MITSUBISHI

A1S64TCTT-S1 Temperature Control Module
A1S64TCTTBW-S1 Temperature Control Module with Disconnection Detection Function

Mitsubishi General-Purpose Programmable Controller

User's Manual

(Hardware)

Thank you for purchasing the Mitsubishi general-purpose programmable controller MELSEC-A series
Prior to use, please read this manual thoroughly and familiarize yourself with the product

Type	A1S64TCS1-U-E-H/W
Type Code	13J890

IB(NA)-66746-B(9808)MEE

● SAFETY PRECAUTIONS ●

(Please read these precautions prior to use)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual Also, pay careful attention to safety and handle the module properly

These precautions apply only to Mitsubishi equipment Refer to the CPU module user's manual for a description of the PC system safety precautions

These ● SAFETY PRECAUTIONS ● classify the safety precautions into two categories "DANGER" and "CAUTION"

⚠DANGER	Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly
⚠CAUTION	Procedures which may lead to a dangerous condition and cause superficial to medium injury,, or physical damage only, if not carried out properly

Depending on circumstances, procedures indicated by ⚠CAUTION may also be linked to serious results

In any case, it is important to follow the directions for usage

Store this manual in a safe place so that you can take it out and read it whenever necessary Always forward it to the end user

【Design precautions】

⚠ DANGER

- Configure a safety circuit external to the PC, so that the entire system operates safety even if there is an external power error or if the PC is malfunctioning.

⚠CAUTION

- Do not bundle, or near the control cables and communication cables with the main circuit and power cables Keep them at least 100mm (3 94inch) away from such cables Noise may cause erroneous operation.

【Installation precautions】

⚠CAUTION

- Use the PC in the environment given in the general specifications of the this manual Using the PC outside the range of the general specifications may result in electric shock, fire or malfunctioning, or may damage or degrade the module
- Insert the tabs at the bottom of the module into the mounting holes in the base module before installing the module, and after tightening the module fixing screws with specified torque If the connector is not property installed and tightened, it may result in malfunctioning, failure or cause the module to fall out
  Tightening the screws too far may cause damage to the screw and/or the module, resulting in fall out, short circuit or malfunctions
- Do not directly touch the module's conductive parts or electronic components Doing so could cause malfunction or failure in the module
- Insert the wire breakage detection connector installation screw into the mounting holes in the module, and after tightening the connector installation screw with specified toque If the connector is not property installed and tightened, it may result in malfunction, failure, or fall out.

【Wiring precautions】

⚠CAUTION

- Be sure to ground the shield wire with a special PC ground of Type III or above Not doing so could result in malfunction
- When wiring in the PC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or failure
- Tighten the terminal screws with specified torque Loose terminal screws may cause a short circuit, fire, or malfunction
  Tightening the terminal screws too far may cause damage to the screw and/or the module, resulting in fall out, short circuit, or malfunctions
- Be sure that cuttings, wire chips, or other foreign matter do not enter the module Foreign matter may start a fire or cause failure or malfunctions
- Be sure to fix communication cables and power cables leading from the module by placing them in the duct or clamping them Cables not placed in the duct or without clamping may hang or shift, allowing them to be accidentally pulled, which may result in a module malfunction and cable damage
- When detaching the communication cable from the module, do not pull the cable portion For cables with connectors, hold the connector at the junction to the module, then detach it For cables without connectors, first loosen the screw at the junction, then detach the cable Pulling the cable portion while it is connected to the module may cause a malfunction or damage to the module and cable.

【Starting and maintenance precautions】

⚠ DANGER

- Do not touch the terminal while the power is on
  It may cause malfunction
- Make sure to switch all phases of the external power supply off before cleaning or re-tightening the terminal screws If you do not switch off the external power supply, it will cause electric shock
  If the screws are loose, it may result in fallout, short circuits or malfunction
  Tightening the screws too far may cause damage to the screw and/or the module, resulting in fall out, short circuit, or malfunctions.

⚠CAUTION

- Never disassemble or modify the module This may cause failure, malfunctioning, injury and/or fire
- Make sure to switch all phases of the external power supply off before mounting or removing the module If you do not switch off the external power supply, it will cause failure or malfunction of the module.

【Disposal precaution】

⚠CAUTION

- When disposing of this product, handle it as an industrial waste

About the Manuals

The following product manuals are available Please use this table as a reference to request the appropriate manual as necessary

Detailed manual

Manual name	Manual No (Model Code)
A1S64TCTT-S1 Temperature Control Module A1S64TCTTBW-S1 Temperature Control Module with Disconnection Detection Function User's Manual (Detailed edition)	IB-66747 (13J891)

Please read A1S64TCTT-S1 Temperature Control Module A1S64TCTTBW-S1 Temperature Control Module with Disconnection Detection Function User's Manual (Detailed edition) when using this unit.

1. General Description

This user's manual describes the specification, name of each part, wiring, etc of the A1S64TCTT-S1 Temperature Control Module (Hereafter abbreviated as A1S64TCTT-S1) A1S64TCTTBW-S1 Temperature Control Module with Disconnection Detection Function (Hereafter abbreviated as A1S64TCTTBW-S1)
A1S64TCTT-S1 and A1S64TCTTBW-S1 abbreviated as A1S64TC
After unpacking, confirm that there is the following products

Item	A1S64TCTT-S1 Main body	A1S64TCTTBW-S1 Main body
A1S64TCTT-S1	1	—
A1S64TCTTBW-S1	—	1

2. Performance Specification

The A1S64TC performance specification is indicated in Table 2 1

Table 2 1 A1S64TC performance specification

Item		Specification	
		A1S64TCTT-S1	A1S64TCTTBW-S1
Control output value		Transistor output	
Temperature input points		4-channel/module	
Supported thermocouple		Refer to Table 2.2	
Specification accuracy		Ambient temperature 23℃±5℃ (Setting value±0 3%) ±1 digit Ambient temperature 0℃ to 55℃ .(Setting value±0 7%) ±1 digit	
Cool contact temperature compensation accuracy		Within±1 0℃ (0 to 55℃) Within±2 0℃ when the input temperature is in the range -100 to 150℃, within± 3.0℃ when -150 to 250℃	
Sampling cycle		0.5s/4-channel	
Control output cycle		1 to 100 Ω	
Effects of the external resistance		0 35 μ V/Ω	
Input impedance		1M Ω or more	
Input filter		1 to 100S (0. input filter off)	
Sensor compensation value setting		-5 00 to 5 00%	
Operation when there is an input disconnection		Upscale processing	
Temperature control method		PID ON/OFF pulse or 2-position control	
PID constant range	PID constant setting	Auto-tuning setting is possible	
	Proportional region (P)	0 0 to 100 0% (0 0 2-position control)	
	Integral time (I)	1 to 3600s	
	Derivative time (D)	1 to 3600s (Set 0 for PI control)	
Set value range		Within the temperature range set with the thermocouple to be used.	
Blind sector setting range		0.1 to 10.0%	
Transistor output	Output signal	ON/OFF Pulse	
	Rated load voltage	10 2 to 30VDC	
	Maximum load current	0 1A/point 0.4A/common	
	Maximum inrush current	0 4A 10ms	
	Maximum voltage drop when ON	0 1VDC (TYP) 0 1A 2 5VDC (MAX) 0 1A	
	Response time	OFF→ON Less than 2 ms ON→OFF Less than 2ms (resistor load)	

Table 2 1 A1S64TC performance specification (continued)

Item		Specification	
		A1S64TCTT-S1	A1S64TCTTBW-S1
Insulation method		Between the thermocouple input and grounding Transformer insulation Between the thermocouple input and channel Transformer insulation	
Heater disconnection specification	Current sensor	—	URD manufactured current sensor* CTL-12-S36-8 (0 0 to 100 0A) CTL-6-P (0.00 to 20.00A)
	Input method	Multiplexor method A/D conversion	
	Alert delay count	3 to 255	
I/O occupied points		32 points	
Connection terminal		20 points terminal block	
Supported cable size		0.75 to 1.5mm	
Supported solderless terminal		R1.25-3,1.25-YS3,RAV1.25-3,V1.25-YS3A	
Internal consumed current (mA)		330	420
Weight (kg) [lb]		0.27[0.59]	0.3[0.66]
External dimensions (mm) [inch]		130[5 12](H)×34 5[1.36](w)×93.6[3.69](D)	

For the noise resistance, dielectric withstand voltage, and insulation resistance for the PC system which uses this module, refer to the power module specification found in the CPU Module User's Manual

* Only the URD International, Ltd current sensor can be used
Sales channels for current sensors manufactures by URD International Ltd are listed as follows

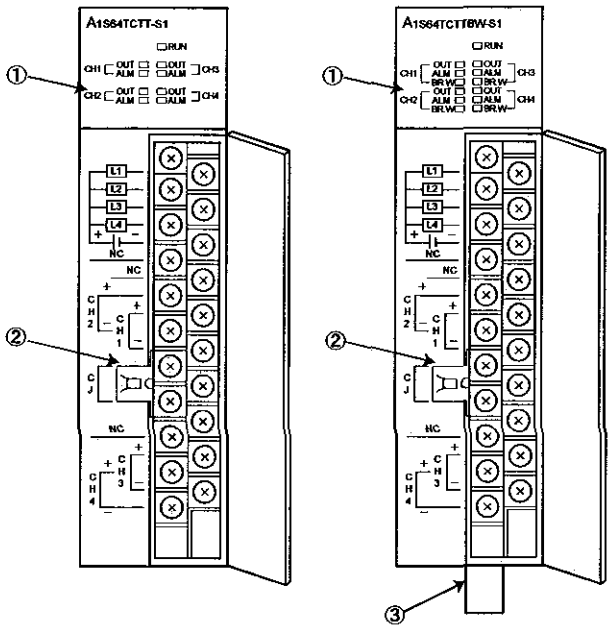
U S A	URD AMERICA Inc Tel 714-831-0111	Hong Kong	GRANDFIT TRADING LIMITED Tel 2782-0254
Brazil	DP GENCO INDUSTRIA E COMERCIO LTDA Tel 011-5584-0959	South Korea	JOYANG TRADING CO Tel 02-831-9596
Germany	ALLIED ELECTRONICS GmbH Tel 0221-497-3084		TWINKLE STAR ELECTRIC CO Tel 02-269-9758
France	DILTRONIC S A Tel 1-34-51-33-00	India	AMTECH ELECTRONICS PVT LTD Tel 02712-25324
Singapore	LEE LABORATORIES PTE LTD Tel 297-2700		

Table 2 2 The types of supported thermocouples and the measured temperature range

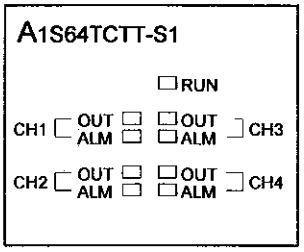
Thermocouple	℃		℉	
	Measured temperature range	Data resolution	Measured temperature range	Data resolution
R	0 to 1700	1	0 to 3000	1
K	0 to 500 0 to 800 0 to 1300	1	0 to 1000 0 to 2400	1
	−200 0 to 400 0 0 0 to 400 0 0 0 to 500 0 0.0 to 800.0	0 1	0 0 to 1000 0	0 1
J	0 to 500 0 to 800 0 to 1200	1	0 to 1000 0 to 1600 0 to 2100	1
	0 0 to 400 0 0 0 to 500 0 0.0 to 800.0	0 1	0 0 to 1000 0	0 1
T	−200 to 400 −200 to 200 0 to 200 0 to 400	1	0 to 700 −300 to 400	1
	−200 0 to 400 0 0.0 to 400.0	0 1	0 0 to 700 0	0 1
S	0 to 1700	1	0 to 3000	1
B	0 to 1800	1	0 to 3000	1
E	0 to 400 0 to 1000	1	0 to 1800	1
	0 0 to 700.0	0.1	—	—
N	0 to 1300	1	0 to 2300	1
U	0 to 400 −200 to 200	1	0 to 700 −300 to 400	1
	0.0 to 600.0	0.1	—	—
L	0 to 400 0 to 900	1	0 to 800 0 to 1600	1
	0 0 to 400 0 0.0 to 900.0	0 1	—	—
PL Ⅱ	0 to 1200	1	0 to 2300	1
W5Re/W26Re	0 to 2300	1	0 to 3000	1

For the general specifications, refer to the User's Manual for the PC CPU used

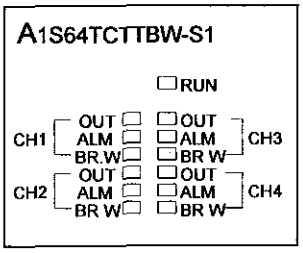
3. Name of Each Part

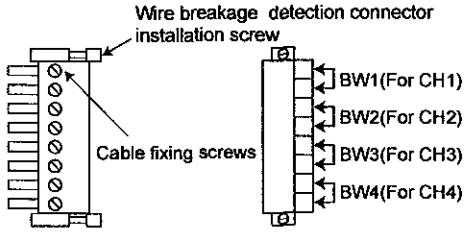


A1S64TCTT-S1 LED



A1S64TCTTBW-S1 LED



Number	Name		Description
①	LED	RUN	A1S64TC operation status display ON Normal operation Flashing (2 sec ON, 2 sec OFF) When write data error occurs Flashing (1 sec ON, 1 sec OFF) Hardware error OFF. 5V power OFF
		OUT	Transistor output status display ON Transistor output ON OFF. Transistor output OFF
		ALM	Alert alarm status display ON The alert alarm is turned ON LAB error occurred Flashing The measured temperature range is exceeded The thermocouple is not connected The thermocouple cable is not connected OFF . The alert alarm is OFF.
		BR W	Heater disconnection detection status display ON The heater disconnection is detected OFF The heater disconnection has not been detected.
②	Cool contact temperature compensation resistor		Shipped pre-installed to the terminal block
③	Disconnection detection connector		Connector to the current sensor 

4. Loading and Installation

Precautions when handling the A1S64TC and installation enviroment are explained
For details of implementing and setting up this unit, please refer to the User's Manual for the PC CPU used

4 1 Handling Instructions

1) The module case is made of plastic Be sure not to drop it or subject it to strong vibration
2) Do not remove the module printed circuit boards from the case It may cause trouble
3) When connecting the wiring, do not allow wire cuttings or other foreign matter to enter from the top of the module Remove any foreign matter from the module
4) Tighten the module installation screws within the following tightening torque range

Screw position	Tightening torque range
Module installation screw (M4 screw)	78 to 118N cm (8 to 12kgf cm) [6.9 to 10.4 lb inch]
Terminal block terminal screw (M3 5 screw)	59 to 88N cm (6 to 9kgf cm) [5.2 to 7.8 lb inch]
Terminal block installation screw (M4 screw)	78 to 118N cm (8 to 12kgf cm) [6.9 to 10.4 lb inch]
Wire breakage detection connector installation screw *(M2.6 screws)	15 to 30N • cm (1 5 to 3 1kgf • cm) [1.3 to 2.7lb • inch]
Cable fixing screw *(M2 screws)	11 to 14N • cm (1 1 to 1 4kgf • cm) [1.0 to 1.2lb • inch]

* Use only for A1S64TCTTBW-S1

4 2 Installations Enviroment

Never install the AnS series PC in the following environments
1) Locations where the ambient temperature is outside the range of 0 to 55℃
2) Locations where the ambient humidity is outside the range of 10 to 90%RH
3) Locations where dew condensation takes place due to sudden temperature changes
4) Locations where there are corrosive and/or combustible gasses
5) Locations where there is a high level of conductive power (such as dust and iron filings, oil mist, salt, and organic solvents)
6) Locations exposed to the direct rays of the sun
7) Locations where strong power and magnetic fields are generated
8) Locations where vibration and shock are directly transmitted to the main module

5. Wiring

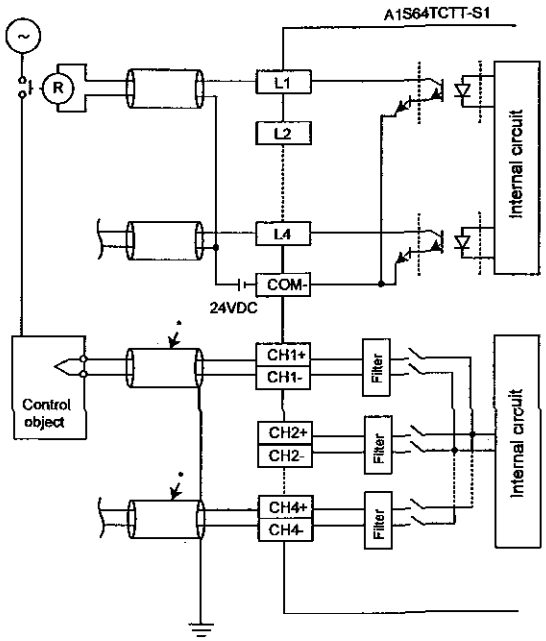
The precaution when wiring and the module connection example are shown below

5 1 Precaution when wiring

In order to have the best result from the A1S64TC functions and to make the system highly reliable, an external cabling with low noise effects are necessary
The external wiring precautions are shown below
1) Use separate cables for the alternating current and A1S64TC external input signals to avoid A/C surges and induction effects
2) Do not bunch the cables with the main circuit, high-voltage cable or load cables from other than PC, or install them close to each other
   Install the thermocouple at least 10 cm away from the main circuit line or alternating current control circuit
   Install the cables far apart from high-frequency circuits, such as the high-voltage cable and inverter load main circuit, as much as possible
   This increases the noises, surges, and induction
3) Perform a one-point grounding for the shielded line and shields of the seal and cable at the PC However, there may be cases when grounding should be performed externally depending on the noise condition

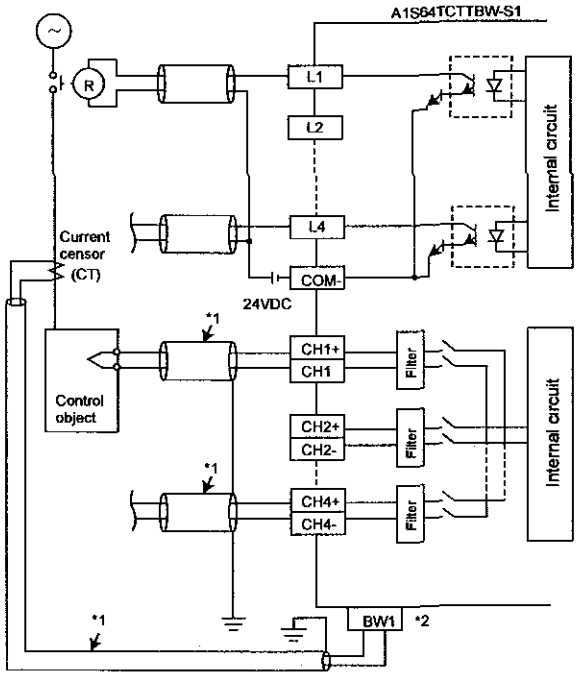
5 2 Module wiring example

1) A1S64TCTT-S1



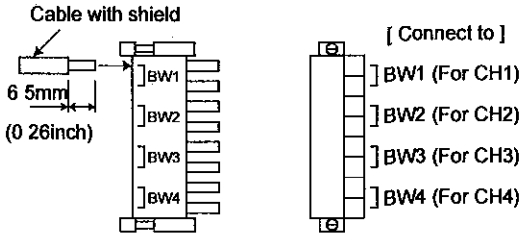
* Always use the shielded compensating conductor for the cable

2) A1S64TCTTBW-S1



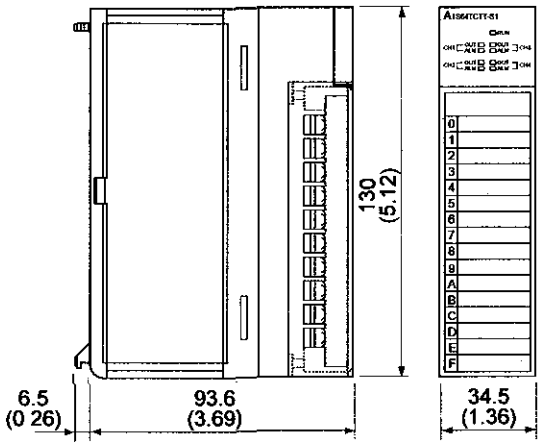
*1 Always use the shielded compensating conductor for the cable

*2 Refer to the following for the connection of the disconnection detector connector

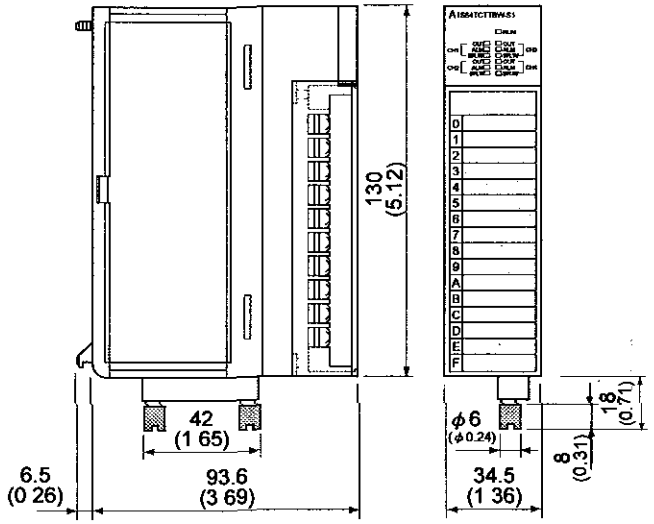


6. External Dimensions

1) A1S64TCTT-S1



2) A1S64TCTTBW-S1



Unit mm(inch)

The United States	Mitsubishi Electronics America, Inc , (Industrial Automation Division) 800 Biemann Court Mt Prospect IL 60056 Phone : (708) 298-9223
Canada	Mitsubishi Electric Sales Canada Inc (Industrial Automation Division) 4299 14th Avenue, Markham, Ontario L3R OJ2 Phone : (416) 475-7728
United Kingdom	Mitsubishi Electric UK Ltd , (Industrial Sales Division) Travellers Lane Hatfield Herts , AL10 8XB Phone : (0707) 276100
Germany	Mitsubishi Electric Europe GmbH (Industrial Automation Division) Gothaer Strasse 8 Postfach 1548 D-4030 Ratingen 1 Phone : (02102) 4860
Taiwan	Setsuyo Enterprise Co , Ltd (106) 11th Fl Chung-Ling Bldg , 363 Sec 2 Fu-Hsing S Rd , Taipei Taiwan R O C Phone : (02) 732 0161
Hongkong (& China)	Ryoden International Ltd , (Industrial & Electrical Controls Division) 10/F , Manulife Tower 169 Electric Rd , North Point, Hong Kong Phone : 8878870
Singapore (& Malaysia)	MELCO Sales Singapore Pte Ltd (Industrial Division) 307 Alexandra Rd #05-01/02, Mitsubishi Electric Bldg , Singapore 0315 Phone : 4732308
Thailand	F A Tech Co , Ltd , 1138/33-34 Rama 3 Rd , Yannawa Bangkok 10120 Phone : (02) 295 2861 4
Australia	Mitsubishi Electric Australia Pty Ltd (Industrial Controls Division) 348 Victoria Rd Rydalm ere N S W 2116 Phone : (02) 684 7200
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