AD75P1-S3/P2-S3/P3-S3 Positioning Module

User's Manual (Hardware)

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	AD75P-U-E(H/W)			
MODEL	12 1002			
CODE	13J883			
IB(NA)-66733-E(0412)MEE				

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SAFETY PRECAUTIONS ●

(Always read before starting use)

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

These precautions apply only to the installation of Mitsubishi equipment and the wiring with the external device. Refer to the user's manual of the CPU module to be used for a description of the PLC system safety precautions.

These • SAFETY PRECAUTIONS • classify the safety precautions into two categories: "DANGER" and "CAUTION".



Procedures which may lead to a dangerous condition and I cause death or serious injury if not carried out properly.



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 read it whenever necessary. Always forward it to the end user.

[DESIGN PRECAUTIONS]

DANGER

- Configure a safety circuit so that the safety of the overall system is maintained even when an external power error or PLC error occurs.
 - An accident may occur by a false output or a malfunction.
 - 1) Outside of the PLC, construct mechanical damage preventing interlock circuits such as emergency stop, positioning upper and lower limit switches.
 - 2) During machine zero point return operation, the module is controlled by two data: zero point return direction and zero point return speed, and speed begins to decelerate when the near point dog turns on. If the zero point return direction is set incorrectly, the module may continue to operate without decelerating. To prevent damage to the module in such cases, configure an interlock circuit outside the PLC.

!CAUTION

 Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.

They should be installed 100 mm (3.9 inch) or more from each other. Not doing so could result in noise that would cause malfunction.

[INSTALLATION PRECAUTIONS]

ACAUTION

- Use the PLC in an environment that meets the general specifications contained in this manual. Using this PLC in an environment outside the range of the general specifications could result in electric shook, fire, malfunction, and damage to or deterioration of the product.
- Insert the tabs at the bottom of the module into the mounting holes in the base module, and tighten the screws using the specified torque. If the module is not properly installed, it may result in malfunctions, failure, or fallout.
- Verify that the peripheral device connection connector and the external device connection connector is securely attached to the module connector. Confirm that it connects with an audible click. If not attached properly, a contact error may occur, resulting in incorrect input or output.
- Always attach a cover to connectors that are not used. If not covered, malfunctions may occur.
- Do not directly touch the module's conductive parts or electronic components.
 Doing so could cause malfunction or failure in the module.

[WIRING PRECAUTIONS]

ACAUTION

- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, failure, or malfunction.
- Perform soldering of the external device connection connector after verifying the pin layout.
- External device connections shall be correctly soldered.
 Imperfect connection could result in short circuit or erroneous operation.

[STARTUP AND MAINTENANCE PRECAUTIONS]

ACAUTION

- Switch off all phases of the externally supplied power used in the system before cleaning. If you do not switch off the external power supply, it will cause malfunctions of the module.
- Do not disassemble or modify the modules. Doing so could cause failure, malfunction, injury, or fire.
- Switch off all phases of the externally supplied power used in the system 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.
- Remove the external device connection connector after the system has been stopped. The system will stop if it is removed while the system is running.
- When performing test operation, set the parameter for the speed limit value to a slow setting and prepare for an immediate stop of the module should a dangerous condition occur during operation verification.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the module.

Failure to do so can cause the module to fail or malfunction.

[STARTUP AND MAINTENANCE PRECAUTIONS]

ACAUTION

• Exercise caution when the reference-axis speed for interpolation operation has been specified, since the speed of the opposite axis (second axis) can get greater than the set speed (speed limit value).

[DISPOSAL PRECAUTIONS]

ACAUTION

• When disposing of this product, treat it as industrial waste.

About the Manuals

The following product are available for this equipment. Refer to the table given below to choose suitable manuals.

Detailed Manual

Manual name	Manual No. (Model code)
Positioning module type AD75P1-S3/P2-S3/P3-S3,	IB-66716
AD75P1-S3/P2-S3/P3-S3 User's Manual	(13J871)

Detailed Manual

Manual name	Manual No. (Model code)
Positioning module software package type SW1IVD-AD75P Operating Manual	IB-66714 (13J915)
GX Configurator-AP Version 1 Operating Manual SW0D5C-AD75P-E	IB-66900 (13J948)

Correspondence to the EMC Directive and Low Voltage Instruction

To make the PLCs compliant with the EMC directive, refer to Chapter 3 "EMC AND LOW-VOLTAGE DIRECTIVE" in the PLC user's manual (Hardware).

* When the PLC CPU user's manual (Hardware) does not include Chapter 3" EMC AND LOW-VOLTAGE DIRECTIVE", refer to QnA Series CPU Compatible High-Speed Accessing Basic Base Unit-Additional Explanation for Product Conforming to EMC Standards (IB-68837) (optional).

1. Overview

This manual describes how to install AD75P1-S3/P2-S3/P3-S3 Positioning Module (hereafter abbreviated as AD75) and how to wire them with external devices. After unpacking AD75, please confirm that the following products are contained.

Produc		Quantity		
AD75P1-S3 Positioning Module		1		
AD75P2-S3 Positioning		1		
AD75P3-S3 Positioning			1	
Connector for external	Connector (10136-3000VE)	1	2	3
wiring (Model)	Connector cover (10336-56F0-008)	1	2	3

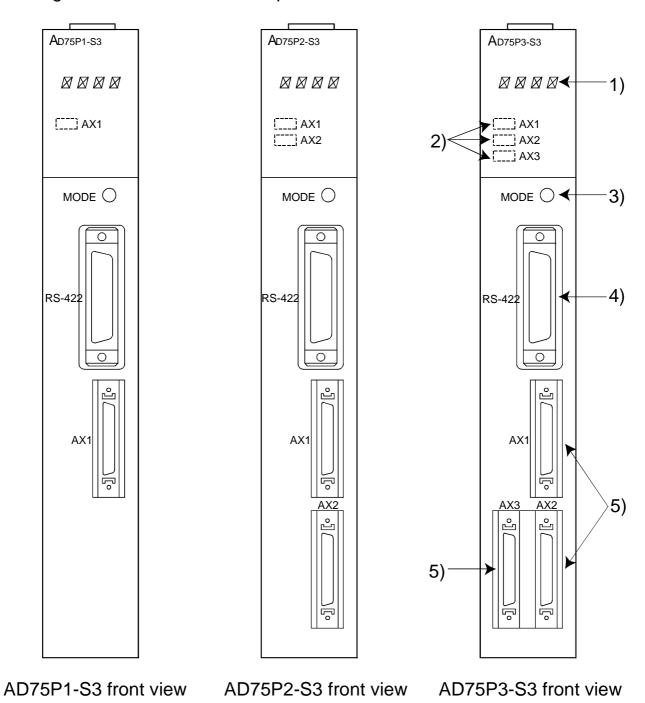
2. Performance Specifications

The performance specifications for the AD75 are shown below.

The performance specimeations for the 1010 are shown below.				
Item	Specifications			
Maximum output pulse	When connected to a differential driver : 400 kpps			
Maximum output puise	When connected to an open collector : 200 kpps			
Maximum connection	When connected to a differential driver :10 m			
distance between servos	When connected to an open collector :2 m			
Number of occupied I/O	32 points			
points	32 points			
Internal current	5VDC, 0.7A or less (However, when the AD75P3-S3 is			
consumption	connected with the differential driver method, the internal			
Consumption	current consumption value is 0.78A)			
External dimensions	250(H) × 37.5(W) × 106(D)mm			
Weight	0.45kg			

3. Name of Each Part

The following shows the name of each part.



No.	Name	Description		
1)	17-segment LED	 The operation state (1)) of the axis (2)) is indicated. RUN: The LED of the axis in operation is flashing TEST: All LEDs are turned on 		
2)	Axis display LEDs AX1 to 3	IDL : Turned off ERR : The LED of the axis where an error occurred is flashing		
3)	Mode switch	A selector switch that changes the mode.The mode is changed each time the switch is pressed.		
4)	Peripheral device connection connector	Connector for connection to peripheral device.		
5)	External device connection connector	Connects to the drive unit, machine input, or manual pulser. The applicable wire size for the connector is AWG #24 to #30 (0.05 to 0.2SQ). The pin layout for the included external device connector is as follows. Perform wiring according to the I/O interface. Wire Solder		
		The pin layout viewed from the top is shown. The connector pins are referred to as 1 to 36.		

4. Loading and Installation

The following is explanations of the handling precautions and installation environment which is common to modules when handling AD75 from unpacking to installation. For the details of loading and installation of the module, refer to User's Manual of PLC CPU module to be used.

4.1 Handling precautions

The following is an explanation of handling precautions of the module.

- (1) Because the case of the module is made of resin, be careful not to drop it or expose it to strong impact.
- (2) Do not remove the printed circuit board of the module from the case. This may cause malfunctions.
- (3) Be careful not to let foreign matters such as filings or wire chips get inside the module during wiring. When such matters do enter, be sure to remove them.
- (4) Execute tightening of the module's installation screws within the range indicated below.

Screw position	Tightening torque range
Module fixing screw (M4 screw)	78 to 118 N•cm

4.2 Installation environment

Do not install the A series PLC in the following environments.

- (1) Where the ambient temperature exceeds the 0 to 55°C range.
- (2) Where the ambient humidity exceeds the 10 to 90 % RH range.
- (3) Where condensation is produced by sudden temperature changes.
- (4) Where corrosive or combustible gas is present.
- (5) Where dust, iron powder and other conductive powder, oil mist, salt, or organic solvents are prevalent.
- (6) In direct sunlight.
- (7) Where a strong electric or magnetic field is generated.
- (8) Where vibration and shock may be transmitted directly to the module.

5. Wiring

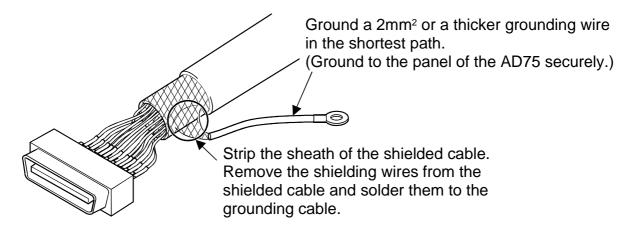
Precautionary notes when wiring as well as the I/O interface are described below.

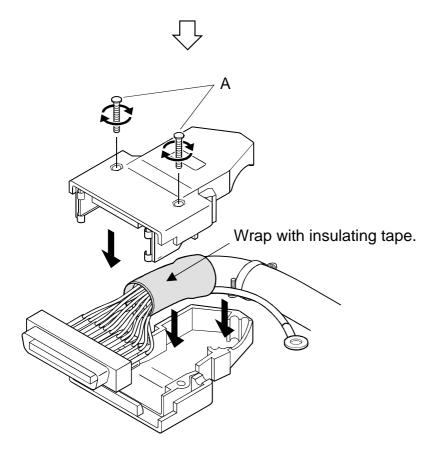
5.1 Precautions for wiring

- (1) Perform wiring of the AD75 correctly while checking the terminal arrangement.
- (2) Solder or crimp the external device connection connector correctly.

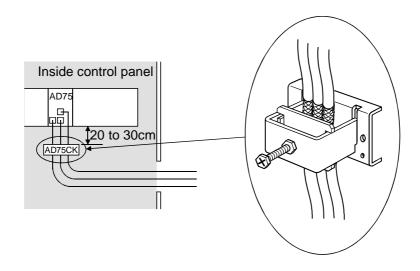
 An improperly soldered or crimped connector may cause malfunctions.
- (3) Be careful to avoid entry of chips, wiring dust and so on inside the AD75. Otherwise fire, failure or malfunction may be caused.
- (4) Be sure to install a cover for the external device connection connector if no external device is connected. Otherwise malfunction may be caused.
- (5) Connect the external device connection connector and peripheral device connection connector with the connector of the AD75. Check that the connector snaps. An improperly connected connector will cause poor continuity, possibly causing erroneous inputs or outputs.
- (6) Do not pull the cable when removing the cable from the AD75 or servo amplifier. Hold and pull the connector connected to the AD75 or servo amplifier. If the cable connected to the AD75 or servo amplifier is pulled, a malfunction may be caused. As well, the AD75, servo amplifier or cable may be broken.
- (7) Disconnect the external device connection connector when the system is stopped.
 If the external device connection connector is disconnected during operation of the system, the system will be stopped.
- (8) Route the cables connected to the AD75, in a duct, or fix them. If cables are not routed in the duct or no fixing measures are taken to them, drifting or moving cables, breakage of the AD75, servo amplifier or cable due to a carelessly pulled cable, or malfunction caused by a poorly connected cable may be caused.
- (9) Do not tie the AD75 cable with the main circuit cable, power cable, or a load cable for other than the programmable logic controller or do not route the AD75 cable near them. Separate these by 100 mm as a measure. Otherwise noise, surge or induction may cause a malfunction.
- (10) When routing the AD75 cable near a power cable at a distance smaller than 100 mm, use a shielded cable for a countermeasure against noise. Connect the shielding wire of the shielded cable securely to the panel of the AD75.

[Shielding wire processing example]

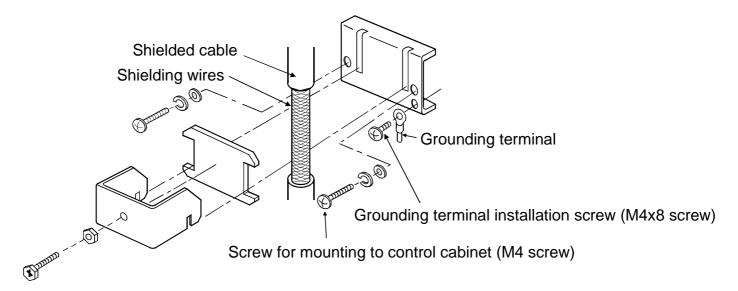




(11)To comply with EMC and low-voltage directives, use shielded cables and AD75CK cable clamp (made by Mitsubishi Electric) to ground to the panel.



[How to ground shilded cable using AD75CK]



- (12) The influence of noise may be reduced by mounting ferrite cores to the cable connected to the AD75 as a noise reduction technique. For the noise reduction techniques related to connection with the servo amplifier, also refer to the Instruction Manual of the servo amplifier.
- (13) If compliance with the EMC Directive is not required, the influence of external noise may be reduced by making the configuration compliant with the EMC Directive.
 For the configuration compliant with the EMC Directive, refer to Chapter 3 "EMC Directive, Low Voltage Directive" in the User's Manual (Hardware) of the used CPU module.
- (14) An effect may be produced on external noise by mounting ferrite cores or noise filter (power supply line filter) to the power supply line of the PLC as a noise reduction technique.

(Example) • Ferrite core

Type: ZCAT 3035-1330 (TDK ferrite core)

Noise filter

Type: MXB-1210-33 (DENSEI-LAMBDA noise filter)

5.2 I/O Interface

O: Wiring required \triangle : Wiring performed as required

I/O classification	External wiring	Pin number	Internal circuit	Signal na		Wiring requirement
	When the upper	11		Near-point dog signal	DOG	Δ
	not used When the lower	12		Upper limit signal	FLS	0
	limit switch is not used	13		Lower limit signal	RLS	0
		. 14		Stop signal	STOP	Δ
		. 15		Speed/positio n switch signal	CHG	Δ
Input		16		External start signal	STRT	Δ
	24VDC*	35 36		Common	СОМ	0
	5V •	(+) 9		Manual pulser	PULSER A+	
	A 5VDC	(-) 27	\$ (\$\frac{1}{2} \kappa	phase A	PULSER A-	•
	B OV	(+) 10		Manual pulser	PULSER B+	Δ
	Manual pulser (MR-HDP01)	(-) 28		phase B	PULSER B-	

^{*:} The terminal connected to the common line may be either positive or negative.

I/O classification	External wiring	Pin number	Internal circuit		Signal r	name	Wiring requirement
	When MR-J2-□A is used RD	7		Dri rea	ve unit Idy	READY	0
	INP	. 8		In- _I sig	position nal	INPS	Δ
Input	СОМ	26		Со	mmon	СОМ	0
	LZ	6 24		Zei sig	ro-point nal	PGO	Δ
	LZR	- 25		Со	mmon	PGO COM	
	When MR-J2-□A is used □ CR COM	5			viation unter clear	CLEAR	Δ
	įVDD !SG			Со	mmon	CLEAR COM	
	V	1			CW Phase A	PULSE F	
		19	**************************************	collector	PULSE	PULSE COM	O*
Output		2		Open col	CCW Phase B	PULSE R	
		20			SIGN	PULSE COM	
	PP	3(+)			CW Phase A	PULSE F+	
	PG	21(-)		Differential driver	PULSE	PULSE F-	O*
	NP	NP 4(+)	CCW Phase B	PULSE R+			
	NG	22(-)			SIGN	PULSE R-	

^{*} Select open collector output or differential driver output, according to the drive unit used.

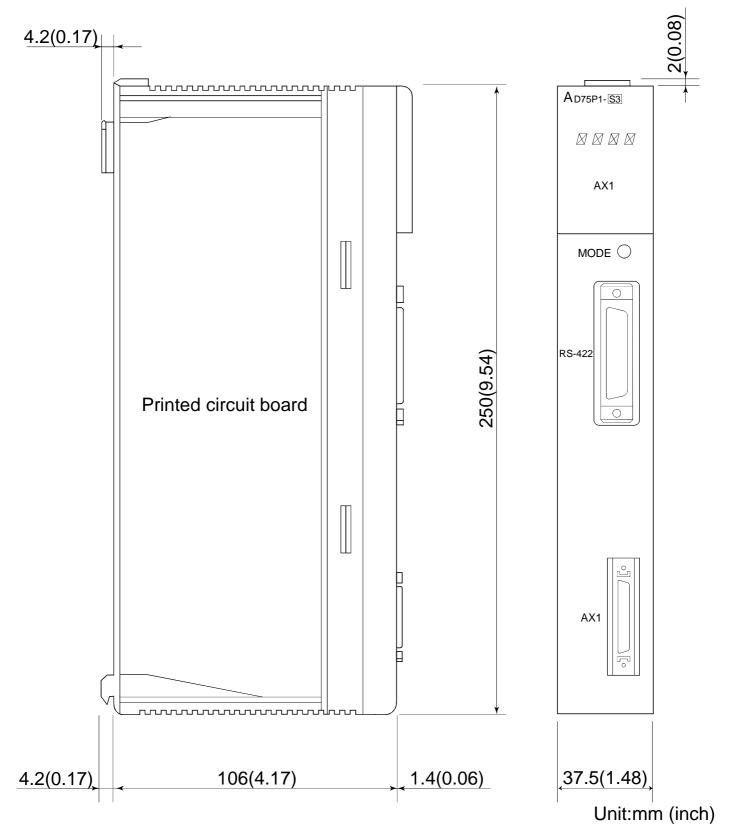
Remark

The following shows the relationship between "pulse output mode" selected via the parameter and the pulse output according to "pulse output logic selection".

Mode	Positiv	e logic	Negativ	/e logic
selection	Forward rotation	Reverse rotation	Forward rotation	Reverse rotation
CW				
CCW			-	
PULSE SIGN	High	Low	Low	High
Αφ Βφ				

6. External Dimensions

AD75P1-S3 is shown.



^{*} External dimensions are the same for AD75P1-S3, P2-S3 and P3-S3.

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

№ 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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