

### Operating Manual for MT48-R



- **Easy Control**  
**Fuzzy + PID**
- **Run/Stop**
- **Operated on the Panel**
- **Multi-Input**  
**K/J/RTD Selectable**
- **Auto Tuning**  
**Bias Value Settable**
- **Communication**  
**RS-485**
- **Input shift**  
**PV Bias Correctable**

Temperature Controllers	Description	Certification
ITSMT-48R	1/16 DIN Relay-Relay-Relay Controller (100 mm)	CUL-CE
ITSMT-48RM	1/16 DIN Relay-Relay-Relay Controller (100 mm), Manual Output	CUL-CE
ITSMT-48V	1/16 DIN SSR 12 VDC-Relay-Relay Controller (100 mm)	CUL-CE
ITSMT-48VM	1/16 DIN SSR 12 VDC-Relay-Relay Controller (100 mm), Manual Output	CUL-CE
ITSMT-48R -DV	1/16 DIN Relay-Relay-Relay Controller (100 mm), Heating Cooling	CUL-CE
ITSMT-48V-DV	1/16 DIN Relay-Relay-Relay Controller (100 mm), Heating Cooling	CUL-CE
ITSMT-48RM-RS	1/16 DIN Relay-Relay-Relay Controller (100 mm), Manual, RS 485	CUL-CE
ITSMT-48RVM-RS	1/16 DIN SSR 12 VDC-Relay-Relay Controller (100 mm), Manual, RS 485	CUL-CE
ITSMT-48LM-RS	1/16 DIN 4-20 mA-Relay-Relay Controller (100 mm), Manual, RS 485	CUL-CE
ITSMT-48RM-CT	1/16 DIN Relay-Relay-Relay Controller (100 mm), Manual, CT	CUL-CE
ITSMT-48VM-CT	1/16 DIN SSR 12 VDC-Relay-Relay Controller (100 mm), Manual, CT	CUL-CE
ITSMT-48LM-CT	1/16 DIN 4-20 mA-Relay-Relay Controller (100 mm), Manual, CT	CUL-CE
ITSMT-20R	1/8 DIN Relay-Relay-Relay Controller (80 mm)	CUL-CE
ITSMT-20RM	1/8 DIN Relay-Relay-Relay Controller (80 mm), Manual Output	CUL-CE
ITSMT-20V	1/8 DIN SSR 12 VDC-Relay-Relay Controller (80 mm)	CUL-CE
ITSMT-20L	1/8 DIN 4-20 mA-Relay-Relay Controller (80 mm)	CUL-CE
ITSMT-21R	1/8 DIN Horizontal Relay-Relay-Relay Controller (80 mm)	CUL-CE
ITSMT-21V	1/8 DIN Horizontal SSR 12 VDC-Relay-Relay Controller (80 mm)	CUL-CE
ITSMT-96R	1/4 DIN Relay-Relay-Relay Controller (80 mm)	CUL-CE
ITSMT-96V	1/4 DIN SSR 12 VDC-Relay-Relay Controller (80 mm)	CUL-CE
ITSMT-96L	1/4 DIN 4-20 mA-Relay-Relay Controller (80 mm)	CUL-CE



Single Phase Solid State Relays	Description	Certification
---------------------------------	-------------	---------------

**Input Voltage: 3-32VDC**

ISSR-05DD	5 Amp; Operating Voltage: 5-60 VDC
ISSR-10DA	10 Amp Operating Voltage: 24-380 VAC
ISSR25DA	25 Amp Operating Voltage: 24-380 VAC
ISSR-25DA-H	25 Amp Operating Voltage: 90-480 VAC
ISSR-40DA-H	40 Amp Operating Voltage: 90-480 VAC
ISSR-50DA	50 Amp Operating Voltage: 24-380 VAC
ISSR-50DA-H	50 Amp Operating Voltage: 90-480 VAC
ISSR-75DA-H	75 Amp Operating Voltage: 90-480 VAC
IHPR-100DA-H	100 Amp Operating Voltage: 24-550 VAC



45 mm Wide x 60 mm Long x 22.5 mm High

CUR-CE  
 CUR-CE  
 CUR-CE  
 CUR-CE  
 CUR-CE  
 CE  
 CE  
 CE  
 CE

**Input Voltage: 15-60VDC**

ISSR-25AA-L	25 Amp; Operating Voltage: 24-380 VAC
-------------	---------------------------------------

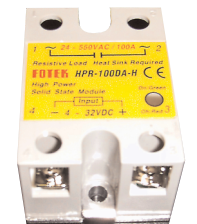
CUR-CE

Single Phase Solid State Relays	Description	Certification
---------------------------------	-------------	---------------

**Input Voltage: 80-250VAC**

ISSR-10AA	10 Amp; Operating Voltage: 24- 380 VAC
ISSR-25AA	25 Amp; Operating Voltage: 24- 380 VAC
ISSR-25AA-H	25 Amp; Operating Voltage: 90-480 VAC
ISSR-40AA-H	40 Amp; Operating Voltage: 90-480 VAC
ISSR-50AA	50 Amp; Operating Voltage: 24-380 VAC
ISSR-50AA-H	50 Amp; Operating Voltage: 90-480 VAC
ISSR-75AA-H	75 Amp; Operating Voltage: 90-480 VAC
IHPR-100AA-H	100 Amp; Operating Voltage: 24-550 VAC

CUR-CE  
 CUR-CE  
 CUR-CE  
 CUR-CE  
 CE  
 CE  
 CE  
 CE



45 mm W x 62 mm L x 31 mm H



### Single Phase Solid State Relays Con't Description Certification

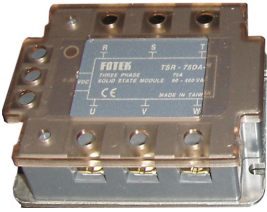
#### Input: 4-20 mA

ISSR-50LA-H	50 Amp; Operating Voltage:250-480 VAC	CE
ISSR-75LA-H	75 Amp; Operating Voltage:250-480 VAC	CE

### Three-Phase Solid State Relays Description Certification

#### Input Voltage: 4-32 VDC

ITSR-25DA-H	25 Amp; Operating Voltage:90- 480 VAC	CE
ITSR-40DA-H	40 Amp; Operating Voltage:90- 480 VAC	CE
ITSR-75DA-H	75 Amp; Operating Voltage:90- 480 VAC	CE
IESR-100DA-H	100 Amp; Operating Voltage:90- 480 VAC	CE



76 mm W x 100 mm L x 30 mm H

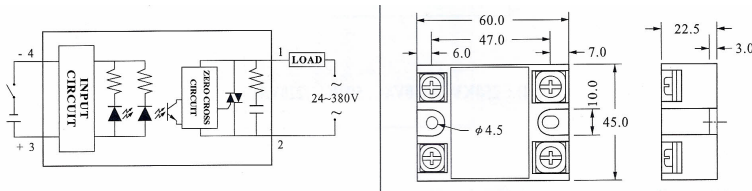
#### Input Voltage: 80-250 VAC

ITSR-25AA-H	25 Amp; Operating Voltage:90- 480 VAC	CE
ITSR-40AA-H	40 Amp; Operating Voltage:90- 480 VAC	CE
ITSR-75AA-H	75 Amp; Operating Voltage:90- 480 VAC	CE
IESR-100AA-H	100 Amp; Operating Voltage:24-550 VAC	CE

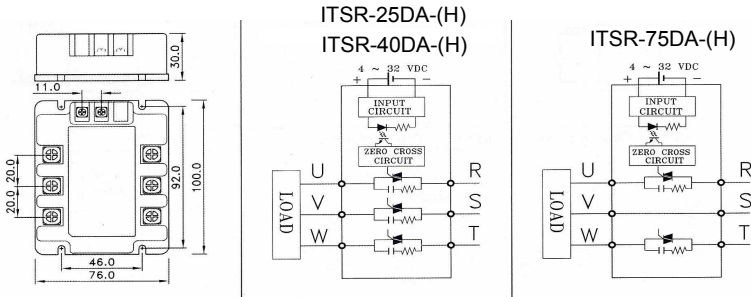
### Solid State Relay Accessories Description

PPC-SSR	Protective Plastic Cover for SSR's (Touch Safe)
IHS-50	1-Phase Heat Sink (3.75"H x 2"W x 4"L)
IHS-150	3-Phase Heat Sink (3.75"H x 6"W x 4"L)
ITSR-100	3-Phase Heat Sink (3.75"H x 4"W x 4"L)
ISF11592A	110 VAC Fan for 3-Phase Heat Sink
ISF23092A	220 VAC Fan for 3-Phase Heat Sink
IHS-4258	Heat Transfer Film (.017"Thick / .45 mm Thick) For 1-Phase Heat Sink
IHS-ESR-100	Heat Sink for IHPR-100DA-H Solid State Relay, (3.25"H x 4"L x 3.75"W)
CF-100DA-H-1	Cooling Fan for IHPR-100DA-H Solid State Relay, 120V, (3.125"x 3.125"x 1" T)
CF-100DA-H-2	Cooling Fan for IHPR-100DA-H Solid State Relay, 240v, (3.125"x 3.125"x 1" T)

ISSR 1-Phase Solid State Relay Wiring Diagram



ITSR 3-Phase Solid State Relay Wiring Diagram



### FUZZY PID CONTROLLER

- **Artificial Intelligence<A> Control**  
Fuzzy PID Control
- **Enhanced Auto-tuning Method**  
At BIAS VALUE SETTABLE
- **Multi-Input Type**  
K/J/RTD (PT) SELECTABLE
- **Alarm Function**
- 15 MODES SELECTABLE
- **RUN/STOP Function**  
OPERATE FROM FRONT PANEL
- **Communication Function**  
RS-485 OPTIONAL



### HOW TO BUILD PART NUMBERS:

**ITSMT - 4896 - R - RS - mA**

1    2    3    4    5

#### 1 SERIES

ITSMT Series Temperature Controller

#### 2 OUTLINE

4896=48<W>x96<H> mmxmm

48=48<W>x48<H> mmxmm

72=72<W>x72<H> mm/mm

96=96<W>x96<H> mmxmm

20=48(W)x96<H> mmxmm

21=96(W)x 48(H) mmxmm

#### 3 OUTPUT METHOD

R=Relay Output

V=Voltage Pulse Output

L=Linear 4-20 mA Output

### TERMINOLOGY:

PV: Process Value Key

SV: Display of the Setting Value

SET: Setting Value Key

Setting Key

Shift and Function Key

Increasing or Autotuning Key

Decreasing and ON/OFF Key

#### 4 OTHER

Non=Standard

RS=RS-485

CT Current Transmitter

S:PV Resender

#### 5 INPUT

NON=K/J/RTD(PT)

MA=MA

V= 0~10V

VR=VARIABLE RESISTANCE



### ■ General Specification & Characteristic

Specification & characteristic	Data	
Power supply	90 ~ 265 VAC 50/60 Hz	
Power consumption	5VA max.	
Sensor input	K / J / PT-100Ω selectable	
Control output	Relay	3A/250VAC SPDT
	Voltage	12V / 50mA
	Linear	4~20 mA ; Load: 600Ω max.
Alarm output	3A/ 250 VAC SPDT	
Control method	Fuzzy + PID or ON / OFF settable	
Operating circumstance	-20°C~+75°C ; 25% ~ 85% RH	
Display accuracy	±0.1% of FS + 1 digit	
Cycle time	0 ~ 99 sec	
Proportional band (P)	0 ~ 999	
integral time (I)	0 ~ 3999	
Derivative time (D)	0 ~ 3999	
Alarm range	-99 ~ 999	
PV sampling time	0.1 sec	
Input shift	-99 ~ +99	
AT bias (TU)	0 ~ 999	
Memory method	EEPROM	
Insulation resistance	Over 50MΩ / 500VDC	
Dielectric strength	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

ALT	Alarm description	ALT	Alarm description	ALT	Alarm description
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 AL2 ON: AL2	8	AL1 ON: (SV-AL1) SV First cycle unable 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

Page 6

## Setting of Parameters

### Default Values











Function	Symbol	Range	Remarks
Control status	1999 1999	1>-999~9999	① CT=0 CT=0 If CT is set to 0, then Control is On/Off
Cycle Time	CT 15	0~99	② Linear Type Disappeared Note: Cycle Time for Logic or SSR Output: 2 Seconds Cycle Time for Relay Output: 15 Seconds
Auto Tunning	At 0	0 or 1	① AT=0 AT=0 Control Status AT=1 AT=1 Autotunning Status
Autotunning Bias	tu 0	0~999	① SV-Tu Autotunning Value=SV-Tu
Proportional Band	°C/°F P 25	0~999	① CT=0 P CT=0 If CT is set to 0 then Control is On/Off
Integral Time	SEC I 150	0~3999	① CT=0 CT=0 If CT is set to 0, then Control is On/Off
Derivative Time	SEC D 41	0~3999	① CT=0 D CT=0 If CT is set to 0 then Control is On/Off
Hysteresis	°C/°F HYS 2	-99~999	① CT=0 CT=0 If CT is set to 0, then set Hysteresis in Degrees
Input Selecting	Ink K	K/J/Pt	① K:0~1372°C ② J:0~1200°C ③ PT:-200~850°C
Unit Selecting	Unit °C	°C/°F	
Decimal Selecting	dp 0	0 or 1	① dp=0 No Decimal Point ② dp=1 One decimal Point
Code	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	bPS 192	96 or 192	① 「96」:9600bps ② 「192」:19200bps
Input Shift	°C/°F Shk 0	-99~999	
Alarm Mode	ALL 0	0~15	① Prefer to the mode of Alarm
Controller No.	Id 00	0~99	① 附RS-485 Communication Type Appeared Only

Start Auto-Tuning; Set At value to 1, Green Light is Turned On Auto-Tuning may take several or longer, depends on heat system.



## ■ Setting of Alarm

Default Values

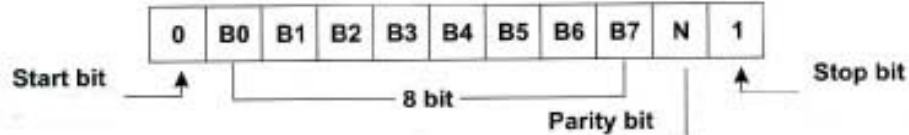
Function	Symbol	Range	Remarks
Control status <i>Press Set Key for 3 Seconds</i>		-999~9999	
Lock setting <i>Press [SET] Key 3 sec</i>		0~3	① 「Lck=0」:Unlock ② 「Lck=1」:SV settable only ③ 「Lck=2」:SV & AL settable only ④ 「Lck=3」:All lock
AL1 alarm setting <i>Press [SET] Key</i>		-999~9999	Deviation Alarm; See Mode of Alarm
AL2 alarm setting <i>Press [SET] Key</i>		-999~9999	Deviation Alarm; See Mode of Alarm ① Refer to mode of alarm
Hysteresis of alarm <i>Press [SET] Key</i>		0~9999	Ex. Alarm mode=「0」 「PV>(SV+AL1)」→AL1 ON 「PV≤(SV+AL1-ALH)」→AL1 OFF
Heater break setting <i>Press [SET] Key</i>		0.0~「CTH」	① 「CT」 Type appeared only ② 「ctu」 < 「HB」 →AL2 ON At heating status
Heating current <i>Press [SET] Key</i>			① 「CT」 Type appeared only
Max. CT value <i>Press [SET] Key</i>		0.0~999.9	① 「CT」 Type appeared only
Limit of setting <i>Press [SET] Key</i>		-999~9999	① SV Setting of High Limit of Range
Limit of output <i>Press [SET] Key</i>		0~100%	① Ton ≤ 「Limit of output」 (Ton=Heating time)

# MT Series PID+Fuzzy Temperature Controller

Page 8

## Setting of Communication

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

NO	Description
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:0000-9999)
09	I:Integral time (Range:0000-3999)
10	D:Derivative 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:Autoturning (Range:-99-0999)
18	ID:Station No (Range:0000-0999)
19	RV:Process Value (Range:-99-3999)
20	LCK:Setting lock (0000 - 0001 - 0002 - 0003)
21	AT:Setting of autoturning (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

CR: Stop code

ID:Station number

R:Read command

W:Write command

Address: Parameter address

Data: Data for reading or writing

FCS: Checking Sum

### Response code:

00:Command completed

01:Address error

02:Data error

03:FCS error

04:Command error



### Cycle Time <CT>

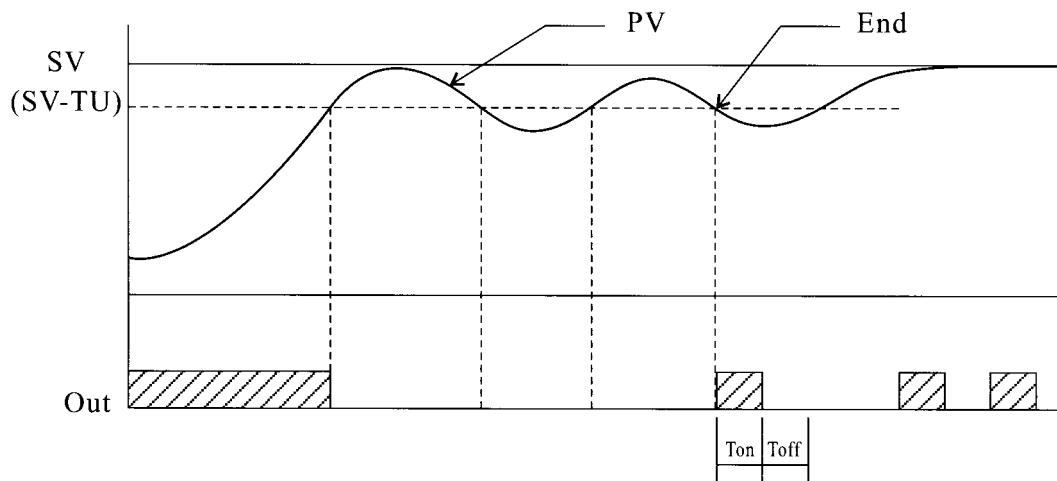
CT (Cycle Time) - Ton (Time On) = Toff (Time Off)

T on - Time of heater ON

T off = Time of heater OFF

### Auto Tuning<AT>

Go to Setting of Parameters on page 6, then change At value to 1, Auto-Tuning is on (Green Light turns on control face)



### Input Shift <SHT>

To correct the difference between the Actual Temperature (SV) and the Process Value (PV)


### PV Resender

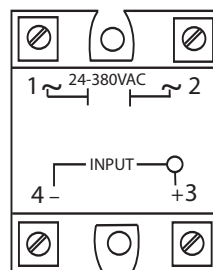
The range of transmitter is set by the SLH. Ex. SLH-200, 0~200 will be transmitted to 4~20mA

### "OFF" Key

To turn OFF all output or Temperature Controller, and only display the value of PV

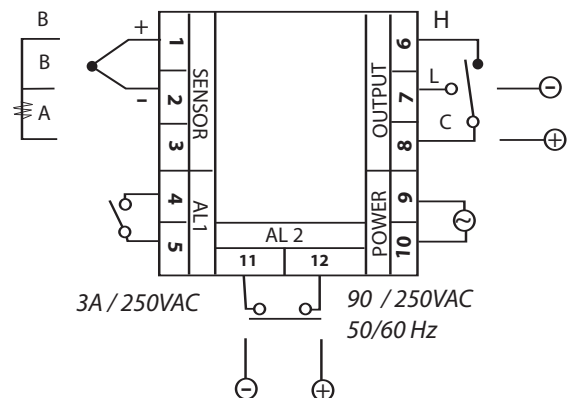
### Auto Tuning Key

If the  key is pressed for 3 seconds, it may enter to the status of Auto Tuning



**SSR-25 DA**  
**25 Amp Solid State Module**

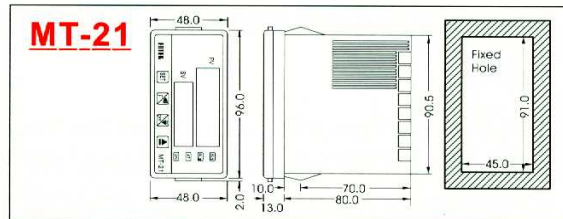
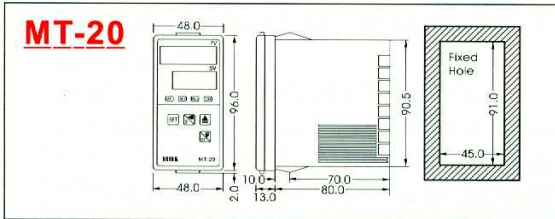
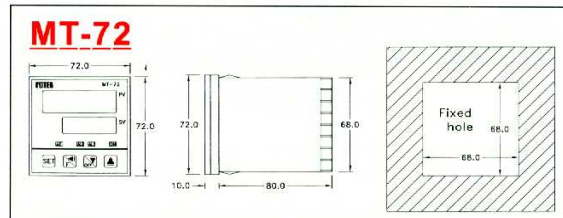
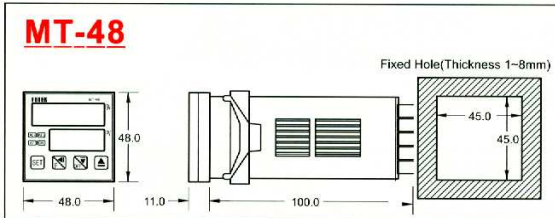
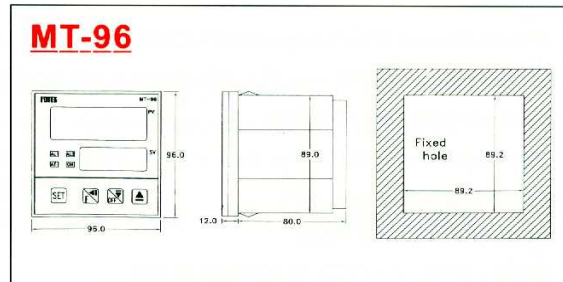
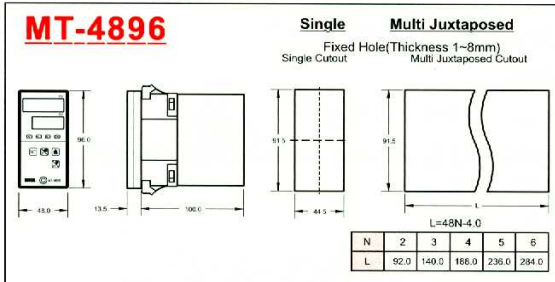
45 mm Wide x 60 mm Long x 22.5 mm High (47 mm MHC)



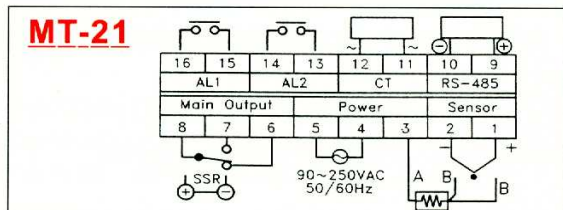
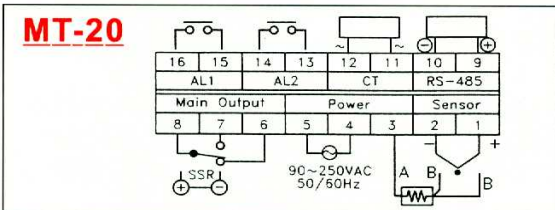
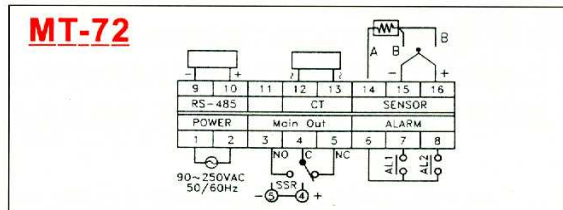
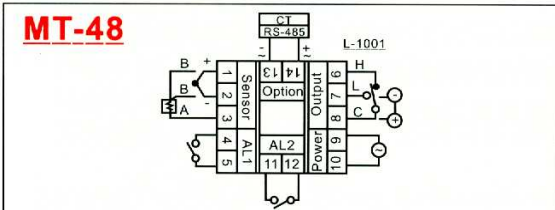
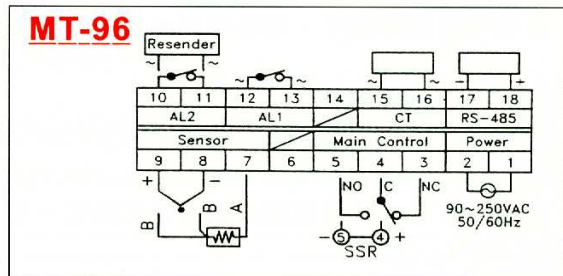
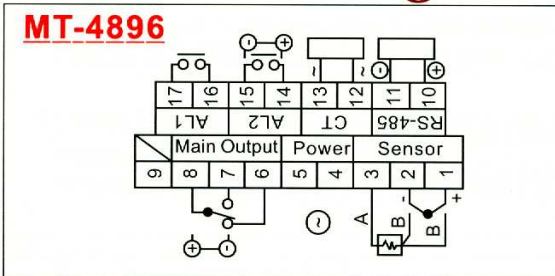
**MT-48V Temperature Control**  
**Wiring Schematic**



## Outline & Fixed Hole



## Connection Diagram





Potentially Hazardous Situation.  
In Case of Mishandling,  
May Result in Death or Serious Injury



Potentially Hazardous Situation.  
In Case of Mishandling,  
May Result in Death or Slight Injury



### WARNING



### CAUTION

1. Please do not touch the Terminals while the power is on. May result in electric shock.
2. Please do not let the metal or wire cuttings drop into the inside of the Temperature Controller. It may result in malfunction or burn out.
3. Be sure to wire the controller correctly before power is turned on. If not, a malfunction or burn out may occur,
4. Do not modify or try to repair controller by yourself. A malfunction or burn out may occur.

1. Be sure to rate the power supply voltage within the specified range, If not, a malfunction or burn out may occur.
2. Be sure to rate the load within the specified value. If not, it may result in a malfunction or burn out.
3. Please install a separate Alarm System to ensure safety protection in the event of a malfunction. If not, a serious accident may occur.

## Notice of Use

1. Install Temperature Controller in an ambient: Temperature;; -20°C ~ +75°C (Without icing or condensation)  
Relative Humidity; 35% ~ 85% RH  
The high ambient temperature may shorten the service life of the Temperature Controller.  
**DO NOT LET IT EXCEED 75°C.**
2. The service life of relays are affected by the switching load. Be sure the switching load is under the rated current.
3. **Thermocouple:** If you need to extend the thermocouple lead wires, be sure to use the compensation wires that match the Thermocouple Type.

**RTD Type:** If it is necessary to extend the RTD sensor lead wires, be sure to use low resistance wires.

4. Be sure to separate the lead wire of the temperature sensor from power lines or high tension lines to avoid noise interruption.
5. It is suggested that you install a separate Alarm System in case the Temperature Controller Alarm may not operate properly when the device is abnormal condition.
6. The Temperature Controller operation may be interrupted by mobile phones or other wireless devices.
7. Outline of Crimp Terminal:



### WARNING

This procedure requires access to the circuitry of a live power unit. Dangerous accidental contact with the line voltage is possible. Only qualified personnel are to perform these procedures. Potentially lethal voltages are present. Experience has proven that many control problems are not caused by a defective instrument. See below for some of the other common causes of failures.

Incorrect parameters entered in menu  
Excessive electrical interference  
Line wires improperly connected  
No voltage between line terminals  
Incorrect voltage between line terminals  
Connections to terminals are open, missing or loose  
Thermocouple (or RTD) is open at tip  
Thermocouple (or RTD) lead is broken  
Shorted thermocouple ( or RTD) leads

Short across terminals  
Open or shorted heater circuit  
Open coil in external contactor  
Burned out line fuses  
Burned out relay inside control  
Defective solid-state relays  
Defective line switches  
Burned out contactor  
Defective circuit breakers

## Trouble Shooting

*If the points listed above have been checked and the controller still does not function, it is suggested that the instrument be returned for inspection. Do not attempt to make repairs. Also, it is advisable to use adequate packing to prevent damage in shipment.*

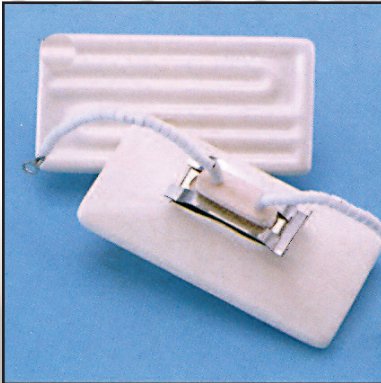




# Infinite Thermal Solutions Inc.

Page 16

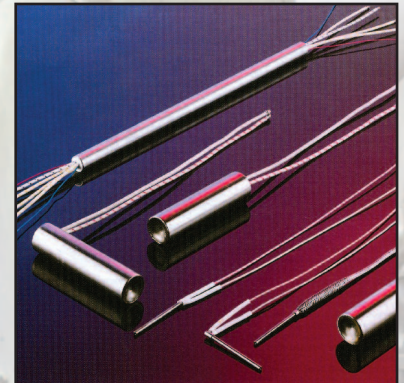
*Exceptional satisfaction through quick response, providing quality solutions for the needs of the customer.*



**Ceramic Heaters**

**CERAMIC INFRARED HEATERS** are high-quality, even heating temperature profiled radiators, with very high temperature surface heating capabilities. Heaters emit medium and long-wave infrared energy of 2-10 $\mu$ . They have long service life due to an embedded, heating resistance coil and can be controlled with an accuracy of 1°C (2°F). Available with and without integrated thermocouples and are available in 4 colors.

**CARTRIDGE HEATERS** are available from 1/8" to 1" diameters and all metric diameters. High-density swaged cartridge heaters can operate in high-temperature applications, and are particularly suited in hot runner systems, packaging jaws, heating dies, molds, and hot melt applications. Swaged cartridge heaters can be profiled for proper heat distribution and can be centerless ground for applications requiring a pressed fit.



**Cartridge Heaters**



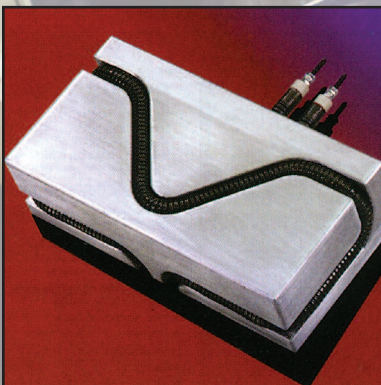
**Band Heaters**

**BAND HEATERS** typify rugged construction, high watt densities and high temperature capabilities that can keep up with increasing machine productivity requirements and the higher processing temperatures necessary in molding engineering resins. The compressed design allows quick transfer of heat from the resistance element for efficient operation.

**HEATED LINES / HOSES** offer a comprehensive line of electrically heated hoses for industrial applications suiting a wide range of applications from gas emission analysis to fluid or semi-fluid materials. These custom designed products provide an application-specific, flexible solution to linking two apparatus together where a rigid line is impossible or impractical.



**Heated Lines / Hoses**



**HotFlex Heaters**

**HOTFLEX TUBULAR HEATERS** are the first tubular heaters in the world which can be manually bent in all three planes. Available in 6.5mm, 8.0mm, and 8.5mm diameters. Improved thermal performance exceeds traditional tubular heaters. To install, simply start in middle of mold heating channel, then tap in with a Teflon or rubber mallet, working your way to each end.

**COIL HEATERS** are the most durable coiled-heater available for the market. Coil heaters are used in many different applications. A few examples are plastic processing, packaging, medical equipment, heated dies, die-casting nozzles, semi-conductor industry, and hot melt applications. When precise temperature and exact heating is needed, the coil heater offers an efficient heating solution for most individual heating requirements.



**Coil Heaters**



*Infinite Thermal Solutions Inc.*