

MITSUBISHI

PROGRAMMABLE CONTROLLER

MELSEC-A

User's Manual

PC fault detection module type AS91, A1SS91, A0J2-S91 (Hardware)

INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC A Series of General Purpose Programmable Controllers. Please read this manual carefully so that the equipment is used to its optimum. A copy of this manual should be forwarded to the end user.



IB (NA) 66594-A

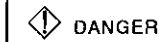
Cautions on Safety

(Please read before using the module)

Please carefully read this manual and related ones mentioned herein to ensure safety and operate this module properly.

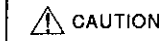
The following cautions are applicable only to the module. For the cautions on safety relating to the PC CPU system, see the PC CPU User's Manual.

The cautions in this manual on safety are classified into two ranks, "DANGER" and "CAUTION", according to their importance.



DANGER

A warning given when improper operation could result in a dangerous situation causing death or serious injuries.



CAUTION

A caution given when improper operation could result in a dangerous situation causing moderate or injuries, and physical damage to the module, etc.

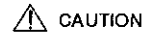
Even failure to observe a caution marked CAUTION may bring about a serious accident depending on the situation. Do not fail to follow the cautions. Retain this manual for consultation whenever necessary, and provide a copy to the end user.

Cautions on Design



DANGER

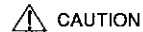
- Provide safety circuits external to the PC to ensure that the system as a whole can continue to operate safely even if there is a fault in the external power supply or in the PC itself. Otherwise, accidents could occur as a result of erroneous outputs and malfunctions.
- The PC fault detection module serves only to detect faults of the PC CPU and bus; it cannot prevent mechanical problems. Configure circuits such as emergency stop circuits, protective circuits, interlock circuits for mutually exclusive operations (e.g. forward/reverse), and interlock circuits to prevent machine breakage such as those for upper and lower limits external to the PC.



CAUTION

- Do not bundle the control wire with the main circuit or power line or keep them close to one another. Keep the control wire and the communication cable at least 100 mm away from the main circuit or power line; otherwise, noise or malfunctions will occur.

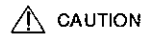
Cautions on Installation



CAUTION

- Use the PC in the environment specified in the General Specifications section in this manual. Using it in an environment which does not meet the general specifications could cause electric shock, fire or malfunctions, and damage or deterioration of the module.
- Install the module by engaging the module mounting projections on the lower part of the module in the mounting holes of the base unit. Incorrect installation could result in malfunctions, failure of detachment.
- Check that the extension cable is correctly engaged with the module's connector, and firmly secured. If it is not correctly engaged, erroneous inputs and outputs could occur.

Cautions on Wiring



CAUTION

- Carry out wiring to the module correctly, checking the terminal arrangement.
- Take all possible measures to prevent chips or wire scraps from entering the module. Entry of foreign material will cause fire, failure of malfunctions.
- Tighten the terminal screws to the special torque. Loose terminal screws will cause a short, fire or malfunctions.

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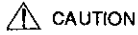
Specifications subject to change without notice.

Cautions on Start-Up and Maintenance



DANGER

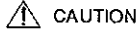
- Do not touch the terminals while they are live. You could receive an electric shock or cause malfunctions.
- Switch the power off before cleaning the module. If the power is left on, the module will break down or malfunction.



CAUTION

- Do not disassemble or tamper with the module. This will cause failure, malfunctions, injuries or fire.
- Switch the power off before installing or removing the module. If the power is left on, the module will break down or malfunction.

Caution on Disposal



CAUTION

- Dispose of the module as industrial waste.

1. GENERAL DESCRIPTION

1 GENERAL DESCRIPTION

This manual describes the specifications and part nomenclature of the AS91, A1SS91, A0J2-S91 PC fault detection module, which are intended for use in combination with MELSEC-A series PC CPUs.

(1) Applicable CPU modules, and number of loadable modules

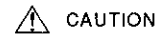
Applicable CPU Models	Usable PC fault detection modules	Remarks
A1(N)CPU A2(N)CPU A2NCP S1 A3(N)CPU A3HCPU A3MCP A2ACPU A2ACPU S1 A3ACPU A2UCPU A2UCPU-S1 A3UCPU A4UCPU A3VCP Q2ACPU Q2ACPU S1 Q3ACPU Q4ACPU	AS91 A0J2-S91	<ul style="list-style-type: none"> • Only 1 of these modules can be installed with one CPU
A1SJC A1SCP A1SCP S1 A2SCP A2SCP S1 A2ASCP A2ASCP S1/S30	AS91 A1SS91 A0J2 S91	
A0J2CPU A0J2HCP	A0J2 S91 AS91	

(2) Module loading position

Load an AS91/A1SS91 at the final slot number in the range for modules actually used (I/O modules, special function modules), or a later slot.

Set the I/O module number for an A0J2-S91 as the final number for actually used units plus one, or higher.

If there are any actually used modules at slots later than the one in which the fault detection module is loaded, it will not be possible to detect faults at them.



CAUTION

- If the PC fault detection module is installed in a slot following an active module subject to restrictions (must be installed in the last slot, cannot be installed next to a relay output module, etc.), a vacant slot should be left between the PC fault detection module and that module, or the number of extension stages should be changed.

1.1 Related Manuals

AS91, A1SS91, A0J2-S91 User's Manual (IB-66626)
Gives details of the specifications, functions and programming of the AS91, A1SS91, A0J2 S91

2. PERFORMANCE SPECIFICATIONS

2 PERFORMANCE SPECIFICATIONS

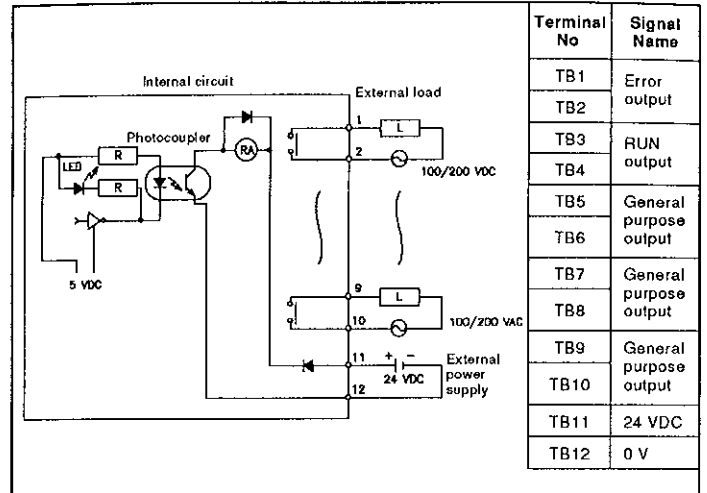
Item	Performance/Spec		
	AS91	A1SS91	A0J2-S91
Output format	Contact output		
RUN output contact	1 point (ON at RUN)		
Error output contact	1 point (OFF when normal, ON at error)		
General purpose output points	3 points (switched ON/OFF by program)		
Isolation method	By photocoupler		
Rated switching voltage & current	24 VDC 2 A (resistance load) 240 VAC 2 A (COS ϕ = 1) / 1 point 5 A/all points		
Minimum switching load	5 VDC 1 mA		
Maximum switching voltage	264 VAC 125 VDC		
Response time	OFF→ON	10 ms or less	
	ON→OFF	12 ms or less	
Life	Mechanical	20,000 000 times or more	
	Electrical	100,000 times or more at rated switching voltage & current load	
		100,000 times or more at 200 VAC 1.5 A, 240 VAC 1 A (COS ϕ = 0.7)	
		100,000 times or more at 200 VAC 0.75 A, 240 VAC 0.5 A (COS ϕ = 0.35)	
		100,000 times or more at 24 VDC 1A, 100 VDC 0.1 A (L/R = 7 ms)	
Maximum switching frequency	3600 times per hour		
Surge suppressor	None		
Common method	No common (all points individual contact)		
Operation display	ON indicator (LED)		
External power supply	Voltage	24 VDC \pm 10 %, ripple voltage of 4 Vp p or less	
	Current	30 mA (TYP 24 VDC all points ON)	
Internal current consumption (5 VDC)	80 mA	80 mA	90 mA
Number of occupied points	16 points (I/O allocation: 16 output points)	16 points (I/O allocation: 16 output points)	64 points (I/O allocation: 64 output points)
External cable connection format	12 point terminal board connector	13 point terminal board connector	
Power cable size	0.75 to 2mm ² (tightening torque 68.6 N cm (7 kg cm) [60.4 lb inch])		
Applicable solderless terminals	1 2S 3 1 2S YS3A 2 S3 2 YS3A V1 2S 3 V1 2S YS3A V2 S3 V2 YS3A		
Weight kg (lb)	0.410 (0.902)	0.225 (0.495)	0.580 (1.276)
Noise resistance	By noise simulator 1500 V P P noise voltage 1 μ s noise width and 25 to 60 Hz noise frequency		
Dielectric withstand voltage	1500 VAC for 1 minute across AC external terminals and ground 500 VAC for 1 minute across DC external terminals and ground		
Insulation resistance	10 M Ω or greater measured with a 500 VDC insulation resistance tester across AC external terminals and ground		

For the general specifications refer to the User's Manual for the PC CPU you are using

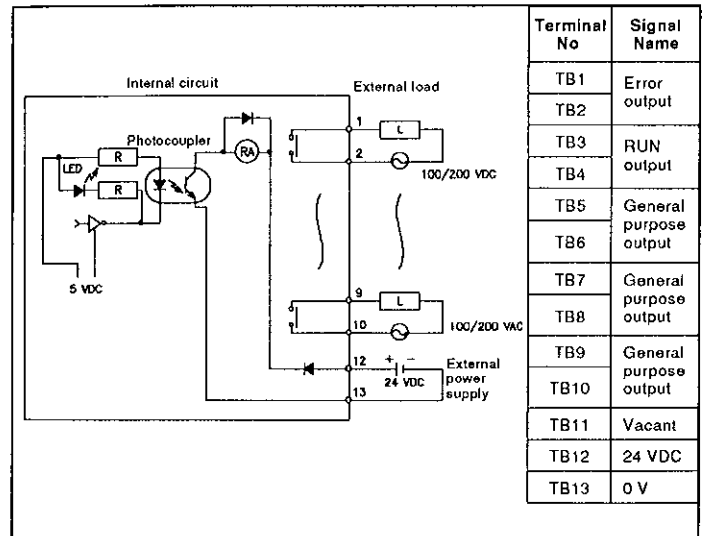
3. EXTERNAL CONNECTIONS

3 EXTERNAL CONNECTIONS

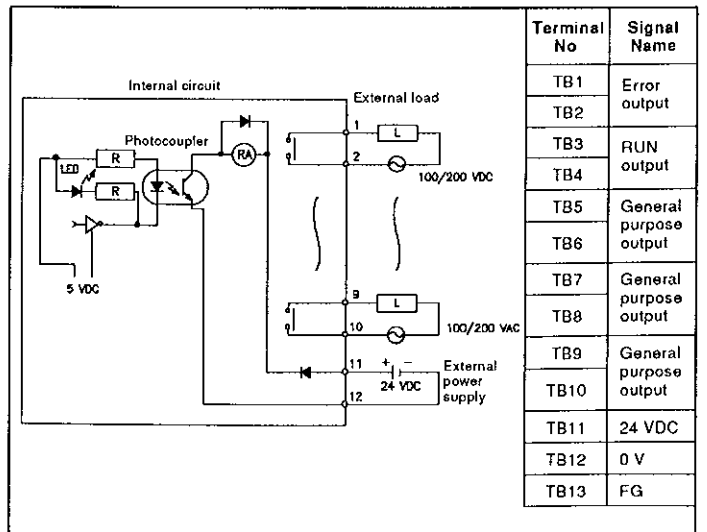
(1) AS91



(2) A1SS91

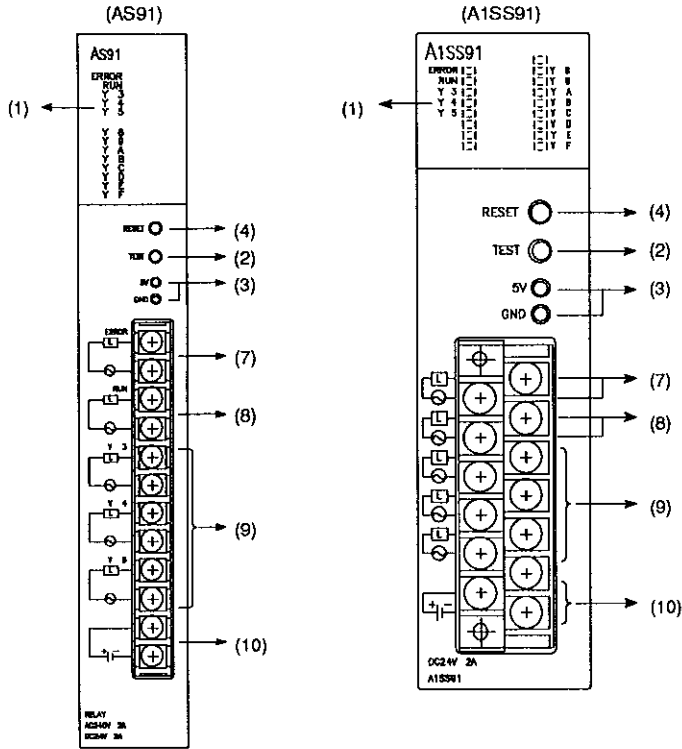


(3) A0J2-S91

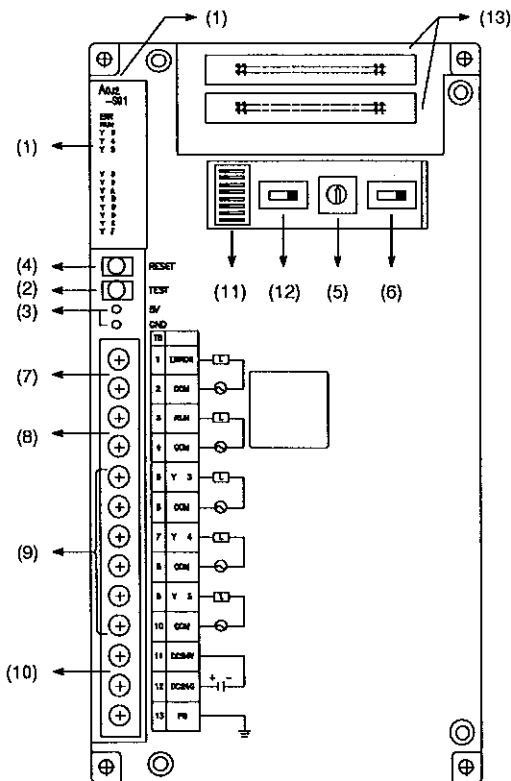


4. NOMENCLATURE AND SETTINGS

4 NOMENCLATURE AND SETTINGS



(A0J2-S91)



No	Name	Explanation		
		Normal	Error	
	Pattern A		Pattern B	
(1)	Output LED, error LED	CPU RUN status	ERR LED : OFF RUN LED : ON Y3 to Y5 : OFF Y8 to YF : Flicker	ERR LED : ON RUN LED : OFF Y3 to Y5 : OFF Y8 to YF : Varies
		CPU STOP status	ERR LED : OFF RUN LED : OFF Y3 to Y5 : OFF Y8 to YF : OFF	
(2)	Test switch	Switch is pressed continuously for self loopback test		
(3)	5 V check terminal	Test terminal for measuring internal 5 V power supply by tester		
(4)	Reset switch	Resets (cancels) an error output without switching the CPU power OFF		
(5)	Rotary switch *	For this module, must be designated at the final station number		
(6)	5 V supply line switching SW *	For A0J2 systems, set to CPU5V or EX5V depending on the A0J2 system configuration For "A", "A1S" base unit systems set to EX5V		
(7)	Error output terminal	Output when a bus error is detected		
(8)	RUN output terminal	Output at CPU RUN and PAUSE statuses (Forced OFF when bus error occurs)		
(9)	General purpose output terminal	Output when general purpose outputs are used (Forced OFF when bus error occurs)		
(10)	External power supply terminal	Supplies 24 VDC from an external source		
(11)	"Number of extension stages" setting switch *	Designates the number of extension stages for "A" base → A0J2-S91 systems		
(12)	"A base → A0J2 S91 switching switch *	Used for switching in systems configured with A0J2 units, and in "A" base → A0J2-S91 systems		
(13)	Extension cable connector *	Connector for cable which connects units in systems consisting of A0J2 units		

*: Applies only to A0J2 S91

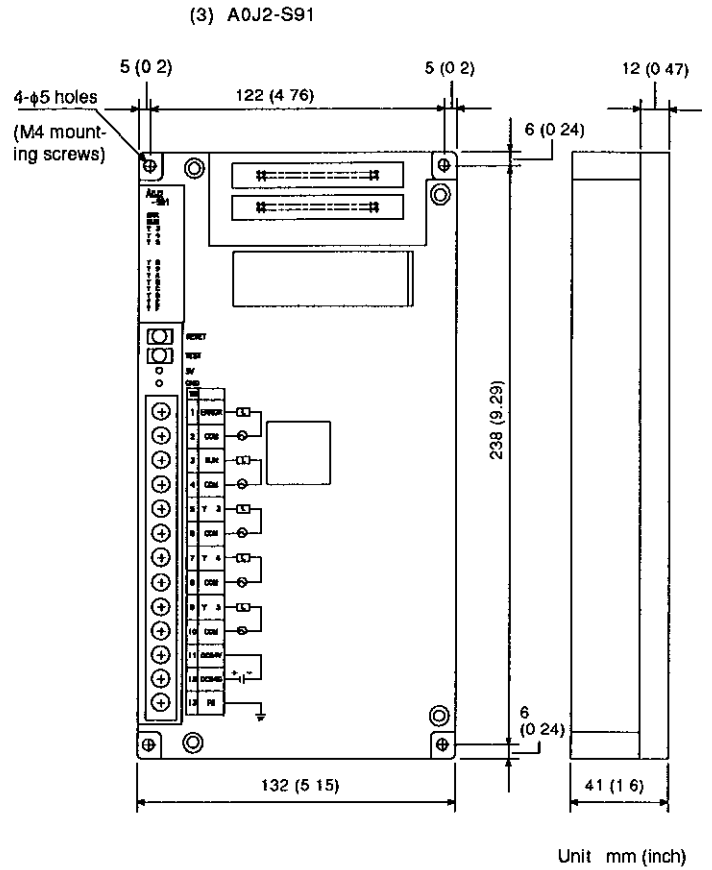
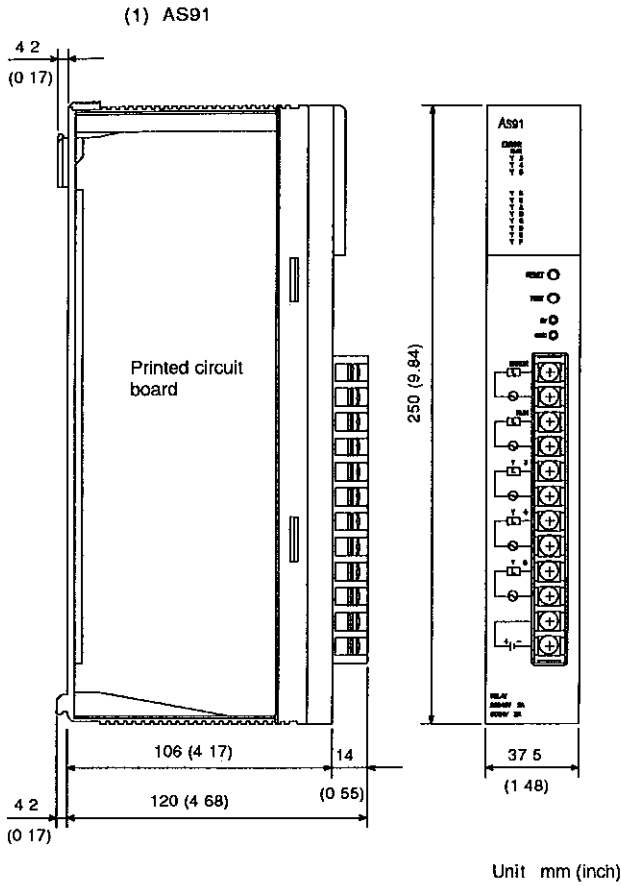
5. A0J2-S91 CONNECTING CABLE SPECIFICATIONS

5. A0J2-S91 CONNECTING CABLE SPECIFICATION

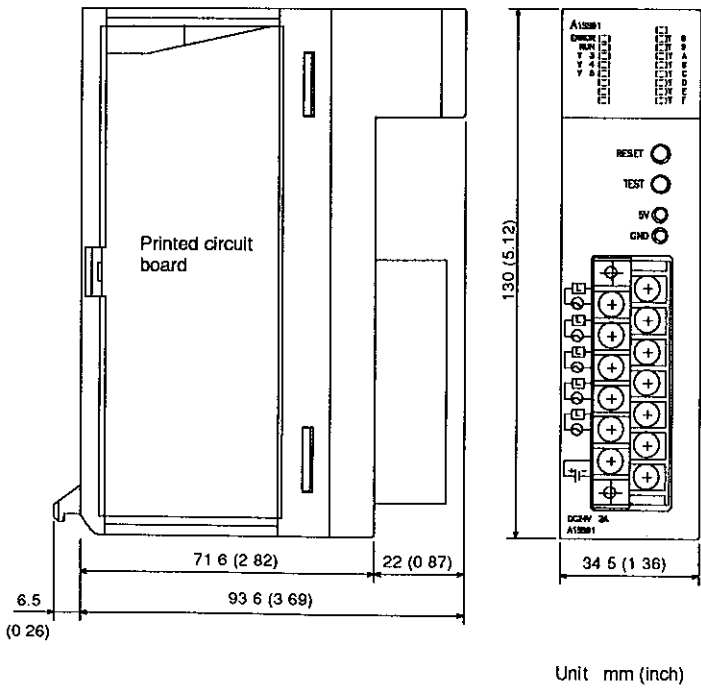
Cable Model Name	Cable Length mm (inch)	Resistance Value for 5 VDC Supply Line (Ω at 55 °C)	Weight kg (lb)	Application
A0J2C04B	400 (15.6)	0.0626	0.160 (0.352)	Cable between A type base and A0J2-S91
A0J2C10B	1000 (39)	0.126	0.260 (0.572)	
A0J2C04SB	400 (15.6)	0.025	0.110 (0.242)	Cable between A1S type base and A0J2 S91
A0J2C10SB	1000 (39)	0.048	0.180 (0.396)	
A0J2C01	80 (3.12)	0.047	0.025 (0.055)	Cable for stacked A0J2 units only
A0J2C03	300 (11.7)	0.0617	0.085 (0.187)	Cable for A0J2 units arranged side by side
A0J2C06	550 (21.45)	0.0882	0.130 (0.286)	Cable for A0J2 units arranged end to end

6. EXTERNAL DIMENSIONS

6 EXTERNAL DIMENSIONS



(2) A1SS91



REVISION

A	
Dec., 1995	

IMPORTANT

(1) Design the configuration of a system to provide an external protective or safety interlocking circuit for the PCs

(2) The components on the printed circuit boards will be damaged by static electricity, so avoid handling them directly. If it is necessary to handle them take the following precautions

- (a) Ground human body and work bench
- (b) Do not touch the conductive areas of the printed circuit board and its electrical parts with and non-grounded tools etc

Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment

All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples

Owing to the very great variety in possible applications of this equipment, you must satisfy yourself as to its suitability for your specific application

