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MITSUBISHI

Pt100 Input Module

User's Manual

(Hardware)

A1S62RD3/4

Thank you for buying the Mitsubishi general-purpose programmable logic controller MELSEC-A Series

Prior to use, please read both this manual and detailed manual thoroughly and familiarize yourself with the product

MODEL	A1S62RD3/4(H/W)-U-E
MODEL CODE	13JE44
IB(NA)-66483-B(0002)MEE	

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● SAFETY PRECAUTIONS ●

(Read these precautions before using)

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

⚠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 superfical to medium injuly, or physical damage only If not carried out properly

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

In many 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

[SYSTEM DESIGN PRECAUTIONS]

⚠CAUTION

- Do not bundle control lines or communication wires together with main circuit or power lines, or lay them close to these lines
  As a guide, separate the lines by a distance of at least 100mm, otherwise malfunctions may occur due to noise.

[CAUTIONS ON MOUNTING]

⚠CAUTION

- Use the PC in an environment that conforms to the general specifications in the manual
  Using the PC in environments outside the ranges stated in the general specifications will cause electric shock, fire, malfunction, or damage to/deterioration of the product
- Install so that the pegs on the bottom of the unit fit securely into the base unit peg holes
  Not installing the unit correctly could result in erroneous operation, damage, or pieces of the product falling.

[CAUTIONS ON WIRING]

⚠CAUTION

- Be sure to ground the FG and LG terminals, carrying out at least class 3 grounding work with a ground exclusive to the PC
  Otherwise there will be a danger of electric shock and malfunctions
- Carry out wiring to the PC correctly, checking the rated voltage and terminal arrangement of the product
  Using a power supply that does not conform to the rated voltage, or carrying out wiring incorrectly, will cause fire or failure
- Tighten the terminal screws to the stipulated torque
  Loose screws will cause short circuits, fire, or malfunctions
- Make sure that no foreign matter such as chips or wiring offcuts gets inside the module. It will cause fire, failure or malfunction.

[CAURIONS ON STARTUP AND MAINTENANCE]

⚠DANGER

- Do not touch terminals while the power is ON
  This will cause malfunctions
- Switch the power off externally for all phases before cleaning or re-tightening terminal screws, otherwise you may sustain electric shock.

⚠CAUTION

- Do not disassemble or modify any module
  This will cause failure, malfuntion, injuries, or fire,
- Turn the power off when removing a unit Trying to remove the unit while the power is on could damage the unit or result in erroneous operation.

[CAURIONS ON DISPOSAL]

⚠CAUTION

- Dispose of this product as 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)
Pt100 input module type A1S62RD3/4 User's Manual	IB-66338 (13J675)

1. Overview

This manual describes the specifications and names of the parts of the platinum resistance bulb Pt100 temperature input module A1S62RD3 and platinum resistance bulb Pt100 temperature input module A1S62RD4 (hereinafter, A1S62RD3/4) used with the MELSEC-A Series PLC CPU

2. Performance Specifications

2 1 Performance specifications

The performance specifications of the A1S62RD3/4 are shown below.

Item	A1S62RD3	A1S62RD4
Measurement method	3 wire type	4-wire type
Connectable resistance bulb	Pt100 (JIS C1604-1989, DIN 43760 1980 compatible)	
	JPt100 (JIS C1604 1989 compatible)	
Temperature detection output current	4.2mA (MIN.) 4.7mA (MAX.)	
Temperature input range	Pt100: 180[°C] to +600[°C] (27.08Ω to 313.59Ω)	
	JPt100:-180[°C] to +600[°C] (25.8Ω to 317.28Ω)	
Temperature detection value	16-bit signed binary: -1800 to +6000 (value to first decimal digit x 10 fold)	
	32 bit signed binary: -180000 to +600000 (value to third decimal digit x 1000-fold)	
Resolution	0.025°C	
General precision	±1% (precision in respect to full scale)	
Conversion speed	40ms/channel	
No. of temperature input points	2 channels/module	
Insulation method	Between channels: Not insulated Between input terminal and PLC power supply: Photo coupler insulation	
No. of occupied input/output points	32 points	
Connected terminal block	20-point terminal block	
Applicable wire size	0.75 to 1.5mm^2	
Cable between A1S62RD and Pt100	Refer to section 2.2	
Applicable crimp terminal	V1.25-3, V1.25-YS3A, V2-S3, V2 YS3A	
Internal current consumption (5VDC)	0.54A	0.44A
Weight	0.29kg	0.28kg

Refer to the PLC CPU User's Manual for the general specifications

2 2 Specifications when platinum resistance bulb is connected

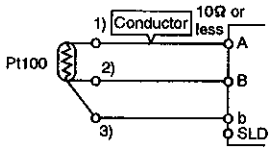
The specifications for connecting the A1S62RD3/4 with the platinum resistance bulb are explained below

1) For A1S62RD3

Make sure that the conductor resistance value between the Pt100 and A1S62RD3 is 10 [Ω] or less per wire

All channels between CH 1 and CH 2 have the same specifications

CH 1 to CH 2

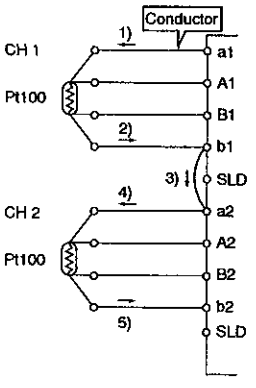


Wire so that the following is satisfied:
1) Conductor resistance value ≦10 (Ω)
2) Conductor resistance value ≦10 (Ω)
3) Conductor resistance value ≦10 (Ω)

2) For A1S62RD4

Make sure that the total resistance value of the conductors over which the current passes is 70 [Ω] or less

[Example] To connect Pt100 to both CH 1 and CH 2



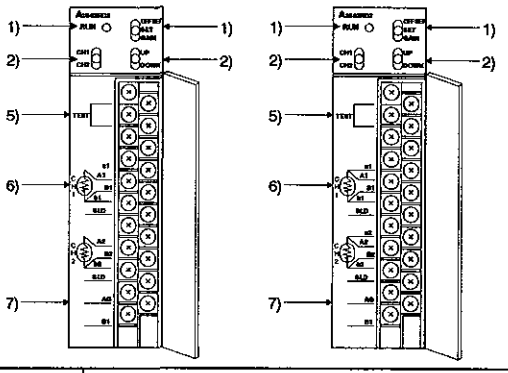
Wire so that 1) + 2) + 3) + 4) + 5) ≦70 (Ω)

The arrow ← indicates the current flow

3. Names of Each Part and Settings

3 1 Names of each part

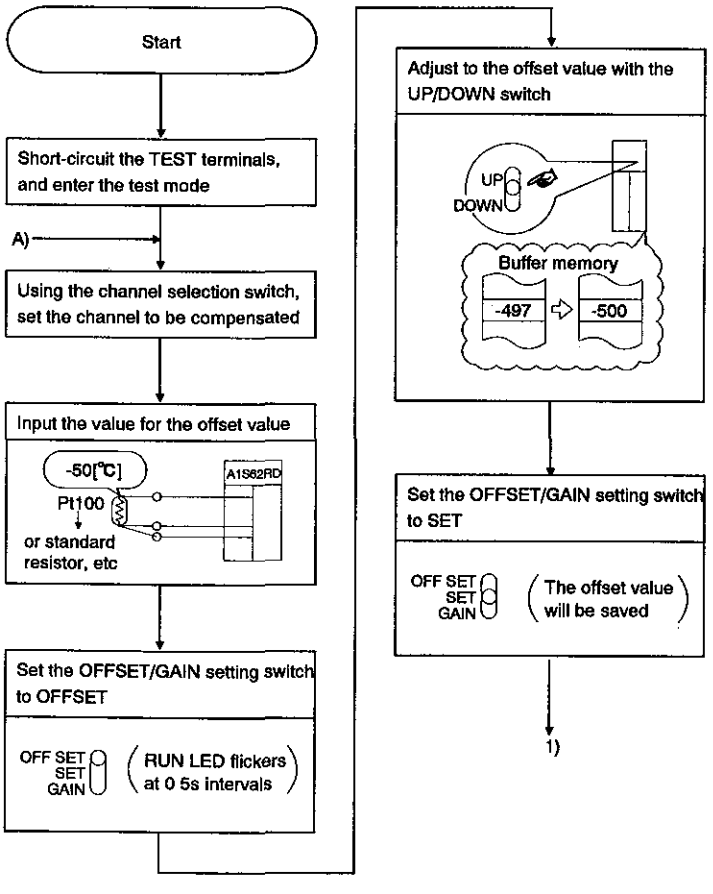
The names of each part of the A1S62RD3/4 are explained below

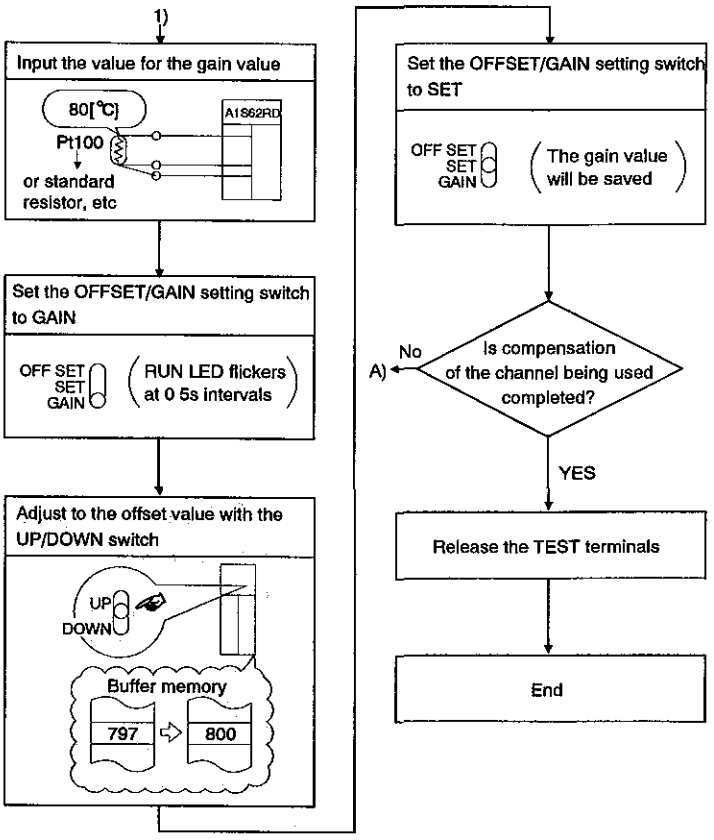


No.	Name	Details	
1)	Operation status display LED (RUN LED)	Normal mode	ON : In normal operation ON : Write data error occurring OFF : 5VDC power OFF or watch dog timer error occurring
		Test mode	Flicker : When the OFFSET/GAIN setting switch is set to OFFSET or GAIN, the LED will flicker at 0 5 second intervals OFF : OFFSET/GAIN setting switch set to SET.
2)	Channel selection switch	Selects the channel for adjusting the offset and gain for error compensation.	
3)	OFFSET/GAIN setting switch	Sets the offset value and gain value for the test mode 1) OFFSET position : Offset value compensation mode 2) GAIN position : Gain value compensation mode 3) SET position : Offset value/gain value save mode The temperature detection value at the time the switch is changed from the OFFSET/GAIN position to the SET position is saved in the A1S62RD3/4 internal memory as the offset/gain value.	
4)	UP/DOWN switch	Increments/decrements the offset value/gain value for the channel being used at the following rate 1) ON for less than 1 5 seconds: Increments/decrements in 0 025-C units 2) ON for 1 5 seconds or more: Increments/decrements in 0 1-C unit every 0.04 seconds.	
5)	Test mode terminal	Short-circuit across terminals 1 and 3 to carry out error compensation.	
6)	Pt100 connection terminal	Connect the Pt100 (Refer to section 5)	
7)	Analog/ground terminal	Use to provide a separate ground	

3 2 Error compensation procedures

The flow for error compensation is shown below





POINT

1) Once the offset/gain is set with the test mode, the offset value cannot be checked by setting the OFFSET/GAIN setting switch to OFFSET again (The setting value is held)
2) If the device is used in the normal mode after the offset/gain is set with the test mode, the previously set offset value and gain value cannot be confirmed by entering the test mode. (The setting value is held.)

4. Handling

4 1 Precautions for handling

1) The main case and terminal block are made of resin, so do not drop it or apply strong impacts
2) Do not remove the module's PCB from the case Failure to observe this could lead to faults
3) Make sure that foreign matter, such as wire scraps, do not enter the module during wiring Remove any foreign matter that enters
4) Tighten the module installation screws and terminal screws within the following ranges

Screw position	Tightening torque range
Module installation screw (M4 screw)	78 to 118N•cm {8 to 12kg•cm}
Terminal block installation screw (M3.5 screw)	59 to 88N•cm {6 to 9kg•cm}
Terminal block terminal screw (M4 screw)	78 to 118N•cm {8 to 12kg•cm}

5. Wiring

Precautions for connecting the Pt100 to the A1S62RD3/4, and the connection methods are described below

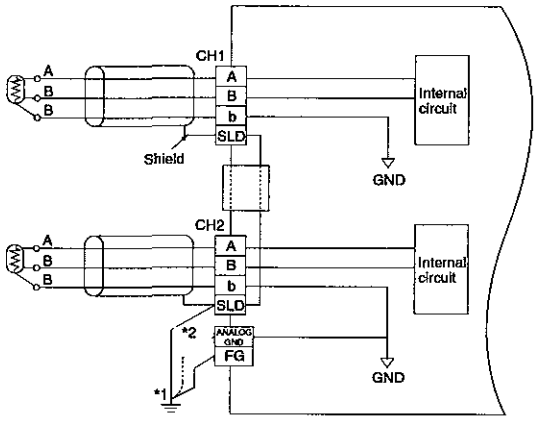
5 1 Precautions for connecting

As a condition to use the A1S62RD functions to the fullest and create a highly reliable system, external wiring that is not susceptible to noise is required
The precautions for external wiring are shown below

1) Use separate cables for the AC and A1S62RD external input signal, and make sure that the cable is not affected by the AC side surge or inductance
2) Do not lay the cables near or with the main circuit wires, high-voltage wires or load wires other than those from the PLC Failure to observe this will increase the effect of noise, surge and inductance
3) Ground the shield wire or shield clamp shield to one point on the PLC side Note that in some cases, grounding these at an external source may be preferable depending on the state of the external noise

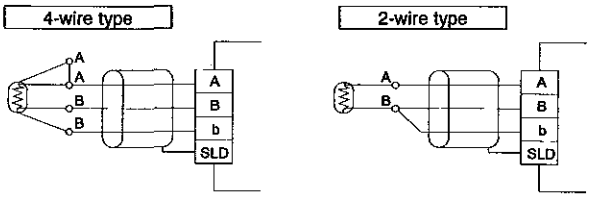
5 2 Connection to A1S62RD3

1) The highest precision can be achieved by connecting a 3-wire type Pt100 to the A1S62RD3 An example of connecting a 3-wire Pt100 is shown below



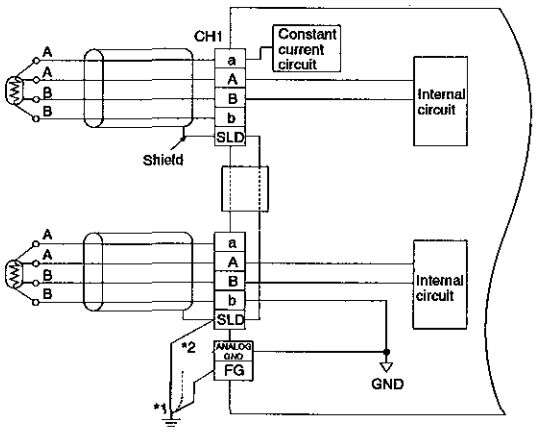
*1 Also ground the power supply unit's FG
*2 It may be preferable to connect this depending on the working environment

2) A 4-wire type or 2-wire type Pt100 can also be used with the A1S62RD3
Connect as shown below when connecting a 4-wire type or 2-wire type Pt100



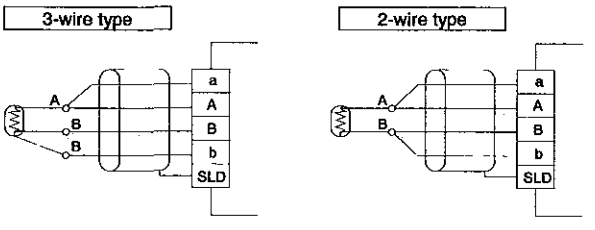
5 3 Connection to A1S62RD4 and precautions

1) The highest precision can be achieved by connecting a 4-wire type Pt100 to the A1S62RD4
An example of connecting a 4-wire Pt100 is shown below



*1 Also ground the power supply unit's FG
*2 It may be preferable to connect this depending on the working environment

2) A 3-wire type or 2-wire type Pt100 can also be used with the A1S62RD4
Connect as shown below when connecting a 3-wire type or 2-wire type Pt100



Precautions for connecting to A1S62RD4

Important

1) Connect so that there is continuity between the A1S62RD4 terminals a1 and b2 (Refer to Fig 1)
2) Skip the terminals of the channel not being used when connecting (Refer to Fig 2)

Using all channels

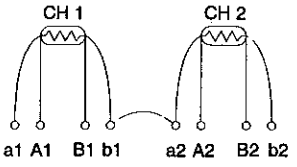


Fig. 1

Using only CH.1

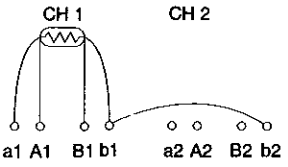


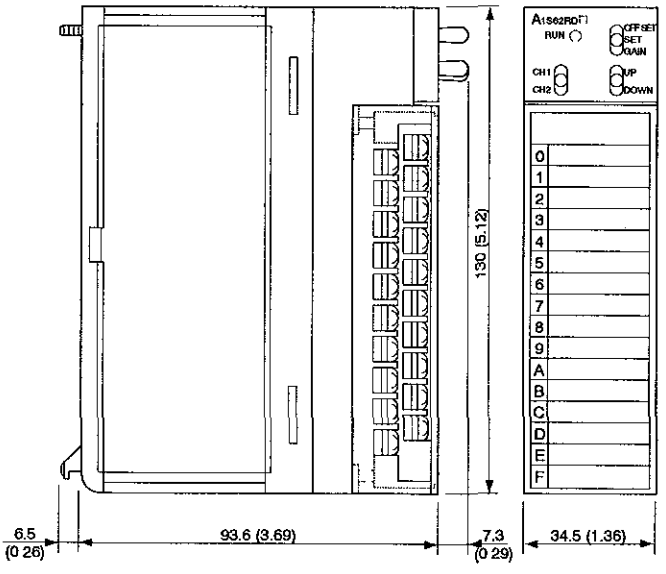
Fig. 2

Point

Always designate the channel to which the Pt100 is not connected as "Conversion Prohibited"
When the channel to which the Pt100 is not connected are designated as "Conversion Enabled", the disconnection detection flag turns ON even if the channel to which the Pt100 is connected is not disconnected.

6. Outline Dimension Drawing

A1S62RD4



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⚠For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi
- This product has been manufactured under strict quality control However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system

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