Press SET Key			
AL1 alarm setting AL1 警報值設定		-999~9999	
Press SET Key			
AL2 alarm setting AL2 警報值設定		-999~9999	① Refer to mode of alarm
Press SET Key			
Hysteresis of alarm 警報值應差設定		0~9999	Ex. Alarm mode=「0」 「PV>(SV+AL1)」→AL1 ON 「PV≤(SV+AL1-ALH)」→AL1 OFF
Press SET Key			
Heater break setting 加熱器斷線值設定		0.0~「CTH」	① 「CT」Type appeared only ② 「ctu」<「HB」→AL2 ON At heating status
Press SET Key			
Heating current 加熱器實際電流值			① 「CT」Type appeared only
Press SET Key			
Max. CT value 最大電流值設定		0.0~999.9	① 「CT」Type appeared only
Press SET Key			
Limit of setting 設定值上限設定		-999~9999	① SV ≤ 「Limit of setting」
Press SET Key			
Limit of output 最大輸出量設定		0~100%	① Ton ≤ 「Limit of output」 (Ton=Heating time)

Setting of Communication / 通信協定

Communication Standard	EIA RS-485	Communication Speed	「9600」 or 「19200」 bps
Bits	16 bits	Communication Station	0~99
Communication configuration	8N1 (RS=0 or 1) 7O1 (RS=2)	Communication Code	BCD (RS=0) ASCII (RS=1 or 2)



Process of Protocol

Read command:

@	ID	R	Address	FCS	CR
---	----	---	---------	-----	----

Response:

@	ID	R	Response code	Data	FCS	CR
---	----	---	---------------	------	-----	----

Write command:

@	ID	W	Address	FCS	CR
---	----	---	---------	-----	----

Response:

@	ID	W	Response code	FCS	CR
---	----	---	---------------	-----	----

Address:Parameter Address

位 址：參數位址

NO 號碼	Description 說明
00	AL1:Alarm # 1(Range:-99~999)
01	AL2:Alarm#2 (Range:-99~999)
02	Non-use
03	SLH:Limit of set (Range:0000~9999)
04	HYS:Hysteresis (Range:0000~9999)
05	Non-use
06	Non-use
07	CT Cycle Time (Range:00~99)
08	P:Proportion band (Range:0000~0999)
09	I:Integral time (Range:0000~3999)
10	D:Dervative time (Range:0000~3999)
11	INT:Input type(K:0000、J:0001、PT:0002)
12	UNT:Unit(°C:0000、°F:0001)
13	SHT:Input shift(Range:-99~0099)
14	ALT:Alarm mode (Range:0000~0015)
15	Non-use
16	Setting value (Range:-99~9999)
17	TU:Autotunning (Range:-99~0999)
18	ID:Station No (Range:0000~0099)
19	RV:Process Value (Range:-99~9999)
20	LCK:Setting lock (0000、0001、0002、0003)
21	AT:Setting of autotunning (AT OFF:0000、AT ON:0001)
22	Value of SV & PV
23	Status of OUT/AL1/AL2
24	Decimal point setting (Non:0000、One:0001)
25	ON/OFF setting (ON:0000、OFF:0001)

Remarks:

@:Start code / 起始碼

CR: Stop code / 停止碼

ID:Station number / 控制器編號

R:Read command / 讀取指令

W:Write command / 寫入指令

Address: Parameter address / 參數位址

Data: Data for reading or writing / 讀寫資料

FCS: Checking Sum / 查核碼

Response code: 回應碼

00:Command completed / 指令完成

01:Address error / 位址錯誤

02:Data error / 資料錯誤

03:FCS error / 查核碼錯誤

04:Command error / 指令錯誤

05:Lock / 未開放

PID+Fuzzy Temperature Controller MT Series

EX: To read the PV=31 of temperature controller (ID=0)

Read command:

@	ID	R	Address	FCS	CR
---	----	---	---------	-----	----

RS=1 or 2: @ 0 0 R 1 9 1A 0D 「FCS=40*30*30*52*31*39=1 A」

RS=0 :40 00 52 19 0B 0D 「FCS=40*00*52*19=0 B」

Read response:

@	ID	R	Response code	Data	FCS	CR
---	----	---	---------------	------	-----	----

RS=1 or 2: @ 0 0 R 00 00 31 0D

RS=0 :40 00 00 00 31 23 0D

EX: To write the SV=100 of temperature controller (ID=1)

Write command:

@	ID	W	Address	Data	FCS	CR
---	----	---	---------	------	-----	----

RS=1 or 2: @ 0 1 W 1 6 0 1 0 0 10 0D 「FCS=40*30*31*57*31*36*30*31*30*30=1 0」

RS=0 :40 01 57 16 01 00 01 0D 「FCS=40*01*57*16*01*00=0 1」

Write response:

@	ID	W	Response code	Address	Data	CR
---	----	---	---------------	---------	------	----

RS=1 or 2: @ 0 1 W 00 16 0D

RS=0 :40 01 57 00 16 0D

Note: [FCS=□□*□□*□□ ; 「*」 = 「XOR」]

Symbol	Description	ASCII Code	Symbol	Description	ASCII Code	Symbol	Description	ASCII Code
@	Start code	40	C	HEX	43	4	HEX/BCD	34
R	Read	52	D	HEX	44	5	HEX/BCD	35
W	Write	57	E	HEX	45	6	HEX/BCD	36
CR	Stop Code	0D	F	HEX	46	7	HEX/BCD	37
-	Minus	2D	1	HEX/BCD	31	8	HEX/BCD	38
A	Hex	41	2	HEX/BCD	32	9	HEX/BCD	39
B	Hex	42	3	HEX/BCD	33			

Status of OUT/ AL1/AL2 (Address=23)

Data	Out	AL1	AL2
00 00	OFF	OFF	OFF
00 01	ON	OFF	OFF
00 02	OFF	ON	OFF
00 03	ON	ON	OFF

Data	Out	AL1	AL2
00 04	OFF	OFF	ON
00 05	ON	OFF	ON
00 06	OFF	ON	ON
00 07	ON	ON	ON

MT Series PID+Fuzzy Temperature Controller

■ Illustration/功能說明

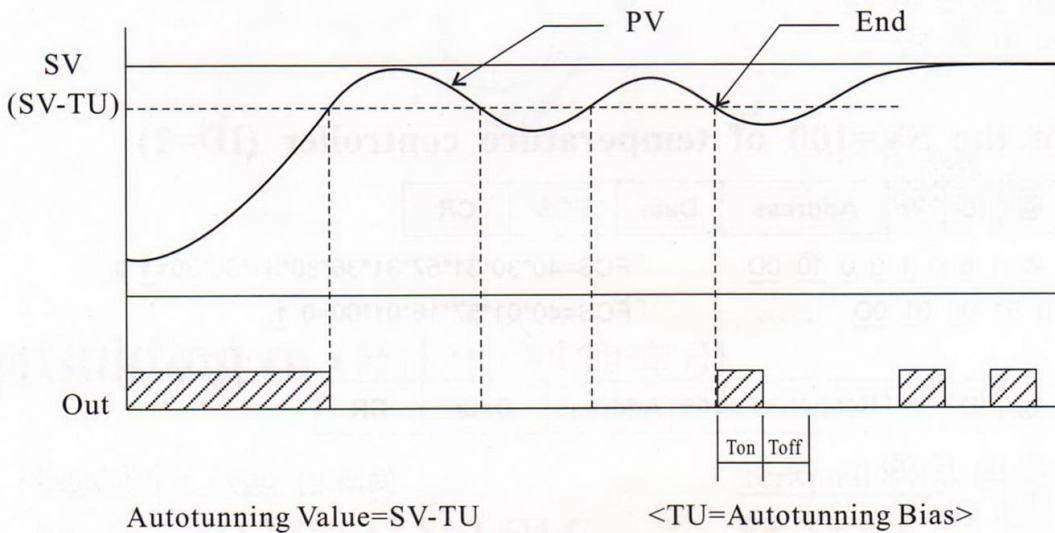
Cycle Time<CT>動作週期

CT=Ton+Toff

Ton=Time of Heater ON 加熱時間

Toff=Time of Heater OFF 不加熱時間

Auto Tunning<AT> 自動演算



Input Shift<SHT>輸出校正

To Correct The Difference Between The Actual Value And The PV Value
可修正實際值和顯示值的誤差

PV Resender 顯示值再傳送

The Range of Transmitter Is Set By The SLH.


Ex. SLH=200,0~200 Will be Transmitted To 4~20mA


"OFF" Key 關閉鍵

To Turn OFF All Output Of Temperature Controller,Only Display
The Value of PV.

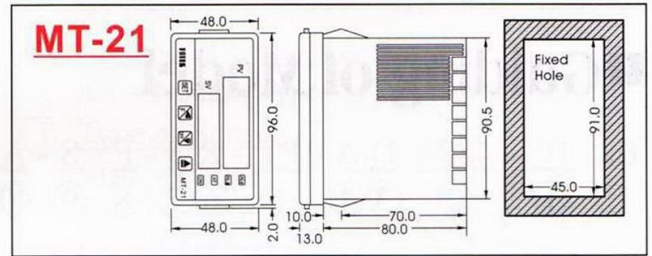
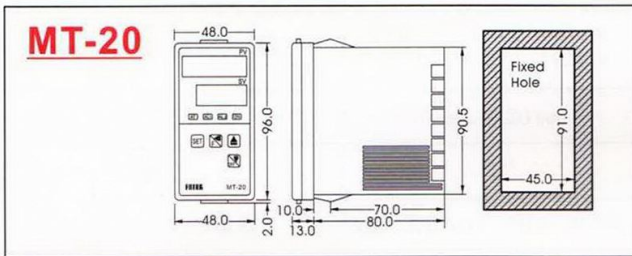
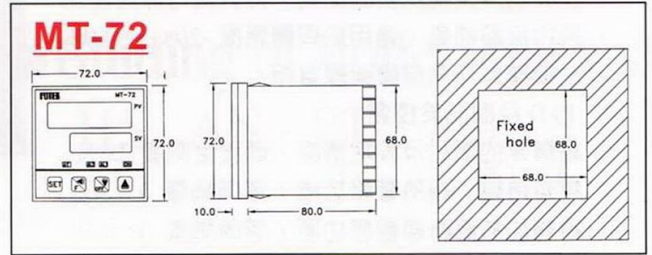
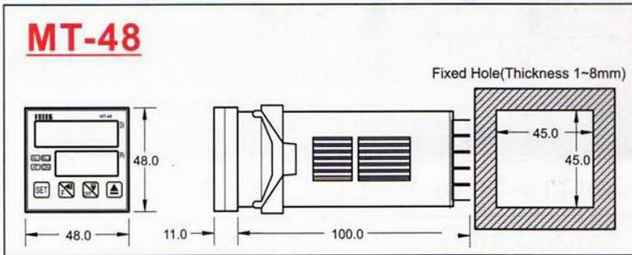
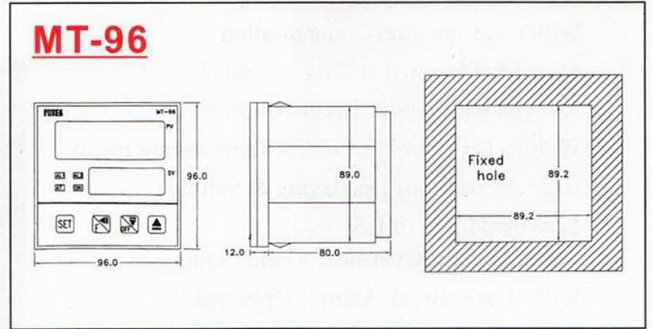
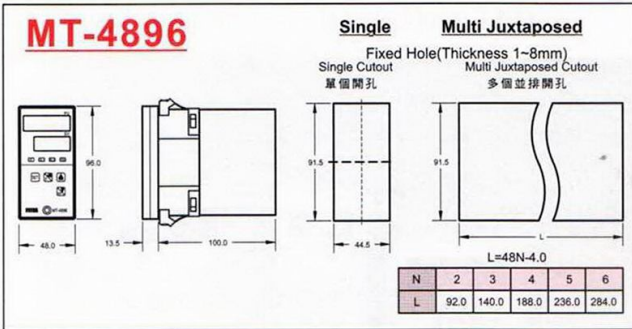
可關閉溫控器所有輸出，只顯示實際溫度值。

Atuo Tunning Key 自動演算鍵

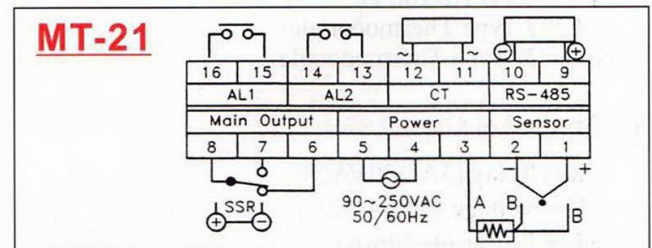
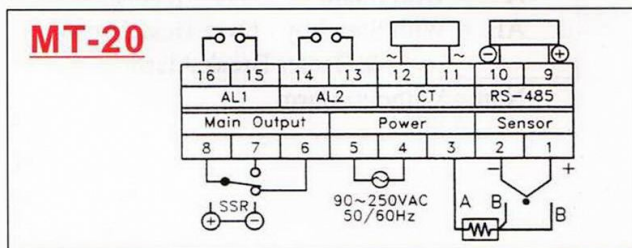
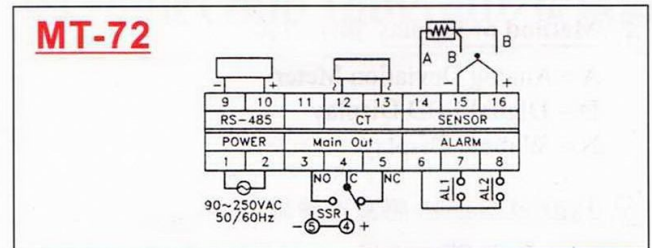
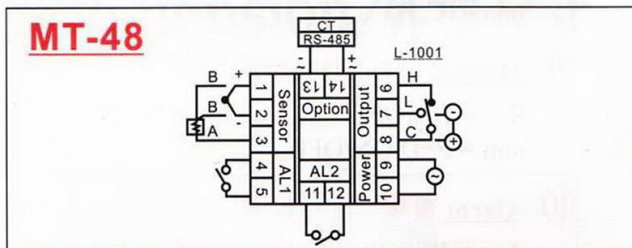
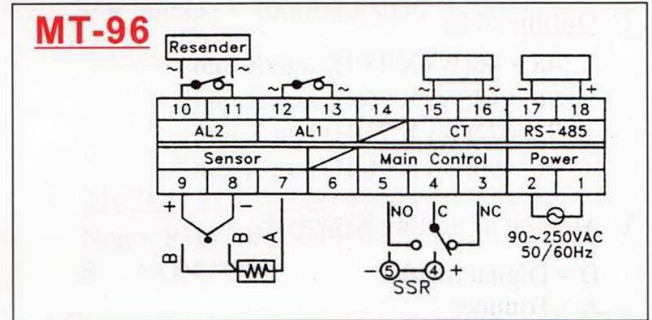
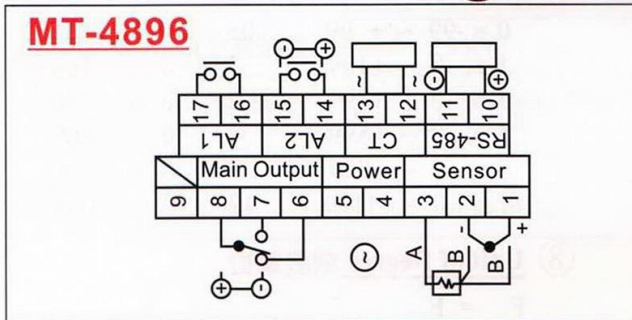
If Press The  Key 3 Seconds,It May Enter To The Status of Auto Tunning.

按  鍵3秒，可以進入自動演算狀態。

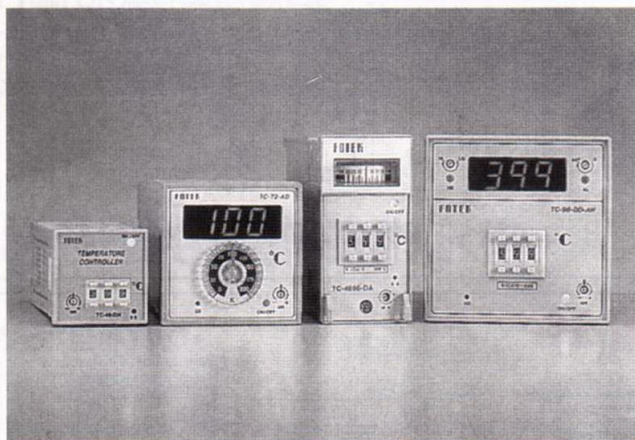
Outline & Fixed Hole/外型及固定孔尺寸圖



Connection Diagram/接線圖



- * High Reliability by S.M.T. & TQC.
- * With Cold Junction Compensation, Suited to Operated at -20 C ~ +60 C
- * All type with Sensor Break Alarm LED.
- * With P+D Control to Control Temperature Easily.
- * High Accuracy of Displaying & Setting Less than 0.5% of F.S.
- * With Stand-by/Over-heat Alarm.(Optioned).
- * With Heater Break Alarm.(Optioned).
- * 表面貼焊技術及全面品管，提供最可靠性產品
- * 具冷接點補償，適用於周圍溫度 -20 C ~ +60 C
- * 全機種具有測溫體斷線警報
- * P+D 控制易於控溫
- * 高精度的顯示及設定精度，低於全刻度 0.5%
- * 具有待機 / 過熱警報功能 (選擇機種)
- * 具有加熱器斷線警報功能 (選擇機種)



■ Guiding of Model

Ex. TC - 4896 DA - PT - R 3 - F - S - A

① ② ③④ ⑤ ⑥⑦ ⑧ ⑨ ⑩

① Product 產品代號

TC = Temperature Controller

② Outline 外型

48 = 48(W) X 48(H) mm X mm
 4896 = 48(W) X 96(H) mm X mm
 72 = 72(W) X 72(H) mm X mm
 96 = 96(W) X 96(H) mm X mm

③ Method of Setting 設定方式

D = Digital Swith
 A = Trimmer

④ Method of Display 顯示方式

A = Analog Deviation Meter
 D = Digital LED Display
 N = Without Display

⑤ Type of Sensor 感溫線種類

PT = RTD PT-100 Ω
 J = J Type Thermocouple
 Non = K Type Thermocouple

⑥ Method of Output 輸出方式

R = Relay (5A/250VAC)
 V = Voltage (20mA/12V)
 L = Linear (4~20mA)

⑦ Range of Setting 設定範圍

Digital Switch

0 = -99 ~ + 99
 1 = 0 ~ +199
 3 = 0 ~ +399
 5 = 0 ~ +599
 9 = 0 ~ +999
 11 = 0 ~ +1199

Trimmer

05 = -50 ~ +50
 1 = 0 ~ +100
 2 = 0 ~ +200
 4 = 0 ~ +400
 6 = 0 ~ +600
 12 = 0 ~ +1200

⑧ Unit of Degree 刻度單位

F = F
 non = C

⑨ Method of Control 控制方式

S = ON/OFF
 non = P+D ON/OFF

⑩ Alarm 警報

A = With Stand-by / Over Heat Alarm
 AH = With Stand-by / Over Heat Alarm
 & Heater Break Alarm
 Non = Without Alarm

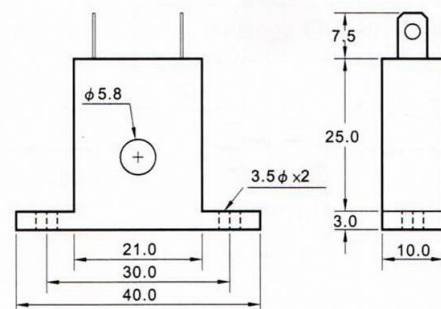
General Data & Attachment

TC Series

General Data 共同規格	Sensor Type 感溫線	K < CA > , J < IC > or PT-100 Ω
	Output Method 輸出方式	Relay < 5A / 250VAC > , Voltage < 20mA / 12V > , Linear < 4~20mA >
	Control Method 控制方式	P+D ON/OFF , ON/OFF or Proportion
	Proportion Band 比例帶	Appro 2.5% of F.S.
	Cycle Time 動作週期	2 Sec or 20 Sec < ON+OFF >
	Manual Reset 偏移修正	Trimmer., Range ±10 °
	Unit of Degree 單位	°C or °F
AL Alarm AL警報	Setting Method 設定方式	Trimmer (AL)
	Setting Range 設定範圍	0 ~ +50° , 0 ~ -50° or -50° ~ +50° of Setting Value
	Output Method 輸出方式	Relay , 0.5A/250VAC
HB Alarm Hb警報	Setting Method 設定方式	Trimmer (HB)
	Setting Range 設定範圍	0.5A~25A ; 1.0A~50A
	Output Method 輸出方式	Relay , 0.5A/250VAC
Electrical Data 電氣規格	Power Supply 工作電壓	110 / 220 VAC±20% 50 / 60Hz
	Current Consumption 耗電流	2.5VA max.
	Insulation Resistance 絕緣阻抗	Over 50M Ω / 500 VDC Between Power And Another Terminal
	Dielectrical Strength 耐壓強度	Over 2.5KV / 1min Between Power And Another Terminal
Mechanical Data 機械規格	Operating Temp./Hum 工作環境	-20°C ~+60°C ; 35%~85% RH
	Vibration Resistance 耐振動	10~55Hz / 1.5mm , 2Hrs in X.Y.Z Direction
	Panel Thickness 面板厚度	1.0~8.0mm

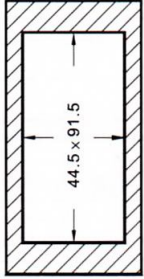
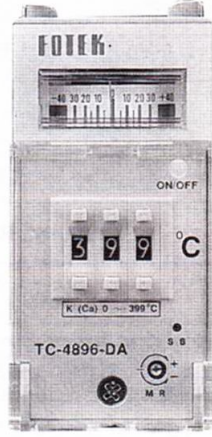
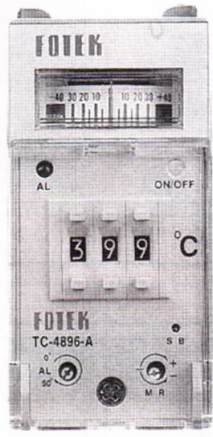
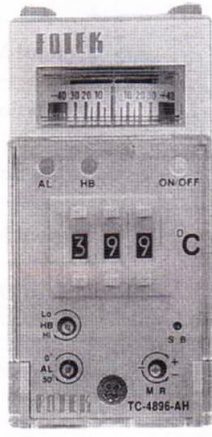
Attachment/附件

CT provided with Heater Break Alarm type only.
只有加熱器斷線警報功能機種附 CT



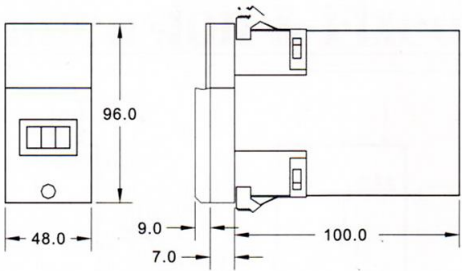
TC-4896 Series

DIN 48X96 Temperature Controller

Model	TC-4896-DA-□ -□	TC-4896-DA-□ -□ -A	TC-4896-DA-□ -□ -AH
DIN48 X 96 			
Alarm 警報	Non	AL Alarm	AL+HB
Display 顯示方式	Method 方式: Analog Deviation Meter		
	Tolerance 誤差: 1.0% of F.S.		
	Range 範圍: $\pm 40^{\circ}$		
Setting 設定方式	Method 方式: Digital Switch < 3 Digits >		
	Tolerance 誤差: 0.5% of Setting Range		
	Range 範圍: -99~+99, 0~199, 0~399, 0~599, 0~999		

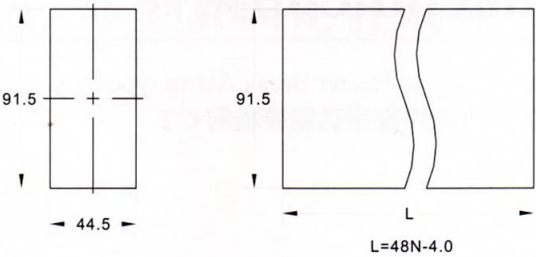
Dimension & Fixed Hole / 外型及固定孔尺寸

Outline



Fixed Hole (Thickness 1~8mm)
Single Cutout Multi Juxtaposed Cutout

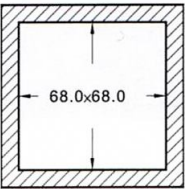

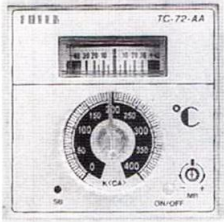

單個開孔 多個並排開孔

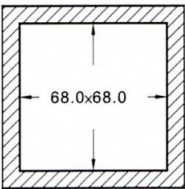
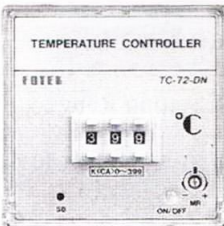

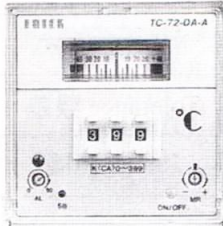


N	2	3	4	5	6
L	92.0	140.0	188.0	236.0	284.0

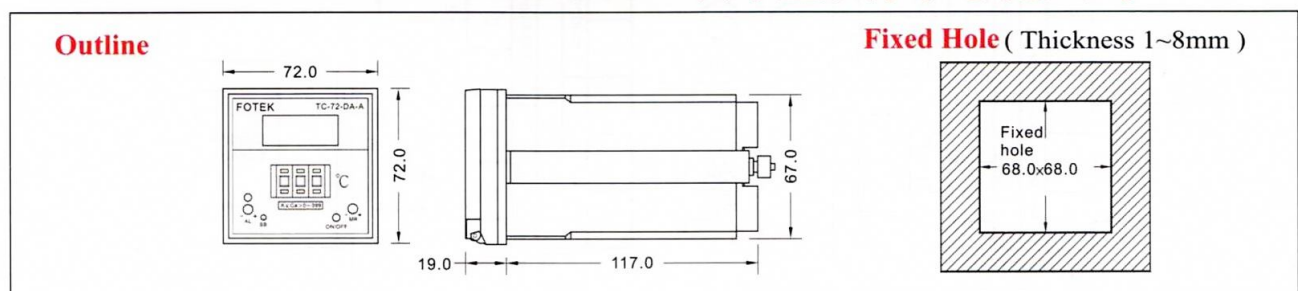
DIN 72X72 Temperature Controller

TC-72 Series

	Model	TC-72-AN-□ -□	TC-72-AA-□ -□	TC-72-AA-□ -□ -A
Outline 外型	DIN72 X 72 			
	Alarm 警報	Non	Non	AL Alarm
Display 顯示方式	Method 方式	Non	Analog Deviation Meter	
	Tolerance 誤差	Non	1.0% of F.S.	
	Range 範圍	Non	± 40°	
Setting 設定方式	Method 方式	Trimmer < Variable Resister >		
	Tolerance 誤差	1.0% of Setting Range		
	Range 範圍	0~100 , 0~200 , 0~400 , 0~600 , 0~1200		

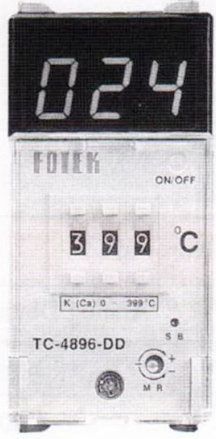
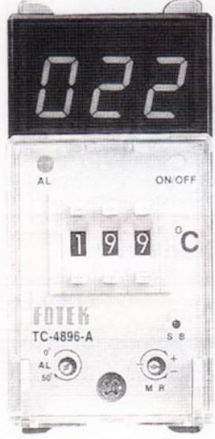
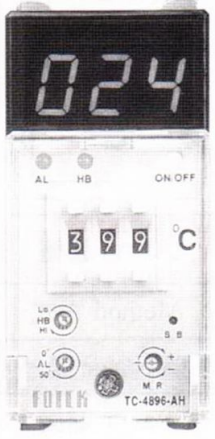

	Model	TC-72-DN-□ -□	TC-72-DA-□ -□	TC-72-DA-□ -□ -A
Outline 外型	DIN72 X 72 			
	Alarm 警報	Non	Non	AL Alarm
Display 顯示方式	Method 方式	Non	Analog Deviation Meter	
	Tolerance 誤差	Non	1.0% of F.S.	
	Range 範圍	Non	± 40°	
Setting 設定方式	Method 方式	Digital Switch		
	Tolerance 誤差	0.5% of Setting Range		
	Range 範圍	-99 ~+99 , 0~199 , 0~399 , 0~599 , 0~999 , 0~1199		

Dimension & Fixed Hole/外型及固定孔尺寸

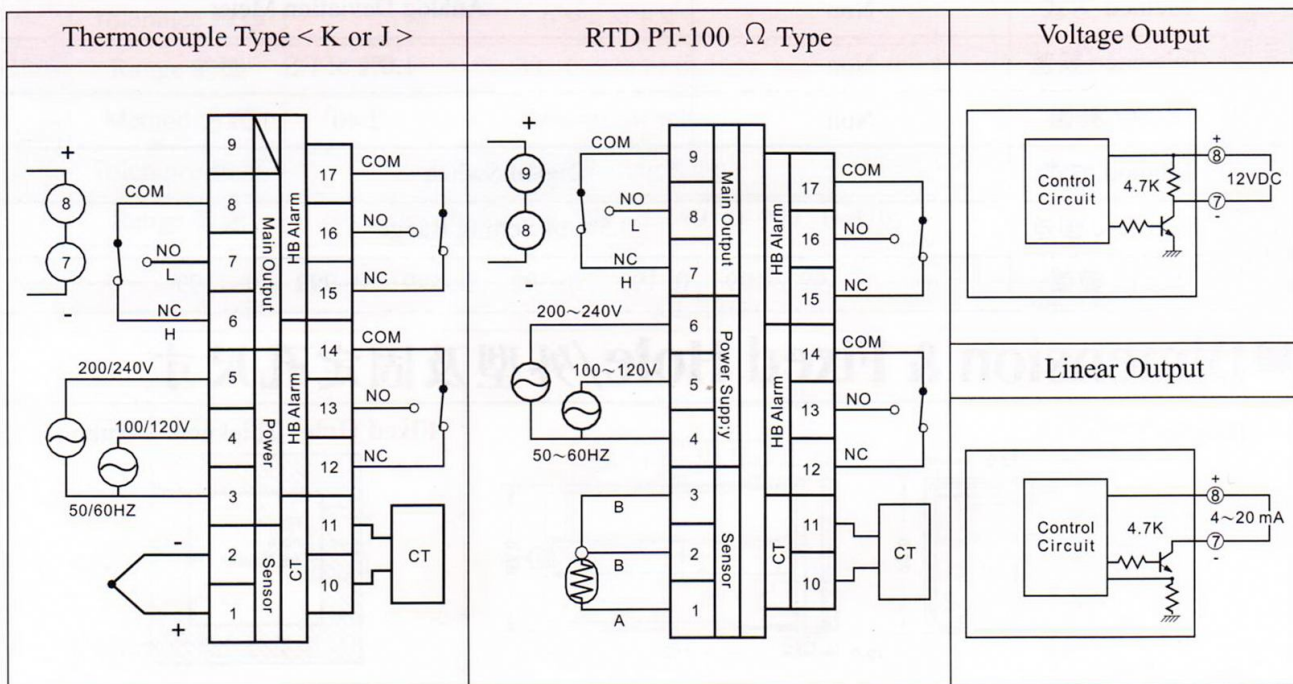


DIN 48X96 Temperature Controller

TC-4896 Series

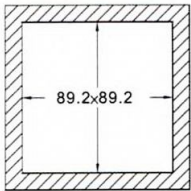



	Model	TC-4896-DD-□ -□	TC-4896-DD-□ -□ -A	TC-4896-DD-□ -□ -AH
Outline 外型	DIN48 X 96			
				
Alarm 警報		Non	AL Alarm	AL+HB
Display 顯示方式	Method 方式	14 mm 7 Segment Red LED		
	Tolerance 誤差	0.5% of F.S. + 1 Digit		
	Range 範圍	-99~+99 , 0~999		
Setting 設定方式	Method 方式	Digital Switch < 3 Digits >		
	Tolerance 誤差	0.5% of Setting Range		
	Range 範圍	-99~+99 , 0~199 , 0~399 , 0~599 , 0~999		

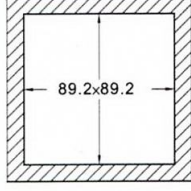



■ Connection Diagram & Output Circuit/接線圖及輸出回路



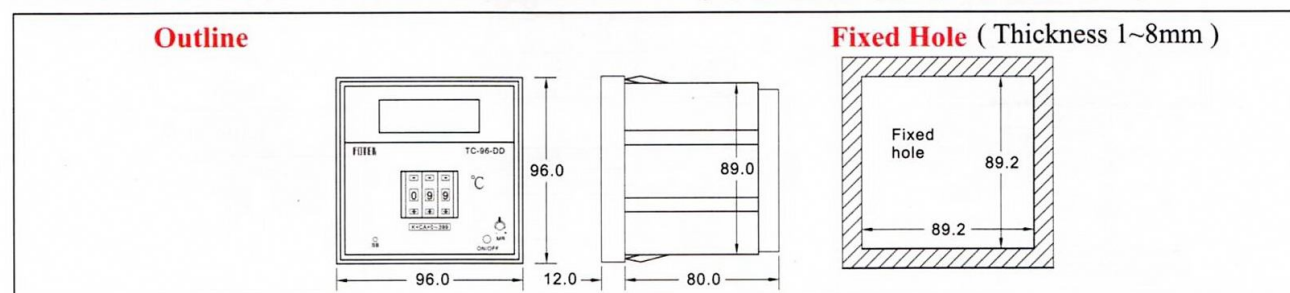
DIN 96X96 Temperature Controller

TC-96 Series



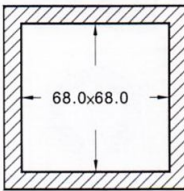
	Model	TC-96-AD-□ -□	TC-96-AD-□ -□ -A	TC-96-AD-□ -□ -AH
Outline 外型	DIN96 X 96 			
	Alarm 警報	Non	AL Alarm	AL+HB Alarm
Display 顯示方式	Method 方式	14mm 7 Segment Red LED		
	Tolerance 誤差	0.5% of F.S.		
	Range 範圍	-99 ~+99 , 0~999 , 0~1200		
Setting 設定方式	Method 方式	Trimmer < Variable Resister >		
	Tolerance 誤差	1.0% of F.S.		
	Range 範圍	-50 ~+50 , 0~100 , 0~200 , 0~400 , 0~600 or 0~1200		



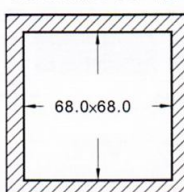
	Model	TC-96-DD-□ -□	TC-96-DD-□ -□ -A	TC-96-DD-□ -□ -AH
Outline 外型	DIN96 X 96 			
	Alarm 警報	Non	AL Alarm	AL+HB Alarm
Display 顯示方式	Method 方式	14mm 7 Segment Red LED		
	Tolerance 誤差	0.5% of F.S.		
	Range 範圍	-99 ~+99 , 0~999 , 0~1200		
Setting 設定方式	Method 方式	Digital Switch		
	Tolerance 誤差	0.5% of F.S.		
	Range 範圍	-99 ~+99 , 0~199 , 0~399 , 0~599 , 0~999 , 0~1199		

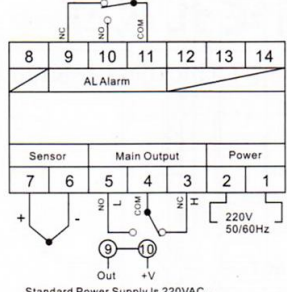
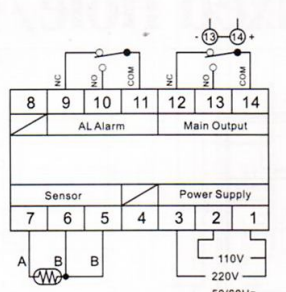
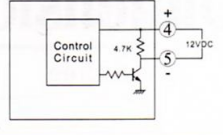
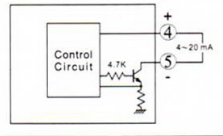
■ Dimension & Fixed Hole / 外型及固定孔尺寸



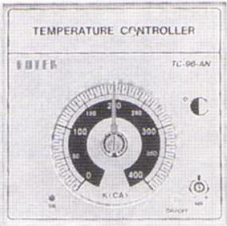

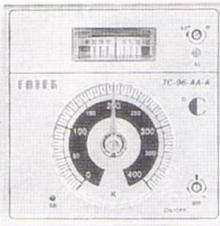
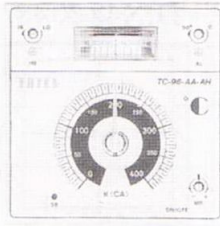
TC-72 Series





	Model	TC-72-AD-□ -□	TC-72-AD-□ -□ -A
Outline 外型	DIN72 X 72		
			
	Alarm 警報	Non	AL Alarm
Display 顯示方式	Method 方式	14mm 7 Segment Red LED	
	Tolerance 誤差	0.5% of F.S.	
	Range 範圍	0~999 or 0~1999	
Setting 設定方式	Method 方式	Trimmer < Variable Resister >	
	Tolerance 誤差	1.0% of F.S.	
	Range 範圍	0~100 , 0~200 , 0~400 , 0~600 , 0~1200	

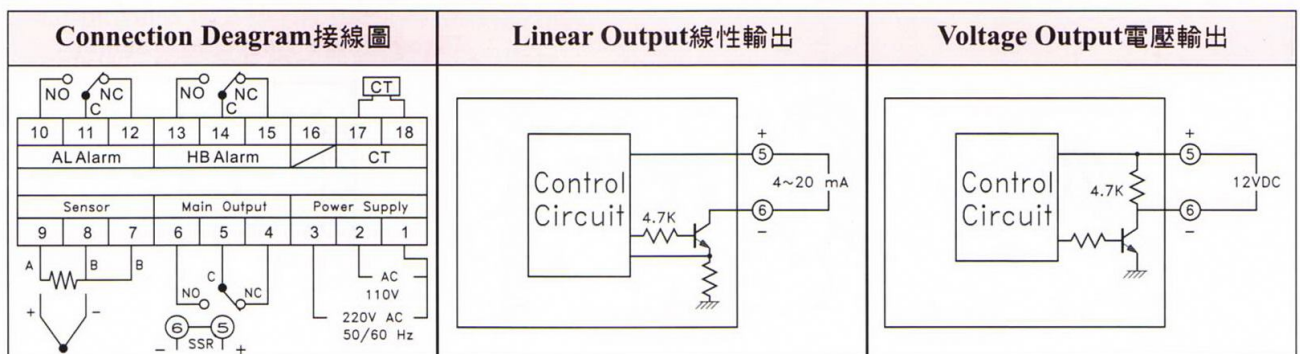
	Model	TC-72-DD-□ -□	TC-72-DD-□ -□ -A
Outline 外型	DIN72 X 72		
			
	Alarm 警報	Non	AL Alarm
Display 顯示方式	Method 方式	14mm 7 Segment Red LED	
	Tolerance 誤差	0.5% of F.S.	
	Range 範圍	-99~99 , 0~999 or 0~1999	
Setting 設定方式	Method 方式	Digital Switch	
	Tolerance 誤差	0.5% of Setting Range	
	Range 範圍	-99 ~+99 , 0~199 , 0~399 , 0~599 , 0~999 , 0~1199	

K type	PT type	Voltage Output
 <p>Standard Power Supply Is 220VAC If Need 110VAC, Please Change It On. The Inner PC Board.</p>		
		Linear Output
		

TC-96 Series





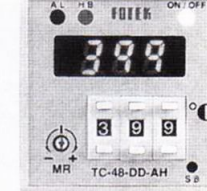
TC-96-AN-□ □	TC-96-AA-□ □	TC-96-AA-□ □ -A	TC-96-AA-□ □ -AH
			
Non	Non	AL Alarm	AL+HB Alarm
Non	Analog Deviation Meter		
Non	1.0% of F.S.		
Non	$\pm 40^\circ$		
Trimmer < Variable Resister >			
1.0% of F.S.			
-50 ~+50 , 0~100 , 0~200 , 0~400 , 0~600 or 0~1200			

TC-96-DN-□ □	TC-96-DA-□ □	TC-96-DA-□ □ -A	TC-96-DA-□ □ -AH
			
Non	Non	AL Alarm	AL+HB Alarm
Non	Analog Deviation Meter		
Non	1.0% of F.S.		
Non	$\pm 40^\circ$		
Digital Switch			
0.5% of F.S.			
-99 ~+99 , 0~199 , 0~399 , 0~599 , 0~999 , 0~1199			

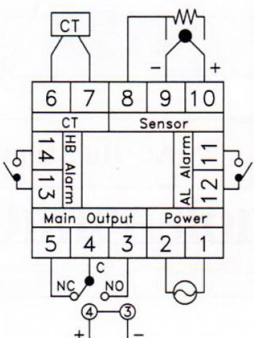
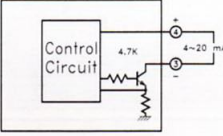
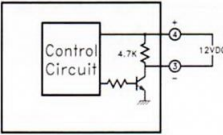


TC-48 Series

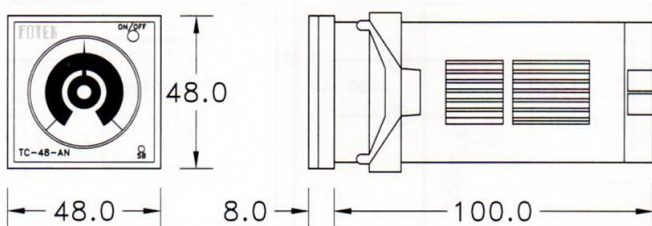
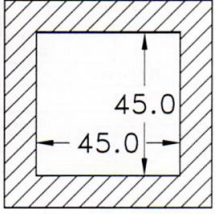
DIN 48X48 Temperature Controller

Model	TC-48-AN-□ -□	TC-48-DN-□ -□	TC-48-DD-□ -□	TC-48-DD-□ -□ -AH
Outline 外型 DIN48 X 48 				
Alarm 警報	Non	Non	Non	AL+HB Alarm
Display 顯示方式	Method 方式	Non	Non	0.36" 7-Segment Red LED
	Tolerance 誤差	Non	Non	0.5% of F.S.
	Range 範圍	Non	Non	-99~+99 , 0~999
Setting 設定方式	Method 方式	Trimmer	Digital Switch	
	Tolerance 誤差	1.0%	0.5% of Setting Range	
	Range 範圍	100 , 200 , 400	-99 ~+99 , 0~199 , 0~399 , 0~599 , 0~999	

Connection Diagram/接線圖

K / J & PT-100 Type	Linear Output
 <p>Standard Power Supply Is 220VAC , If Need 110VAC , Please Change It On The Inner PC Board.</p> <p>標準工作電壓是220VAL , 如果要用110VAL , 可在 基板上變更。</p>	
	Voltage Output
	

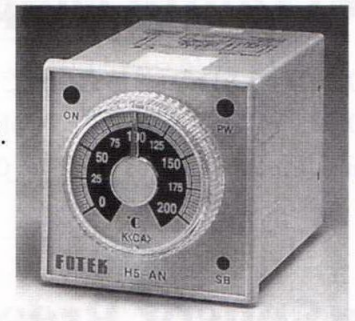
Dimension & Fixed Hold/外型及固定孔尺寸

<p>Outline</p> 	<p>Fixed Hole (Thickness 1~8mm)</p> 
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DIN 48X48 Temperature Controller

H5-AN series

- ☆ DIN 48X48
- ☆ All Type With Sensor Break Alarm LED
全機種附斷線警報指示燈
- ☆ With Cold Junction Compensation, Suited To Operated At $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$.
附冷接點補償，適用 $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$
- ☆ Setting Accuracy Less Than 1.0% of F.S.
設定精度少於1.0%
- ☆ With P+D Control To Control Temperature Easily.
PFD控制方式，可精確控溫



■ Specification/規格

Model型號	H5 - AN - □ □ - □ □
Sensor Type感溫線	K<CA>orJ<IC>or PT-100Ω
Control Method控制方式	P+D ON/OFF or ON/OFF
Output Method輸出方式	Relay < 5A/250 VAC > or Voltage < 20 mA/12V >
Cycle Time動作週期	2 sec or 20 sec
Degree Unit單位	$^{\circ}\text{C}$
Power Supply工作電壓	110 / 220 VAC 20%, 50/60Hz
Current Consumption耗電流	2.5 VA max.
Insulation Resistance絕緣阻抗	100MΩ / 500 VDC
Dielectric Strength耐壓強度	2.5 KV / 1 min
Vibration Resistance抗振動	10~55 Hz/1.5mm, 2Hrs
Operating Temp/Hum工作環境	$-20 \sim +60^{\circ}\text{C}$; 35%~85% RH
Weight重量	Appr. 185g

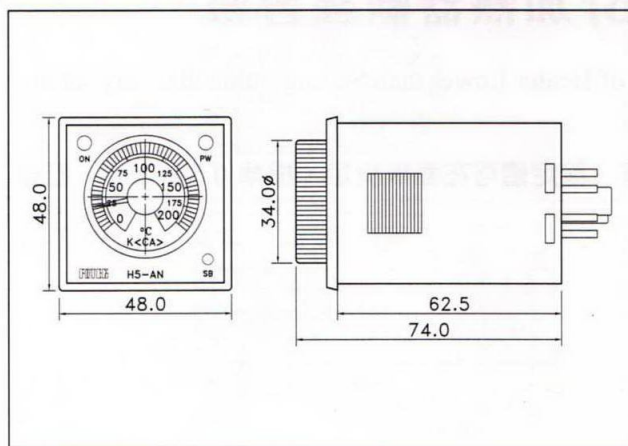
■ Guiding of Model/型號索引

H5 - AN - PT - R 4 - S

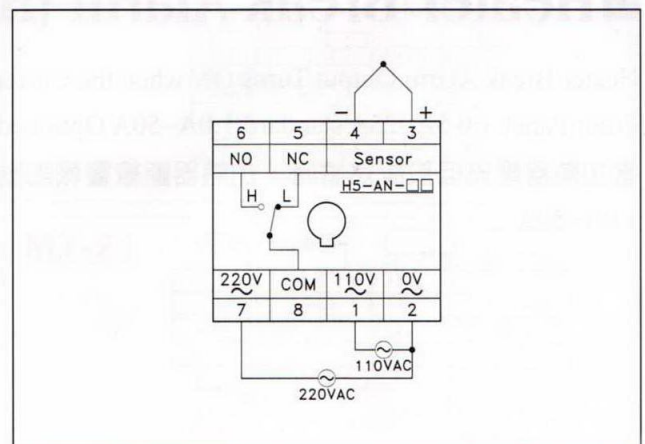
① ② ③ ④ ⑤ ⑥

- ① Series 系列
H5 series
- ② Method of Setting 設定方式
AN = Trimmer Type
- ③ Type of Sensor
NOU = K Type
J = J Type
PT = PT Type
- ④ Method of Output 輸出方式
R = Relay < 5A/250 VAC >
V = Voltage < 20mA/12 VDC >
- ⑤ Range of Setting 設定範圍
1 = 0 ~ 100
2 = 0 ~ 200
4 = 0 ~ 400
- ⑥ Method of Control 控制方式
Non = P+D ON / OFF
S = ON / OFF

■ Dimension/外型尺寸



■ Connection Diagram/接線圖



Control Output 控制輸出

ON/OFF LED Turn to Green Color , Control Output Turn ON. 綠色動作燈，表示控制輸出動作。
 ON/OFF LED Turn to Red Color , Control Output Turn OFF. 紅色動作燈，表示控制輸出復歸。
 but , Linear Output Type That ON/OFF LED Turn to Green Color. 但，線性輸出型，動作燈亮綠色。

Sensor Break Alarm (SB) 測溫體斷線指示燈

SB LED Turn ON when Sensor Break 測溫體斷線時，SB燈會亮著。

Stand-by/Over-heat Alarm (AL) 待機 / 過熱警報

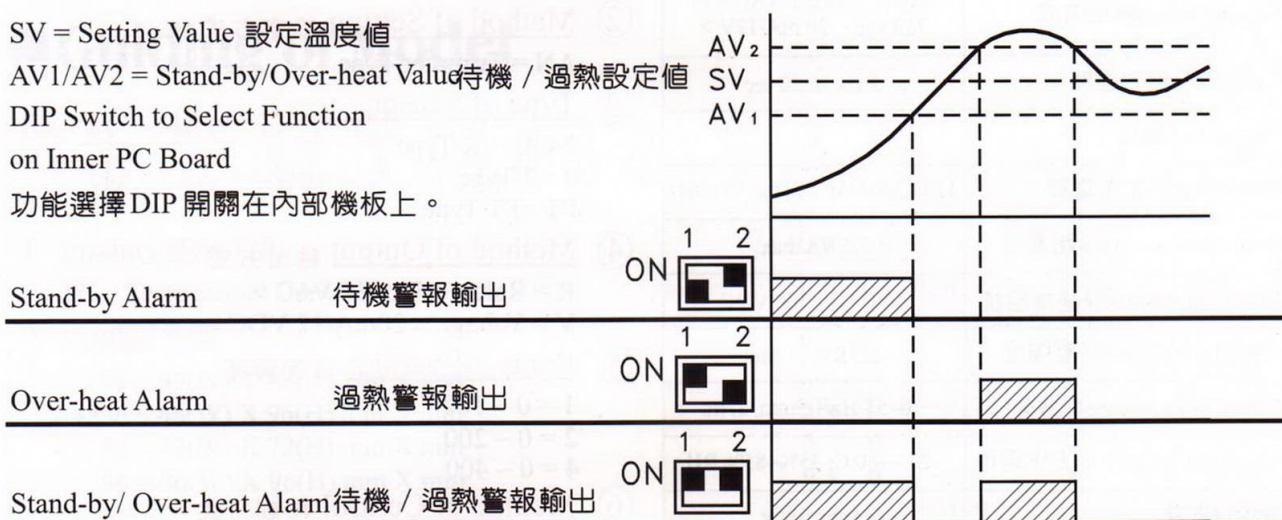
SV = Setting Value 設定溫度值

AV1/AV2 = Stand-by/Over-heat Value 待機 / 過熱設定值

DIP Switch to Select Function

on Inner PC Board

功能選擇 DIP 開關在內部機板上。



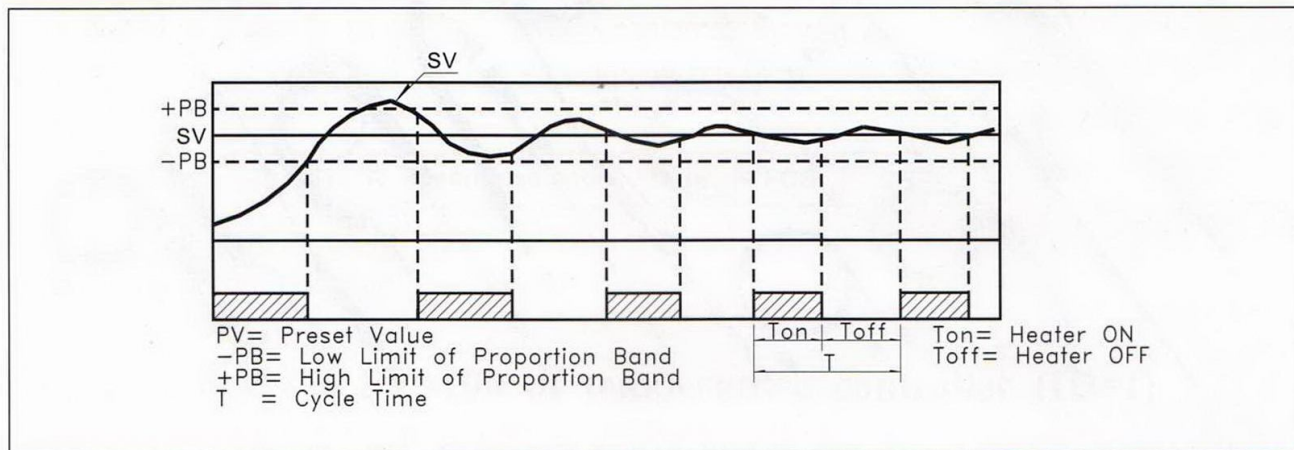
Heater Break Alarm (HB) 加熱器斷線警報

Heater Break Alarm Output Turns ON when the Current of Heater Lower than Setting Value that may set at Front Panel. (0.5A~25A standard/1.0A~50A Optioned)

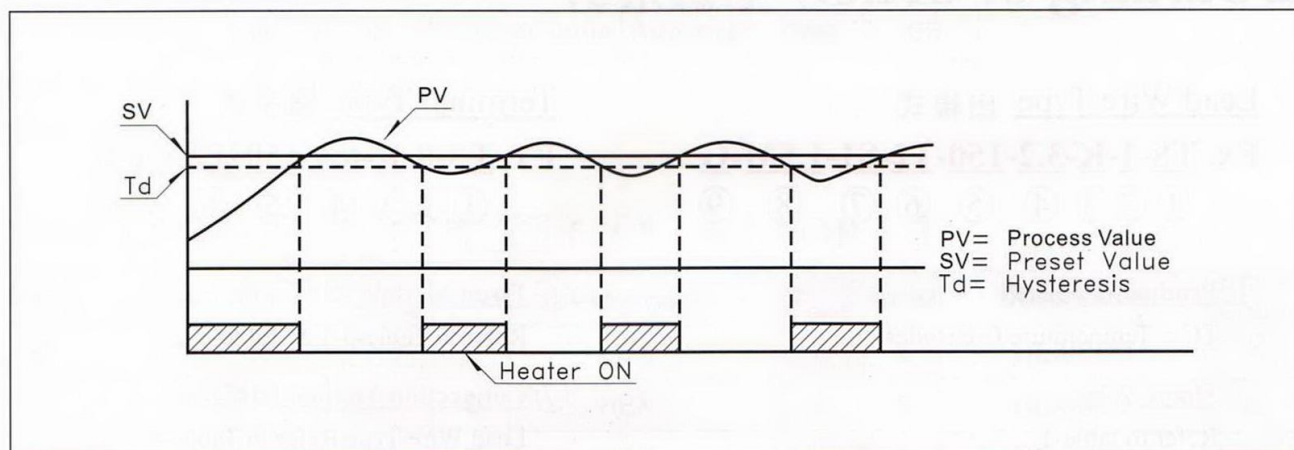
當加熱器電流低於設定值時，加熱器斷線警報即動作，設定值可在面板設定，標準 0.5A~25A，訂做 1.0A~50A

■ Illustration/説明

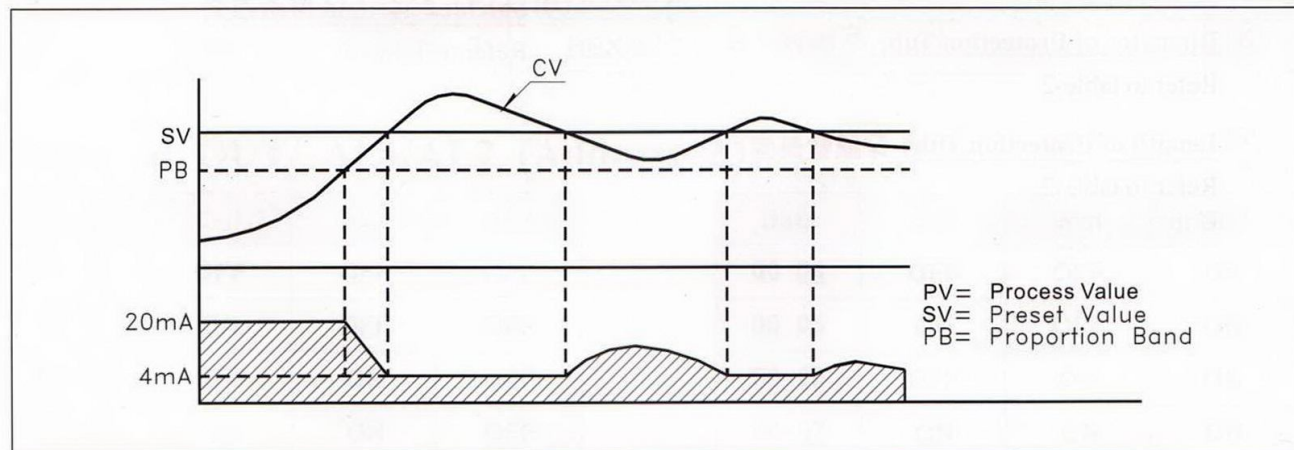
P+D ON/OFF

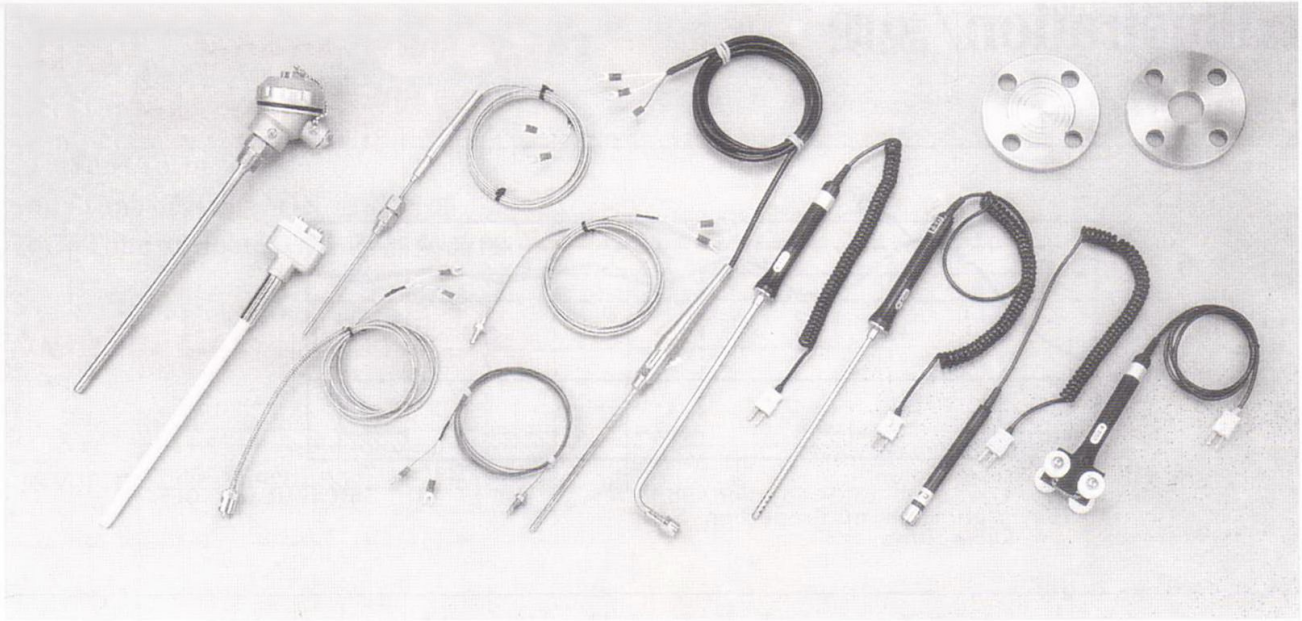


ON/OFF (S)



Proportion





■ Guiding of Order/型號索引

Lead Wire Type 出線式

Ex. TS-1-K-3.2-150-T2-S1-1.5M-G

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① Product 產品代號

TC = Temperature Controller

② Shape 外型

Refer to table-1

③ Sensor Type 測溫體種類

K = K Type Thermocouple

J = J Type Thermocouple

PT = RTD PT-100

④ Diameter of Protection Tube 保護管外徑

Refer to table-2

⑤ Length of Protection Tube 保護管長度

Refer to table-2

Unit = mm

Terminal Type 端子式

Ex. TS-8-K-6.4-150-T2-C1-U

① ② ③ ④ ⑤ ⑥ ⑦ ⑨

⑥ Fixed Method 固定方式

Refer to Table-3-1 & Table-3-2

⑦ Connection Method 出線方式

Lead Wire Type Refer to Table-4-1

Terminal Type Refer to Table-4-2

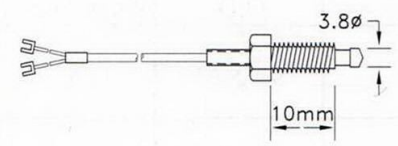
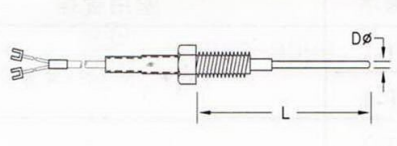
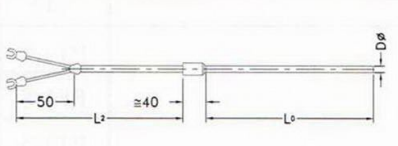
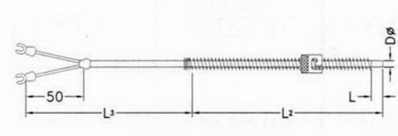
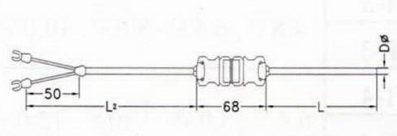
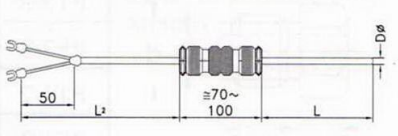
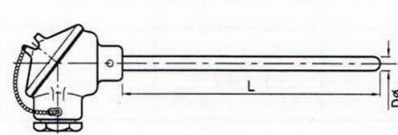
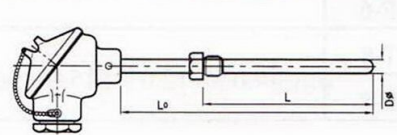
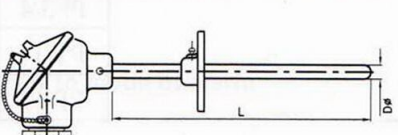
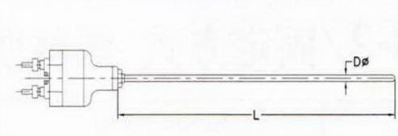
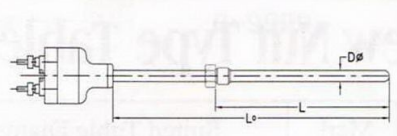
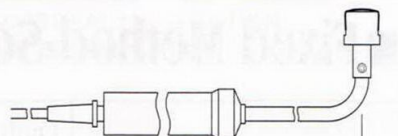
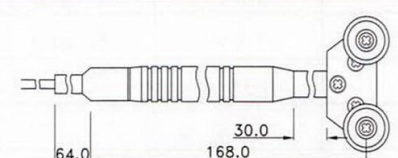
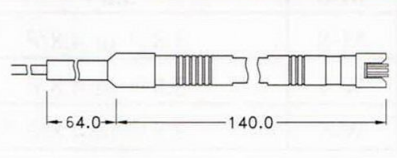
⑧ Length of Lead Wire 出線長度

Lead Wire Type Refer Tto Table4-1

⑨ Shielded Method 屏蔽方式

Refer to Table-5

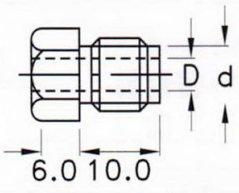
■ Shape Table-1 / 外型

TS-1	Screw type 螺絲型	TS-2	Screw type 管方型	TS-3	Inserting type 插入型
					
TS-4	Push lock type 壓扣型	TS-5	Fast connector type 快速接頭型	TS-6	Fast connector type 快速接頭型
					
TS-7	Closed Terminal type 圓頭型	TS-8	Closed Terminal type 圓頭型	TS-9	Closed Terminal type 圓頭型
					
TS-10	Exposed terminal type 扁頭型	TS-11	Exposed terminal type 扁頭型	TS-12	Surface type 表面型
					
TS-13	Surface type 表面輪型	TS-14	Surface type 表面型	TS-N	Special type
				Except the above shape , we accept Your order to manufacture. 除上述形狀，我們可接受特殊形狀訂做。	

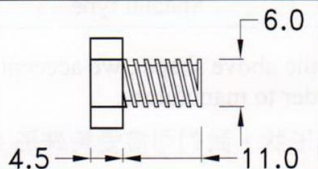
■ Dimension of Protection Tube Table-2 / 保護管尺寸

Specification 規格	Data
Diameter (外徑)	1.6φ, 3.2φ, 4.8φ, 6.4φ, 8.0φ, 10.0φ, 12.0φ, 15.0φ, 22.0φ
Length (長度)	Any Length is Available , Accept Order to Manufacture. Unit : mm

■ Fixed Method-Sealed Screw Type Table 3-1 / 固定方式 - 管牙型

Dimension	Outline <d>	Mark 標示	Suited Tube Diameter 適用管徑	Screw (牙規)	
				O.D.	Pitch <mm>
	PT1/8	T-1	1.6 φ, 3.2 φ, 4.8 φ	9.728 φ	0.9071
	PF1/8	F-1			
	PT1/4	T-2	3.2 φ, 4.8 φ, 8.0 φ, 10.0 φ	13.157 φ	1.3368
	PF1/4	F-2			
	PT3/8	T-3	4.8 φ, 6.4 φ, 8.0 φ, 10.0 φ, 12.0 φ	16.662 φ	1.3368
	PF3/8	F-3			
	PT1/2	T-4	6.4 φ, 8.0 φ, 10.0 φ, 12.0 φ, 15.0 φ	20.955 φ	1.8143
	PF1/2	F-4			
	PT3/4	T-6	8.0 φ, 10.0 φ, 12.0 φ, 15.0 φ	26.441 φ	1.8143
	PF3/4	F-6			
	PT 1"	T-8	10.0 φ, 12.0 φ, 15.0 φ, 22.0 φ	33.249 φ	2.3091
	PF 1"	F-8			

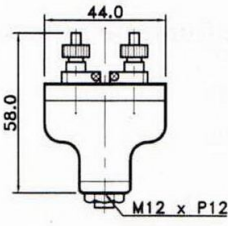
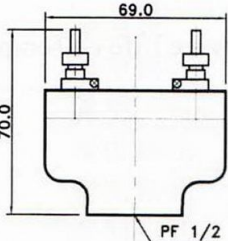
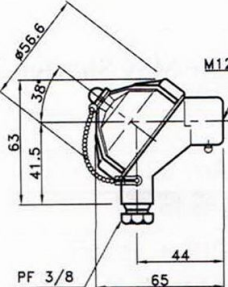
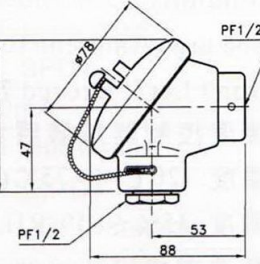
■ Fixed Method-Screw Nut Type Table 3-2 / 固定方式 - 螺絲型

Dimension	Outline <d>	Mark 標示	Suited Tube Diameter 適用管徑	Screw (牙規)	
				O.D.	Pitch <mm>
	M6	M-6	3.8 φ	5.8 φ	0.5mm
	M8	M-8	3.8 φ or 4.8 φ	7.8 φ	1.0mm
	W1/4	W-4	3.8 φ or 4.8 φ	6.35 φ	
	W5/16	W-5	3.8 φ or 4.8 φ	7.9 φ	

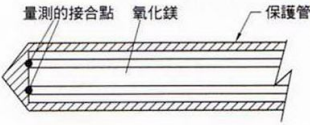
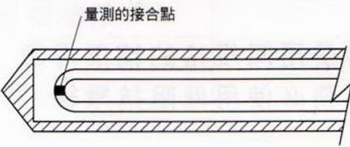
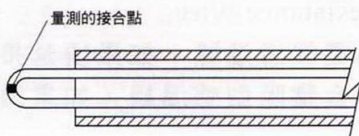
■ Connection Method-Lead Wire Type Table 4-1 接線方式 - 出線式

Mark 代號	Feature 特性	Temp.max 最高耐溫	Core 導線蕊絨	Length of Lead Wire 出線長度
S1	Stainless Net Coat 不銹鋼鋼線	150 C	0.32 X 4	Standard Length 標準長度 1M, 1.5M, 2M, 5M Any Length is Available Accept Order to Manufacture with Charge 任何長度皆可接受收費訂做。
S2			0.65 X 1	
T1	Tafolon Coat 鐵氟龍線	200 C	0.32 X 4	
T2			0.65 X 1	
P-1	PVC Coat PVC 線	90 C	0.32 X 4	
P-2			0.65 X 1	

■ Connection Method-Terminal Type Table 4-2

E2	Exposed Type	E2	Exposed Type	C1	Closed Type	C2	Closed Type
	 <p>Dia. of Tube $\leq 12 \phi$ 最大管徑 $\leq 12 \phi$</p>		 <p>Dia. of Tube $\leq 22 \phi$ 最大管徑 $\leq 22 \phi$</p>		 <p>Dia. of Tube $\leq 12 \phi$ 最大管徑 $\leq 12 \phi$</p>		 <p>Dia. of Tube $\leq 22 \phi$ 最大管徑 $\leq 22 \phi$</p>

■ Shielded Method Table 5

G	Grounded Type 接地型	U	Ungrounded Type 非接地型	E	Exposed Type 露出型
					

■ Remarks

Compensation Wire

Including PVC or TAFOLON Cable with $0.32 \phi \times 8$ or $0.65 \phi \times 2$

If you need to extend the Lead Wire of Temperature Sensor,

Compensation Wire is Required.

Sheathed Type Protection Tube

Protection Tube is Filled with MO_2 , If is Curvable.

Suited to Any Condition.

Notice

■ Notice of Use / 使用注意事項

1. Please Install The Temperature Controller In The Circumstance

Temperature: $-20^{\circ}\text{C} \sim +75^{\circ}\text{C}$ (Without Icing or Condensation)

Humidity: $35\% \sim 85\% \text{RH}$

The high Ambient Temperature May Shorten The Service Life of Temperature Controller, Please Don't Let It Exceed 75°C

溫度控制器安裝環境

溫度: $-20^{\circ}\text{C} \sim +75^{\circ}\text{C}$ (無結冰或結露)

濕度: $35\% \sim 85\% \text{RH}$

高溫環境可能縮短溫度控制器壽命，請不要讓工作的環境溫度超過 75°C

2. The Service Life of Relays Are Affected By The Switching Load.

Please Assure The Switching Load Are Under The Rated Current.

繼電器壽命受工作負載影響很大，請勿超載使用。

3. Thermcouple Type, If Need To Extend The Thermcouple Lead Wire Please Be Sure To Use The Compensation Wires That Must To Match The Thermcouple Type.

PT Resistance Type, If Need To Extend The PT Sensor Lead Wire Please Be Sure To Use The Low Resistance Wire.

熱電偶感溫線，如果須延長時務必使用同規格的補償導線。

白金電阻型感溫線，如果須延長時務必使用低阻抗電線。

4. The Lead Wire of Temperature Sensor, Please Separate It Away From The Power Lines or High Tension Lines To Avoid Noise Interruption.

感溫線請勿與和高壓線或動力線結紮在一起。

5. It is Suggested To Settle The Separated Alarm System, In Case of The Alarm of Temperature Controller May Not Be Operated Properly When The Device is Abnormal.

建議設置獨立的警報系統，以免溫控器異常時警報器功能失效。

6. The Temperature Controller May Be Interrupted By Movable Phone or Wireless Device.

溫控器可能會受行動電話或無線發射器干擾。

7. Outline of Crimp Terminal 端子夾外型



■ Notice Of Safety/安全注意事項

Definition of Symbol Marks



WARNING

Potentially Hazardous Situation

In Case Of Mishandling,May Result In Death
Or Serious Injury

潛在危險

如果操作失誤，有可能導致死亡或嚴重傷害。



CAUTION

Potentially Hazardous Situation

In Case of Mishandling,May Result In Slight Dangerous.

潛在危險

如果操作失誤，有可能導致輕微傷害。



WARNING

1.Please Do Not Touch The Terminals While The Power Is Supplied, If Do,It May Result In Electronic Shock.

送電中，請勿碰觸接線端以免觸電。

2.Please Do Not Let The Metal or Wire Cuttings Drop Into The Insid of Temperature Controller, If Do,It May Resule In Malfunction,Burnning Out or Fire.

請勿讓鐵屑或鋼絲掉入溫控器內，以免造成溫控器失效，燒毀甚至起火。

3.Please Make Sure To Wire The Temperature Controller Correctly Before Power ON,If Not, It May Result In Malfunction or Burnning out.

送電前請確認配線是否正確，否則可能導致異常或燒毀。

4.Please Do Not Modify or Repair The Temperature Controller,To Avoid Resulting In Malfunction or Burnning out.

請勿修改或修理溫控器，以免造成異常燒毀。



CAUTION

1.Please Rate The Power Supply Voltage Wirhin The Specified Range,If Not,It May Result In Malfunction or Burnning.

工作電壓請限制在規格內，否則可能造成溫控器異常或燒毀。

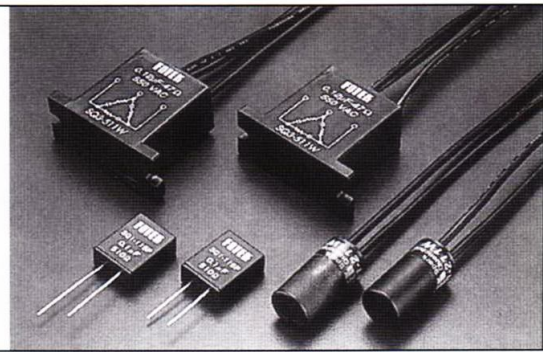
2.Please Rate The Load Within The Specified Value,If Not,It May Result In Malfunction or Burnning.

工作負載請勿超過額定電流，否則可能造成溫控器異常或燒毀。

3.Please Settle a Seperated Alarm Syatem To Ensure Safety Protection In The Event of Malfunction,If Not,It May Result In A Serious Accident.

請設置獨立警報系統，確保溫控器異常時安全保護，否則可能造成嚴重意外事故。

- * To Extend The Life of Contact.
- * To Quench The Spark of Contact.
- * To Quench The Noise of Power Line.
- * To Quench The Surge of Voltage.



■ Specification

Type	Lead Wire Type			PCB Type
Model	SQ1-211W	SQ3-351W	SQ3-511W	SQ1-115P
Phase	Single phase	Three phase		Single phase
Operating Voltage max.	250VAC	300VAC	550VAC	250VAC
Value of Condenser	0.1 μ F	0.47 μ F	0.1 μ F	0.1 μ F
Value of Resister	100 Ω	100 Ω	100 Ω	510 Ω
Wattage of Resister	2W			
Frequence of Voltage	50 / 60 Hz			
Max. Durated Voltage	750 Vp-p / 1ms	900 Vp-p / 1ms	1500 Vp-p / 1ms	500 Vp-p / 1ms
Isolation Strength	100M Ω /500VDC			
Dielectric Strength	2.5KVAC / 1min.			
Operating Temp/Hum.	-25 C ~ +70 C ; -35 C ~ +95 C			
Material of Housing	Intensive PBT			
Length of wire	10cm			
Weight	Appr.13g	Appr.35g	Appr.35g	Appr.4.5g

■ Guiding of Order

Ex. SQ 3 - 5 5 1 W
 ① ② ③ ④ ⑤ ⑥

① Product

② Phase

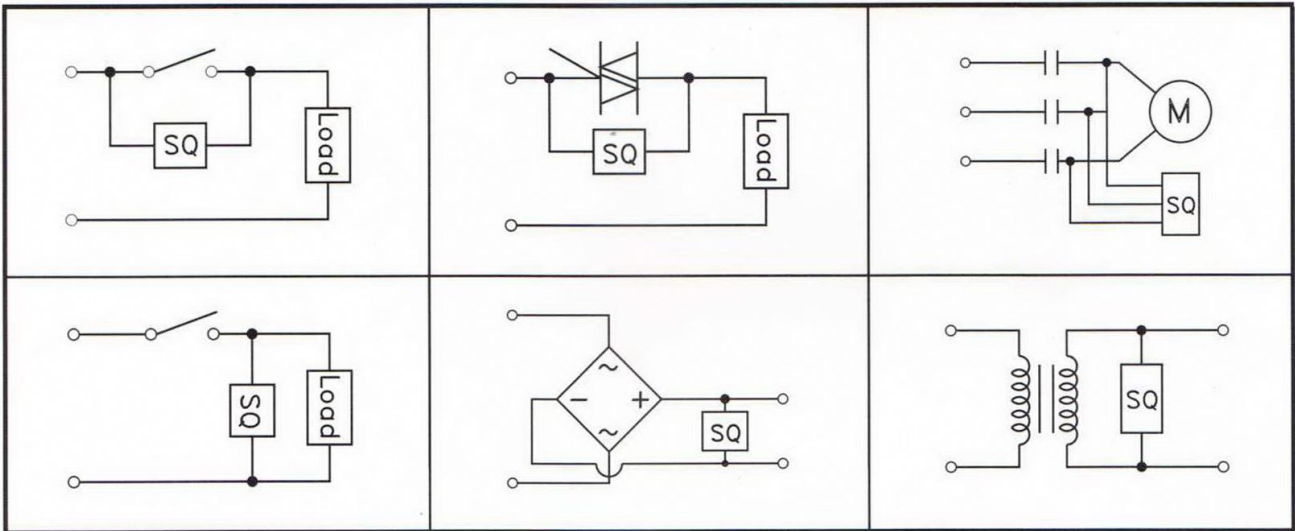
③ Operating Voltage

④ Value of Condenser

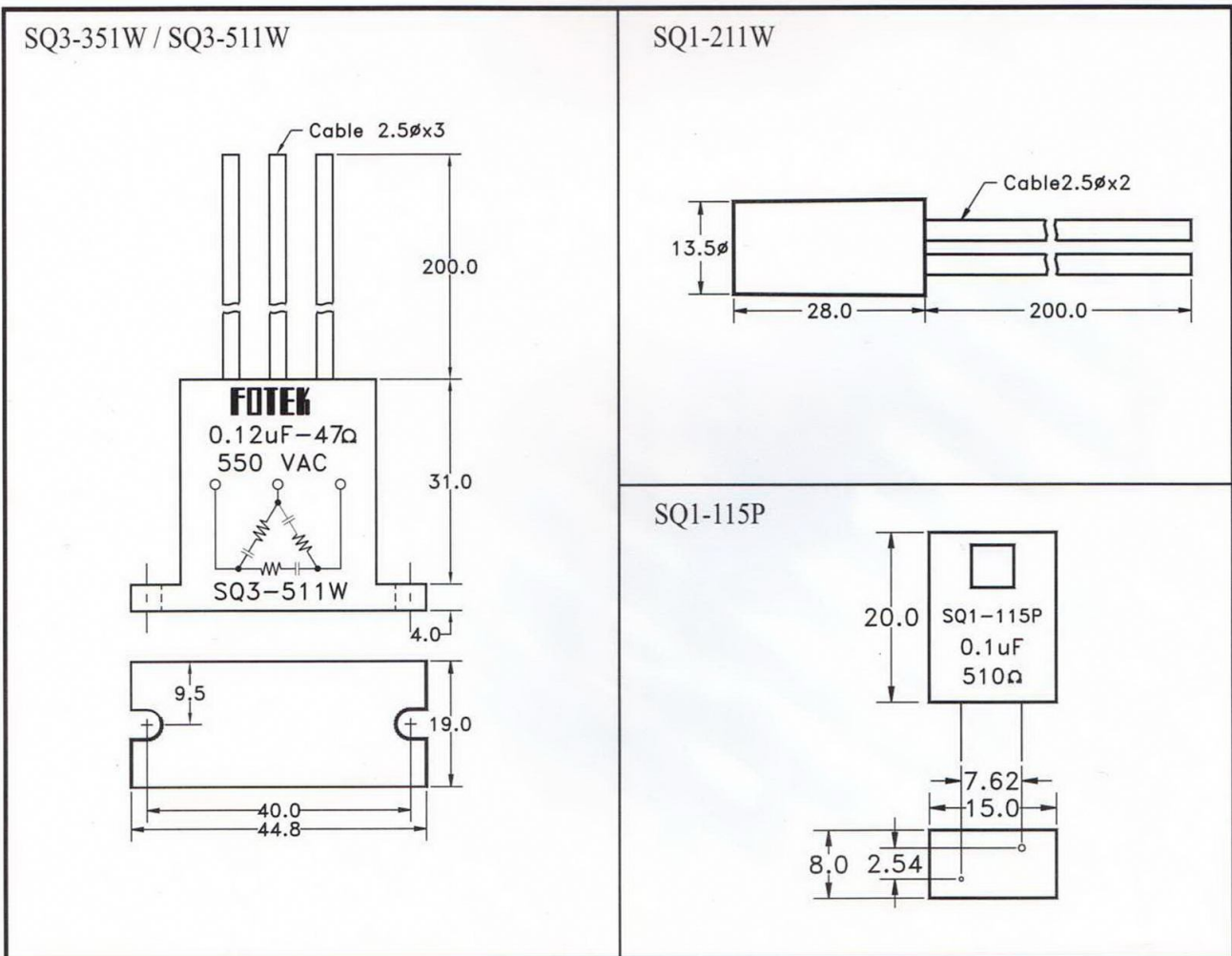
⑤ Value of Resister

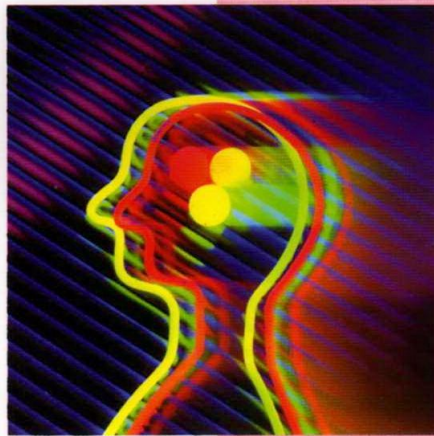
⑥ Mounting Method

Application



Dimension





量產化、標準化、製造世界標準電控器材。
先進技術、嚴格品管，提供最佳品質保證。

**To Manufacture The World-Standard Controls
By Mass-Producing & Standardizing**

**To Offer Excellent Quality Assurance
By Advanced Manufacture Technology &
Strict Total Auality Control**