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[Title] Procedures for Replacing Positioning Module   **[Date of Issue** Oct., '03
     AD71 with AD75P

[Relevant Models] A1SD75P☐-S3/AD75P☐-S3

Thank you for your continued support of Mitsubishi programmable logic controllers, MELSEC-A series.

This bulletin is written for those intending to replace the AD71/A1SD71 positioning module with the AD75P/ A1SD75P, including relevant information such as specification changes, method of replacement and recommended equipment such as connectors, cables, etc.

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Introduction

The performance of the AD75P is improved compared to the AD71, as explained below:

(1) Reduced start processing time

(a) With the addition of enhanced high-speed processing, the start processing time for "positioning control start" is reduced to 20ms.
(Compared to the AD71, the maximum processing times for independent positioning and for interpolation positioning are 58ms and 94ms respectively.)

(2) Easier maintenance

(a) Positioning data and parameter settings are stored in the AD75P flash ROM; therefore data can be retained without the need for batteries.
(b) The 17-segment display provides a visual means for checking errors or input signals.
(c) The history function enables checking of historical data such as start, errors or warning data.

When using the AD75P, it is recommended to also obtain the "GX Configurator-AP" configuration software package. This software provides an easier method to reconfigure positioning data, debug the positioning control system, etc.

In this bulletin, the module names are referred to as shown in the table below.

Generic term	Model Name
AD71	AD71, AD71S1, AD71S2, AD71S7, A1SD71-S2, A1SD71-S7
AD71S2	AD71S2, A1SD71-S2
AD71S7	AD71S7, A1SD71-S7
AD75P	AD75P1-S3, AD75P2-S3, AD75P3-S3, A1SD75P1-S3, A1SD75P2-S3, A1SD75P3-S3

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1. Functional comparison between AD71 and AD75P

1.1 Table of functional comparisons

The following table shows functional comparisons between the AD71 and AD75P. For programs, refer to Chapter 7.

○: Compatible (no restrictions), △: Compatible (with restrictions), ×: No alternative

Function		AD71			AD75P	Compatibility
		AD71	AD71S1	AD71S2 A1SD71-S2	AD71S7 A1SD71-S7	AD75P2-S3 A1SD75P2-S3	
No. of control axes		2 axes				2 axes	○
Manual pulse generator operation *1		Available		–	Available	Available	△
	Applicable manual pulse generator	HD52B (Mitsubishi Electric Corp.), OSM-01-2(C) (Nemicon).				MR-HDP01 (Mitsubishi Electric Corp.)	Usable products are different between AD71 and AD75P.
JOG operation		Available				Available	○
Zero point return		Available				Available	○
Positioning / Position control mode	1-time positioning (End)	Available				Available (independent positioning)	○
	n-time positioning (Continued)	Available				Available (continuous positioning)	○
	Continue positioning, while changing speed (Pattern change)	Available				Available (continuous path)	○
	Linear interpolation	Available				Available	○
	Speed/Position control switching mode	–		Available	–	Available	○
	Speed control mode	–		Available	–	Available	○
No. of positioning data		400/axis				600/axis	○
Acceleration/Deceleration time		Same for Accel. and Decel. times (1 pattern)				Individual setting for Accel./Decel. time (4 patterns for each)	○
Backlash compensation		Available				Available	○
Error compensation		Available				N/A	△ *2
M code		Available				Available	○
M code comment display		Available				N/A	×
Data storage		SRAM (with battery backup)				Flash ROM (without battery)	△ *3
No. of occupied slots		32 points/slot		AD71S2, AD71S7 : 32 points/slot		32 points/slot	△ *4
				A1SD71-S2, A1SD71-S7 : 48 points/2 slots			
I/O signal lines	Upper/Lower limit switch signal (FLS/RLS input signal)	N/A				Available	External wiring is required for AD75P.
	START signal (Output signal)	Available				N/A	×
	Pulse output (Output signal)	Open collector	Differential driver	Open collector		Open collector/ Differential driver	○
	Other signals	Available				Available	○
Current consumption		1.5A (0.8A for A1SD71-S2/S7)				0.7A	–

*1: By setting Manual pulse generator selection parameter $\boxed{\text{Pr.23}}$, 2-axis operation with a manual pulse generator is available for the AD75P.

For further details, refer to Section 5.2.3 "Detailed parameters" of the AD75P User's Manual.

*2: The AD75P substitutes electronic gears.

*3: No. of writes to flash ROM is up to 100,000.

*4: When replacing the A1SD71-S2 or A1SD71-S7, mount a blanking module in the empty slot.

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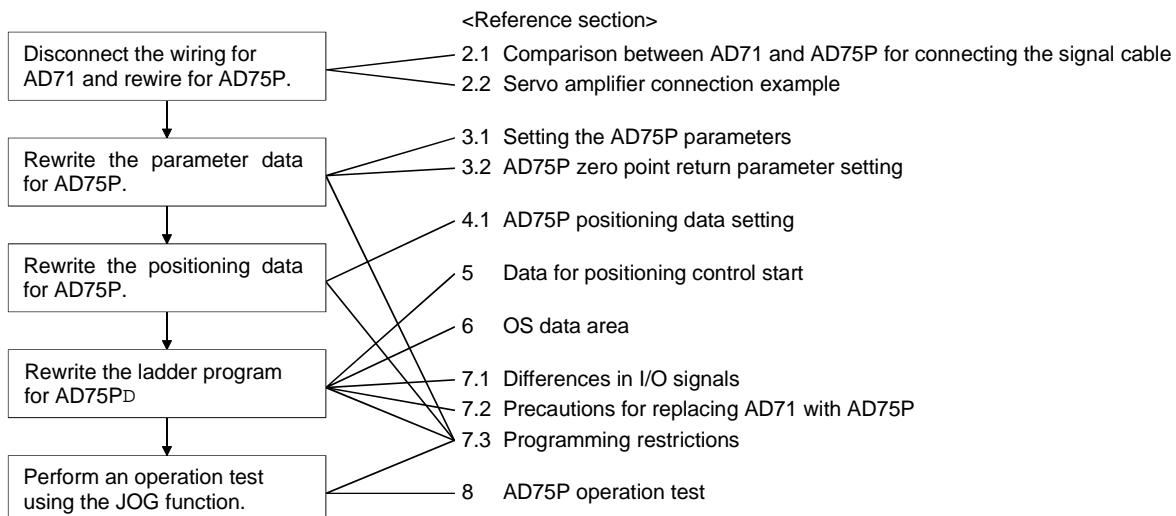
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    AD71 with AD75P

[Relevant Models] A1SD75P□-S3/AD75P□-S3

1.2 Replacement procedure flowchart

This flow chart shows the procedures to replace the AD71 with the AD75P. This bulletin provides relevant explanations in the order shown below.


```
                                        <Reference section>
┌──────────────────────────┐           2.1  Comparison between AD71 and AD75P for connecting the signal cable
│ Disconnect the wiring for│           2.2  Servo amplifier connection example
│ AD71 and rewire for AD75P.│
└──────────────────────────┘           3.1  Setting the AD75P parameters
┌──────────────────────────┐           3.2  AD75P zero point return parameter setting
│ Rewrite the parameter data│
│ for AD75P.                │           4.1  AD75P positioning data setting
└──────────────────────────┘
┌──────────────────────────┐           5    Data for positioning control start
│ Rewrite the positioning data│
│ for AD75P.                │           6    OS data area
└──────────────────────────┘
┌──────────────────────────┐           7.1  Differences in I/O signals
│ Rewrite the ladder program│           7.2  Precautions for replacing AD71 with AD75P
│ for AD75PD                │           7.3  Programming restrictions
└──────────────────────────┘
┌──────────────────────────┐           8    AD75P operation test
│ Perform an operation test │
│ using the JOG function.   │
└──────────────────────────┘
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2. Rewiring

2.1 Comparison between AD71 and AD75P for connecting the signal cable

		AD71	AD75P
1-axis control		AD71 signal connector (40-pin) is usable for X and Y axes.	AD75P signal connector (36-pin) is separate for each axis. (One-to-one connection cable to the driver)
2-axis control		AD71 signal connector (40-pin) is usable for X and Y axes (Bifurcated type cable).	AD75P signal connector (36-pin) is separate for each axis. (Straight pin-to-pin connection type cable to the driver)
Connector type*1		Connector) Set: A6CON Connector cover Manufacturer: Mitsubishi Electric Corp.	Connector: 10136-3000VE Connector cover: 10336-56F0-008 Manufacturer: Sumitomo 3M Ltd.

*1: The connector is included with both the AD71 and AD75P.

New signal cables are required for the AD75P, as the connector shape for the external signal connection and signal specifications are different from the AD71. The following dedicated cables are available for connecting the AD75P to the servo amplifier (please use the correct cable corresponding to the servo amplifier used).

<Dedicated cable>

| Module	Servo amplifier	Applicable cable
AD75P	MR-J☐A	AD75C20SJ
	MR-H☐A(N)	AD75C20SH
	MR-MR-J2(S) - ☐A	AD75C20SJ2
	MR-C☐A	AD75C20SC

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[Title] Procedures for Replacing Positioning Module
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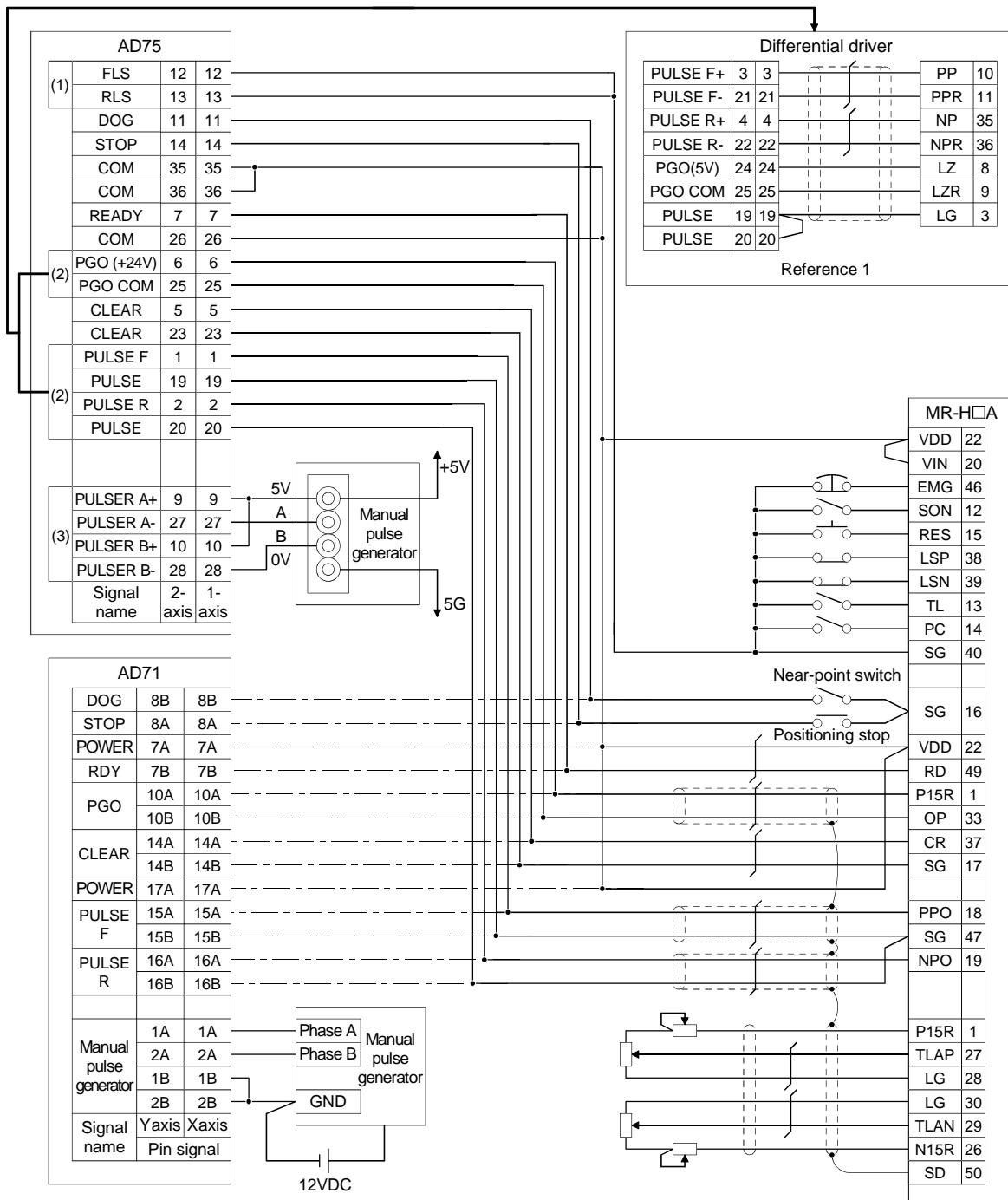
[Relevant Models] A1SD75P□-S3/AD75P□-S3

2.2 Servo amplifier connection example

Connection example with the servo amplifier (MR-H-A(N))

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(1) If the upper limit switch (FLS) signal and/or lower limit switch (RLS) signal of the AD75P will not be used, connect it to the "0V" terminal (SG on the servo amplifier side).

(2) For the pulse output, choose either the open collector or the differential driver depending on the external device. When choosing the differential driver, connect the cable referring to the connection example [Reference 1] on the previous page.

(3) The manual pulse generator for the AD71 is not compatible with the AD75P, therefore it is recommended to use one designed for the AD75P. (Recommended: Mitsubishi Electric Corp. MR-HP01)
    The input pulse from the manual pulse generator (MR-HP01) is counted in multiples of 4.

(MR-HP01 External Dimensions)
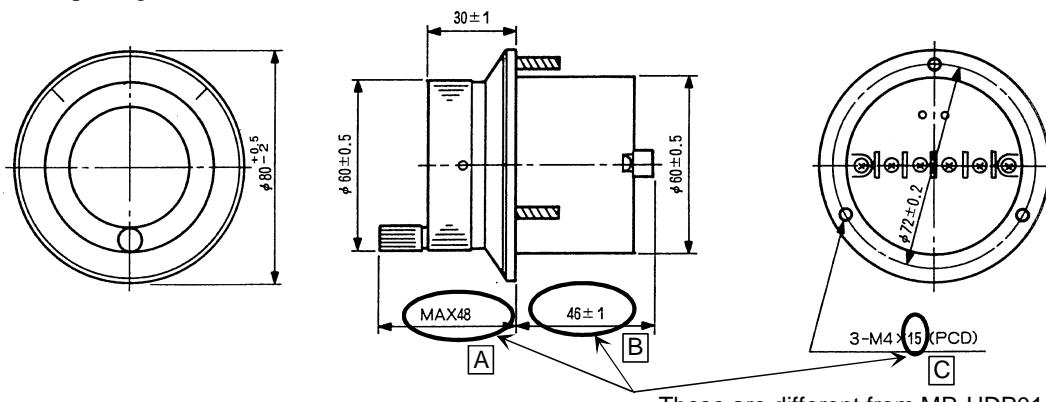
The manual pulse generator for the AD71 and for the AD75 has identical dimensions except for the following three parts, A, B and C.
 Please pay attention when replacing them.

Reference
Manual pulse generator external dimensions for the AD71, OSM-01-2(C)

These are different from MR-HDP01

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(4) The external start signal (STRT) and the in-position signal (INPS, INPS COM) for the AD75P does not need to be connected.

(5) Although for the AD71S2 the speed/position switching enable signal (1A, 1B) is used, for the AD75P write data to the Speed/position changeover enable flag $\boxed{\text{Cd.20}}$, in order to switch between speed/position.

(6) The START signal (Mechanical brake release) 11A and 11B for the AD71 is functionally different from the AD75P START signal (External start) and cannot be used for the same task. Therefore, to replicate the AD71 START signal functionality in the AD75P, it is recommended to create a ladder program, which performs the same function. Then, to connect an output module (e.g. AY40) that outputs a signal (Y☐) corresponding to the ladder program, which mimics the functionality (e.g. Mechanical brake release). Please select an appropriate output module suitable for your system.

   The following table shows specifications of the AD71 START signal and main output modules.

	START signal of AD71	AY10	AY40	AY70
Output	Open collector	Contact output	Transistor output (Open collector)	Transistor output (Open collector)
Load voltage	4.75 to 26.4V DC	5 to 125V DC	10.2 to 40V DC	4.5 to 15V DC
Load current	10mA (Max.)	2A	100mA	16mA

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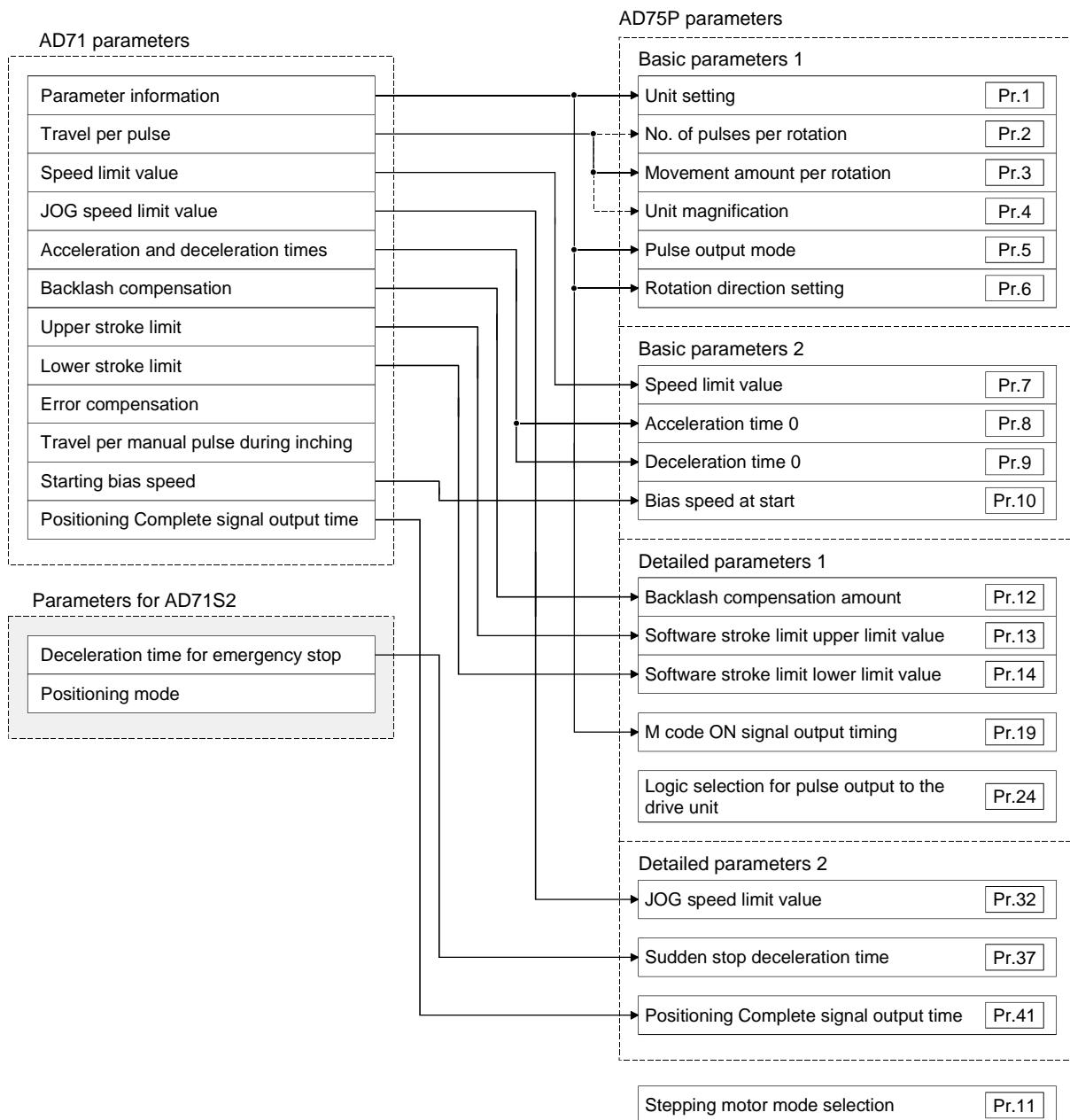
3.　Parameter Settings

3.1　Setting the AD75P parameters (Correlation of AD71 and AD75P parameters)

Set the AD75P parameters corresponding to the AD71 parameters.

AD71 parameters

- Parameter information
- Travel per pulse
- Speed limit value
- JOG speed limit value
- Acceleration and deceleration times
- Backlash compensation
- Upper stroke limit
- Lower stroke limit
- Error compensation
- Travel per manual pulse during inching
- Starting bias speed
- Positioning Complete signal output time

Parameters for AD71S2

- Deceleration time for emergency stop
- Positioning mode

AD75P parameters

Basic parameters 1

Unit setting	Pr.1
No. of pulses per rotation	Pr.2
Movement amount per rotation	Pr.3
Unit magnification	Pr.4
Pulse output mode	Pr.5
Rotation direction setting	Pr.6

Basic parameters 2

Speed limit value	Pr.7
Acceleration time 0	Pr.8
Deceleration time 0	Pr.9
Bias speed at start	Pr.10

Detailed parameters 1

Backlash compensation amount	Pr.12
Software stroke limit upper limit value	Pr.13
Software stroke limit lower limit value	Pr.14
M code ON signal output timing	Pr.19
Logic selection for pulse output to the drive unit	Pr.24

Detailed parameters 2

JOG speed limit value	Pr.32
Sudden stop deceleration time	Pr.37
Positioning Complete signal output time	Pr.41

Stepping motor mode selection	Pr.11

For details on the AD75P parameters, refer to the AD75P User's Manual, Section 5.2 "List of parameters".

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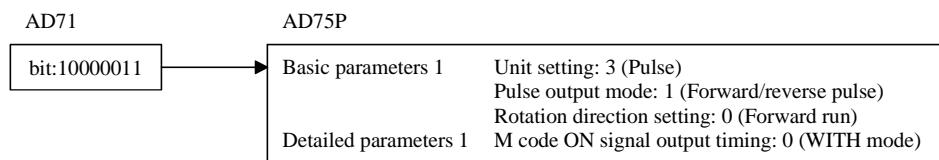
[Relevant Models] A1SD75P□-S3/AD75P□-S3

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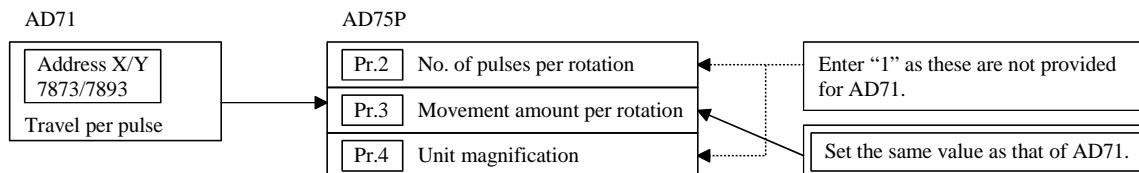
(1) Parameter information

	AD71 Address X/Y 7872/7892	AD75P
	Unit setting 00: mm 01: inch 10: degree 11: pulse	Pr.1 Unit setting 0: mm 1: inch 2: degree 3: pulse
	Rotation direction setting 0: Current value increment with forward run pulse output 1: Current value increment with reverse run pulse output	Pr.6 Rotation direction setting 0: Current value increment with forward run pulse output 1: Current value increment with reverse run pulse output
	Pulse output mode 0: pulse + SIGN 1: Forward or reverse pulse	Pr.5 Pulse output mode 0: pulse + SIGN 1: Forward or reverse pulse
	Positioning method 00: Absolute 01: Increment 10: Absolute/increment combined	Positioning method Setting is not required as it is specified with positioning data.
	M code ON signal output timing 0: WITH mode 1: AFTER mode	Pr.19 M code ON signal output timing 0: WITH mode 1: AFTER mode

(Example)   Unit setting: pulse
           Pulse output mode: Forward/reverse pulse
           Rotation direction setting: Forward run
           M code ON timing: WITH mode

AD71   AD75P

bit:10000011	→	Basic parameters 1 Unit setting: 3 (Pulse) Pulse output mode: 1 (Forward/reverse pulse) Rotation direction setting: 0 (Forward run) Detailed parameters 1 M code ON signal output timing: 0 (WITH mode)

(2) Movement amount per pulse/Error compensation

AD71   AD75P

Address X/Y 7873/7893 Travel per pulse	→	Pr.2 No. of pulses per rotation	⇠	Enter "1" as these are not provided for AD71.
		Pr.3 Movement amount per rotation		
		Pr.4 Unit magnification	⇠	Set the same value as that of AD71.

When using the error compensation function of the AD71, refer to the AD75P User's Manual, Section 12.3.2 "Electronic gear function" to set "No. of pulses per rotation", "Movement amount per rotation" and "Unit magnification".

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(3) **Speed limit value, JOG speed limit value, Bias speed at start**
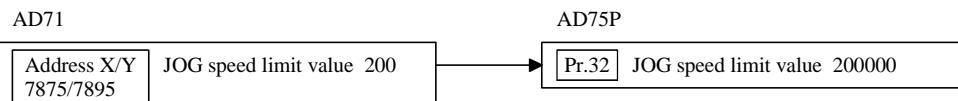
The units for the Speed limit value, JOG speed limit value and Bias speed at start of the AD71 and AD75P differ as shown in the following table.

	Unit			
	mm	inch	degree	pulse
AD71	$\times 10^1$ mm/min	$\times 1$ inch/min	$\times 1$ degree/min	$\times 10^1$ pulse/s
AD75P	$\times 10^{-2}$ mm/min	$\times 10^{-3}$ inch/min	$\times 10^{-3}$ degree/min	$\times 10^0$ pulse/s
Multiplication factor*1	$\times 1000$	$\times 1000$	$\times 1000$	$\times 10$
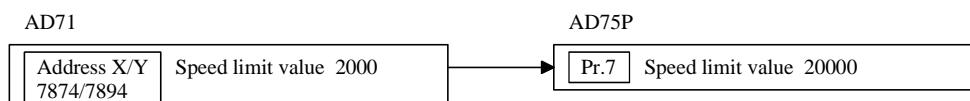
*1: For the AD75P, multiply the AD71 data by a 1000 for "mm", "inch" or "degree" or by 10 for "pulse". Please revise values when they are set through not only sequence programs but also using GOT or via Ethernet.

(Example)   Unit: mm (inch, degree)   JOG speed limit value 2000 mm/min

AD71 → AD75P

| Address X/Y 7875/7895 | JOG speed limit value 200 | → | Pr.32 | JOG speed limit value 200000 |
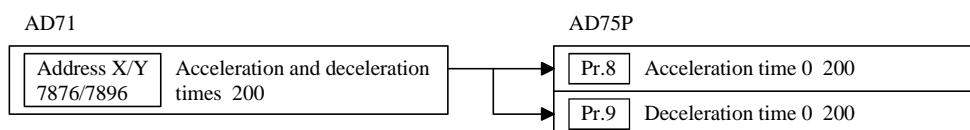
(Example)   Unit: pulse   Speed limit value 20000 pulse/s

AD71 → AD75P

| Address X/Y 7874/7894 | Speed limit value 2000 | → | Pr.7 | Speed limit value 20000 |

(4) **Acceleration and deceleration times**
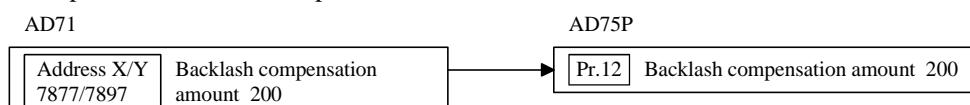
For the "Acceleration and deceleration times" of the AD71, enter the same value into both the "Acceleration time 0" and "Deceleration time 0" of the AD75P Basic parameters 2.

(Example)   Acceleration and deceleration times 200ms

AD71 → AD75P

| Address X/Y 7876/7896 | Acceleration and deceleration times 200 | → | Pr.8 | Acceleration time 0 200 |
| | | → | Pr.9 | Deceleration time 0 200 |

(5) **Backlash compensation amount**

(Example)   Unit: pulse   Backlash compensation amount 200

AD71 → AD75P

| Address X/Y 7877/7897 | Backlash compensation amount 200 | → | Pr.12 | Backlash compensation amount 200 |

(6) **Travel amount per pulse of manual pulse generator**

The AD75P does not have the setting item equivalent to "Travel per manual pulse during inching" of the AD71. Since it is determined by the setting of the axis control data, Cd.23 "Manual pulse generator 1 pulse input magnification", refer to the AD75P User's Manual, Section 11.3 "Manual pulse generator operation".

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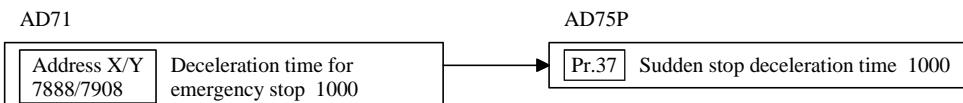
[Relevant Models] A1SD75P☐-S3/AD75P☐-S3

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(7) Emergency stop deceleration time (for AD71S2)

With the Deceleration time for emergency stop of the AD71S2, set the same value to Pr.37 "Sudden stop deceleration time" of the AD75P Detailed parameters 2.
Refer to the AD75P User's Manual, Section 6.5.6 "Stop program" for further details.

AD71

| Address X/Y 7888/7908 | Deceleration time for emergency stop 1000 |

AD75P

| Pr.37 | Sudden stop deceleration time 1000 |
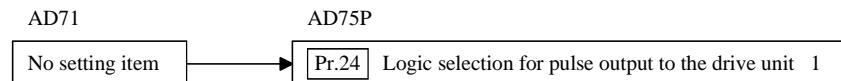
(8) Positioning mode (for AD71S2)

Setting the Position control mode, Speed/position switching mode and Speed control mode in the positioning mode of the AD71S2 is different to the AD75P. Therefore, for the AD75P, set it using the positioning identifier of the positioning data.

(9) Logic selection for pulse output to the drive unit

No setting item is provided for the AD71 because only negative logic output is available.
For the AD75P, set it to "1" to select negative logic.

0: Positive logic   1: Negative logic

AD71

| No setting item |

AD75P

| Pr.24 | Logic selection for pulse output to the drive unit 1 |

(10) Stepping motor mode

When replacing the AD71 with the AD75P where the stepping motor is used, set "1" to Pr.11 Stepping motor mode of the AD75P Basic parameters 2.
For details, refer to the AD75P User's Manual, Section 12.6.6 "Stepping motor mode function".

0: Standard mode   1: Stepping motor mode

AD71

| No setting item |

AD75P

| Pr.11 | Stepping motor mode 1 |

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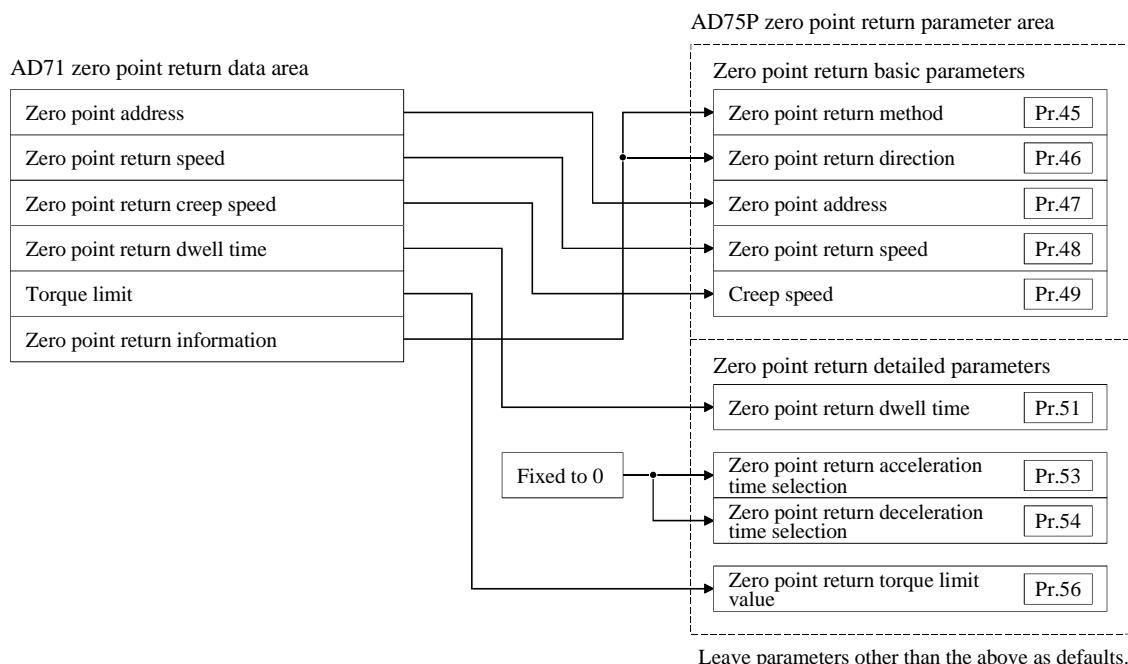
[Relevant Models] A1SD75P□-S3/AD75P□-S3

3.2 AD75P zero point return parameter setting
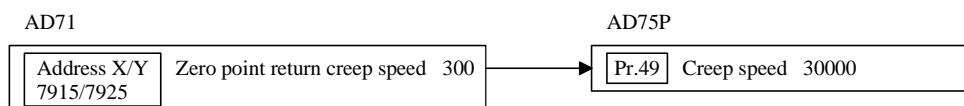
Set the AD75P zero point return data corresponding to the AD71 data.

AD75P zero point return parameter area

AD71 zero point return data area   Zero point return basic parameters

AD71 zero point return data area		AD75P zero point return basic parameters	
Zero point address	→	Zero point return method	Pr.45
Zero point return speed	→	Zero point return direction	Pr.46
Zero point return creep speed	→	Zero point address	Pr.47
Zero point return dwell time	→	Zero point return speed	Pr.48
Torque limit	→	Creep speed	Pr.49
Zero point return information			

Zero point return detailed parameters

Zero point return dwell time	Pr.51	
Fixed to 0 →	Zero point return acceleration time selection	Pr.53
	Zero point return deceleration time selection	Pr.54
	Zero point return torque limit value	Pr.56

Leave parameters other than the above as defaults.

(1) Zero point return speed, Zero point return creep speed

For the AD75P, multiply the AD71 data by a 1000 for "mm", "inch" or "degree", or by 10 for "pulse". (For multiplication factor, refer to Section 3.1 (3).)

(Example)   Unit: mm   Zero point return creep speed 300 mm/min

AD71   AD75P

Address X/Y 7915/7925	Zero point return creep speed 300	→	Pr.49	Creep speed 30000

(Example)   Unit: pulse   Zero point return speed 20000 pulse/s
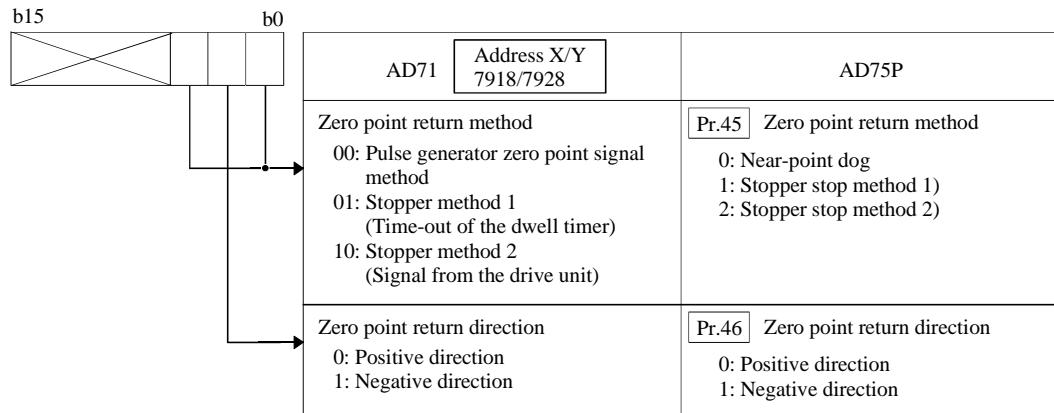
AD71   AD75P

Address X/Y 7914/7924	Zero point return speed 2000	→	Pr.48	Zero point return speed 20000

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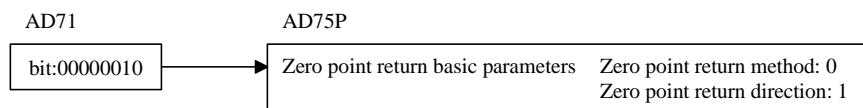
[Relevant Models] A1SD75P☐-S3/AD75P☐-S3

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(2) Zero point return information

(Example) Zero point return method: Pulse generator method
           Zero point return direction: Negative direction

AD71		AD75P
bit:00000010	→	Zero point return basic parameters Zero point return method: 0 Zero point return direction: 1

(3) Zero point return acceleration time selection/ Zero point return deceleration time selection

These items are required to be set for the AD75P although they are not provided for the AD71. Therefore, to keep the consistency in these values, select the default value "0". (Setting the default "0" ensures the value Acceleration/deceleration time of the positioning data are the same.)

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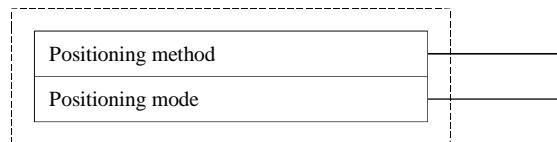
4. Positioning data settings

4.1 AD75P positioning data setting
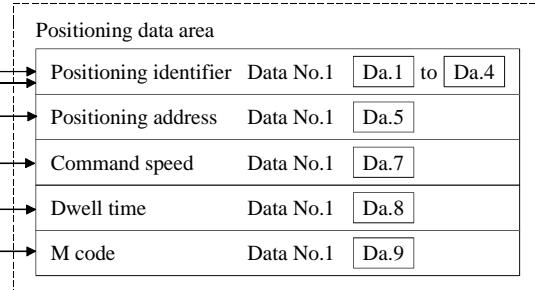
The positioning data stored in the AD75P buffer memory configuration is different from the AD71. Therefore, refer to the following positioning data configuration, and replace the AD71 positioning data with those of the corresponding AD75P data.

(Da.6 "Arc address" is omitted from the following AD75P positioning data area.)

AD71 parameters

Positioning method
Positioning mode

AD71 positioning data area

Positioning information area
Positioning information   Data No.1

Positioning speed area
Positioning speed   Data No.1

Dwell time area
Dwell time   Data No.1

Positioning address area
Positioning address   Data No.1

AD75P positioning data area

Positioning data area
Positioning identifier   Data No.1   Da.1 to Da.4
Positioning address   Data No.1   Da.5
Command speed   Data No.1   Da.7
Dwell time   Data No.1   Da.8
M code   Data No.1   Da.9

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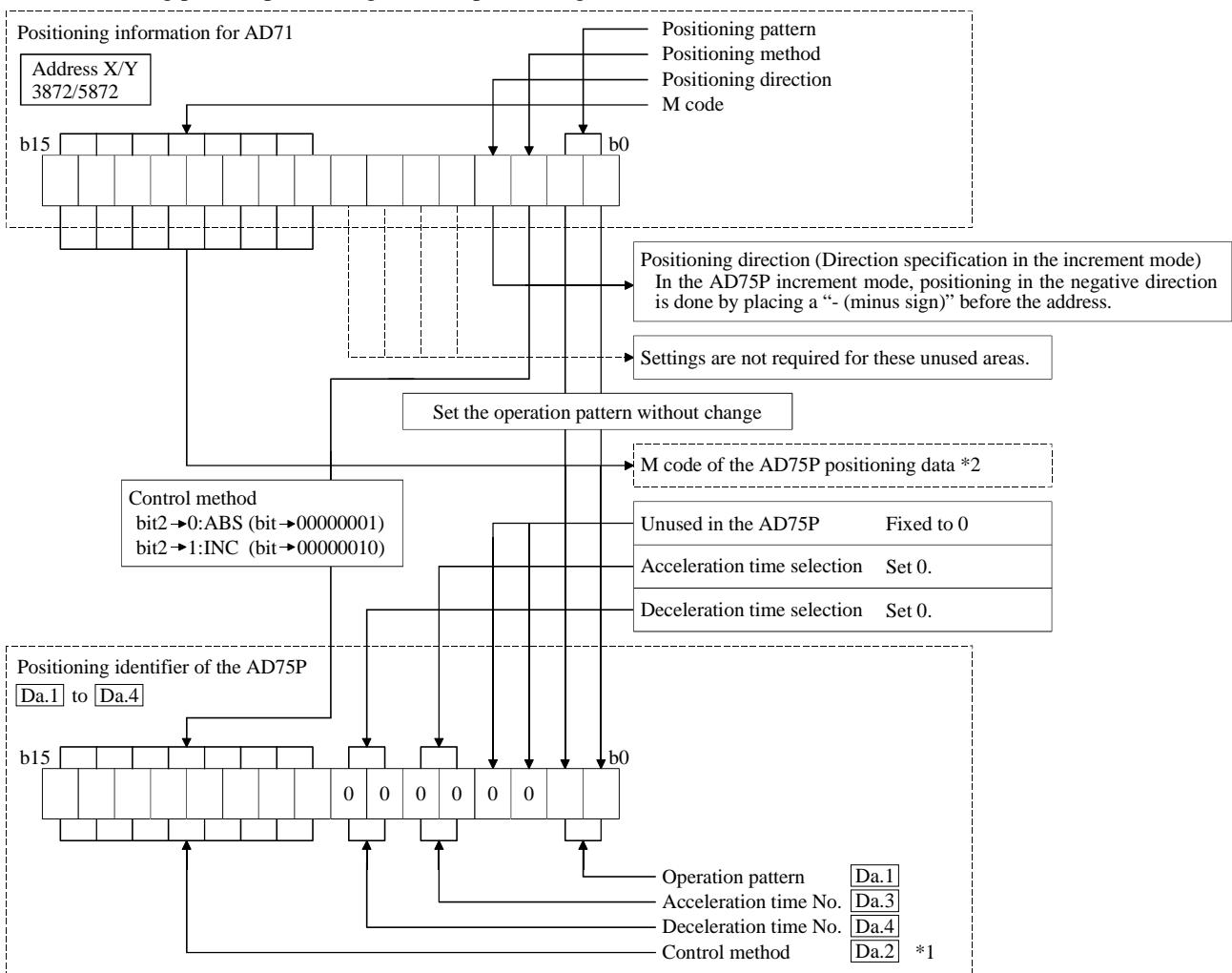
[Relevant Models] A1SD75P□-S3/AD75P□-S3

(1) Positioning information
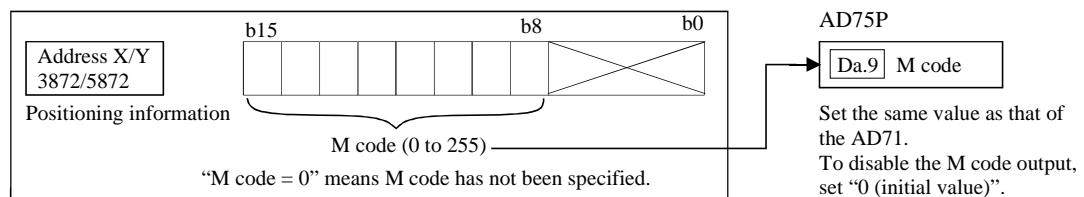
Positioning pattern, positioning method, positioning direction and M code

*1: Control method setting
In the AD75P, the positioning control (e.g. linear/circular interpolation), speed control, speed/position switching control is specified in the control method setting, which enables each positioning data to be set individually.

*2: M code

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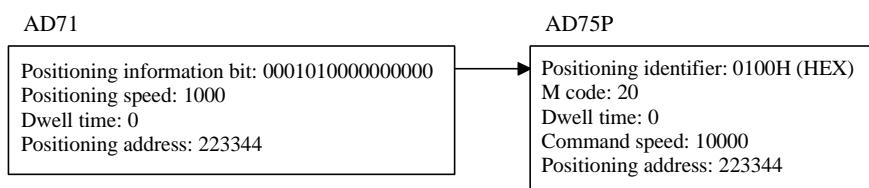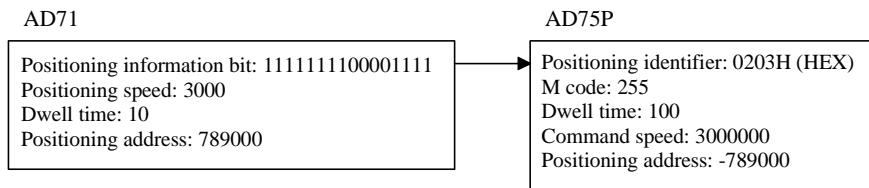
[Relevant Models] A1SD75P□-S3/AD75P□-S3

(Example 1)   Positioning pattern: Positioning end
                Positioning method: Absolute
                M code: 20
                Positioning speed: 10000 pulse/s
                Dwell time: 0
                Positioning address: 223344 pulses

AD71

```
Positioning information bit: 0001010000000000
Positioning speed: 1000
Dwell time: 0
Positioning address: 223344
```

→ AD75P

```
Positioning identifier: 0100H (HEX)
M code: 20
Dwell time: 0
Command speed: 10000
Positioning address: 223344
```

(Example 2)   Positioning pattern: Change speed and continue positioning
                Positioning method: Increment
                M code: 255
                Positioning speed: 30000 mm/min
                Dwell time: 100ms
                Positioning address: -78900μm

AD71

```
Positioning information bit: 1111111100001111
Positioning speed: 3000
Dwell time: 10
Positioning address: 789000
```

→ AD75P

```
Positioning identifier: 0203H (HEX)
M code: 255
Dwell time: 100
Command speed: 3000000
Positioning address: -789000
```

4.2 Number of positioning data

The AD71 has capability of up to 400 data settings, where data No.1 to 400 can be directly set in the ladder program. However, for the AD75P, although data No.1 to 100 can be set directly from the ladder program, data from No.101 to 400 must be set using the block transmission method, as the AD75P buffer memory does not have the area to store this data.
Refer to the AD75P User's Manual, Section 7.2 "Data transmission process" for details.

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5. Data for positioning control start

AD71 start data area

AD71 start data area
Start data No.1
Start data No.2
Start axis
⋮
Start data No.20
Start axis
Pointer
Speed change data
Present value change data
Status
JOG speed
Error code
M code
Manual pulse enabled
Executing data No.
M code comment area
Error reset

AD75P monitor area

Axis monitor

Axis monitor	
Valid M code	Md.32
Axis error No.	Md.33
Status	Md.40
Positioning data No. being executed	Md.54

AD75P axis control data area

Axis control data

Axis control data	
Positioning start No.	Cd.11
Axis error reset	Cd.12
New current value	Cd.15
New speed value	Cd.16
Speed change request	Cd.17
JOG speed	Cd.19
Manual pulse generator enable flag	Cd.22
Manual pulse generator 1 pulse input magnification	Cd.23

This function is not provided for the AD75P. Attention is required when using this.

For AD71S2

For AD71S2
Emergency stop area
Travel distance change area
Restart request area

For AD71S7

For AD71S7
Manual pulse output speed

Detailed parameters 2

Detailed parameters 2	
Stop group 1 sudden stop selection	Pr.38
Stop group 2 sudden stop selection	Pr.39
Stop group 3 sudden stop selection	Pr.40

Axis control data

Axis control data	
Restart command	Cd.13
Speed/position changeover enable flag	Cd.20
Speed/position changeover control movement amount change register	Cd.21

Use the block start function to utilize the points set for continuous positioning of the AD71. For details, refer to the AD75P User's Manual, Section 10.3.2 "Block start".

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---

(1) Start data No.

The number of positioning data to be used is set in the ☐Cd.11 "Positioning start No." of the AD75P.

(Setting example)

AD71		AD75P	
Address X/Y 0/300	Start data	☐Cd.11 Cd.11 Positioning start No.	

・ 1 to 400: Positioning data No.

・ 1 to 600: Positioning data No.
・ 7000 to 7010: Block start specification
・ 8001 to 8050: Indirect specification
・ 9001: Machine zero point return
・ 9002: High-speed zero point return
・ 9003: New current value

☐CAUTION

For continuous positioning set using pointers, when the interpolation start or both-axis start is set for the next point, the AD71 does not start the next point until the current positioning of both axes is completed.

(a) For the AD71

The above method is not supported by the AD75P. (During interpolation, when the X axis is started while the Y axis is still executing, positioning will stop and an error will occur.) Therefore, for the AD75P, separate the start of the positioning into two instances (as shown in the diagram "(b) For the AD75P"). This can be done by creating a ladder program to ensure that the 2-axis linear interpolation or both-axis start is executed after completion of the 2-axis positioning.

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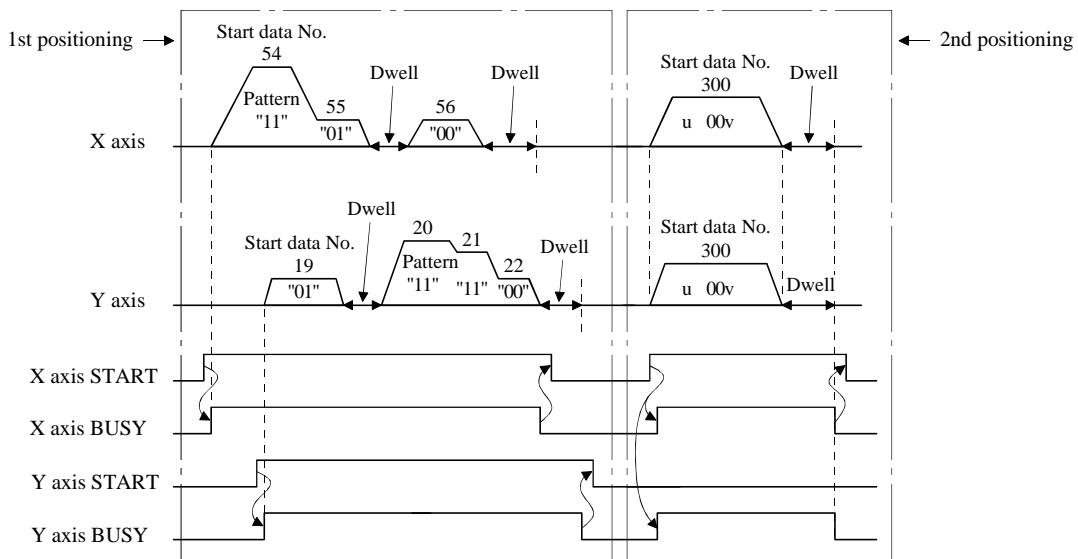
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(b) For the AD75P

(2) Speed change data

The method for this is different between the AD75P and AD71. Therefore, to change the speed for the AD75P, set a new speed value in the axis control data area and set "1" to the "Speed change request".
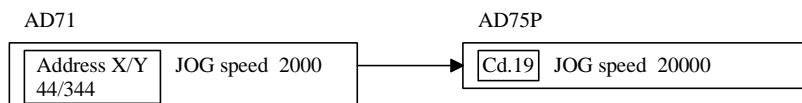
(3) New current value

The method for this is different between the AD75P and AD71. For the AD75P, set a new current value in the axis control data area and input "9003" to the positioning start No. The current value will then change after normal positioning start.

(4) JOG speed

Multiply the AD71 value by a 1000 for the unit of "mm", "inch" or "degree" or by 10 for "pulse", for the AD75P. Although the JOG start signal (Y□) device No. and the buffer memory address for the JOG speed setting are changed, the control method is not changed.

(Example)   Unit: pulse JOG speed 20000 pulse/s

AD71   AD75P

| Address X/Y 44/344 | JOG speed 2000 | → | Cd.19 | JOG speed 20000 |

(5) Manual pulse enabled

The Manual pulse enabled can be set with Cd.22 Manual pulse generator enable flag.

(6) Error reset

For the AD71, the error reset function (address 201) resets the error for both the X and Y axes simultaneously. However, for the AD75P, the error reset is set in Cd.12 for each axis independently, which is set from the ladder program.

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---

(7) Emergency stop area (for AD71S2)

To retain the emergency stop function of the AD71S2, set "1: Sudden stop" to both $\boxed{\text{Pr.39}}$ Stop group 2 sudden stop

selection and $\boxed{\text{Pr.40}}$ Stop group 3 sudden stop selection in the AD75P's detailed parameters 2.

Refer to the AD75P User's Manual, Section 5.2.4 "Detailed parameters 2" for details.

0: Normal decelerated stop 1: Sudden stop

AD71S2 stop factor	Setting on AD75P
Emergency stop triggered by external input	• Set the same time value as the AD71S2 deceleration time for emergency stop (address 7888/7908) to $\boxed{\text{Pr.37}}$ Sudden stop deceleration time. • Set "1: Sudden stop" to $\boxed{\text{Pr.40}}$ Stop group 3.
Emergency stop triggered by JOG signal OFF	• Set the same time value as the AD71S2 deceleration time for emergency stop (address 7888/7908) to $\boxed{\text{Pr.29}}$ Deceleration time. • Set "1: Deceleration time 1" to $\boxed{\text{Pr.34}}$ Jog operation deceleration time selection.

(8) Travel distance change area (for AD71S2)

Set the same value as the one in the AD71S2's travel distance change area to the AD75P $\boxed{\text{Cd.21}}$ "Speed/position

changeover control movement amount change register". Note that different methods are used for the AD71S2 and
AD75P to enable the speed/position switching. For the AD71S2 it is enabled by external input, where as for the
AD75P it is set with $\boxed{\text{Cd.20}}$ Speed/position changeover enable flag.

(9) Restart request area (for AD71S2)

The AD75P will resume the positioning from the stopped position to the positioning data end point, when "1" is set in

$\boxed{\text{Cd.13}}$ Restart Command. (It is not required to turn ON the positioning start signal Y□.)

(10) Manual pulse generator output speed (for AD71S7)

The AD71S7 manual pulse generator output speed setting is not applicable to the AD75P.
For the AD75P, the command output during the manual pulse generator operation is as follows:

[No. of command pulses]

    = (No. of input pulses of manual pulse generator) x ($\boxed{\text{Cd.23}}$ Manual pulse generator 1 pulse input magnification)

[Command frequency]

    = (Manual pulse generator input frequency) x ($\boxed{\text{Cd.23}}$ Manual pulse generator 1 pulse input magnification)

The speed during the manual pulse generator operation in the AD75P is not limited by $\boxed{\text{Pr.7}}$ Speed limit value.

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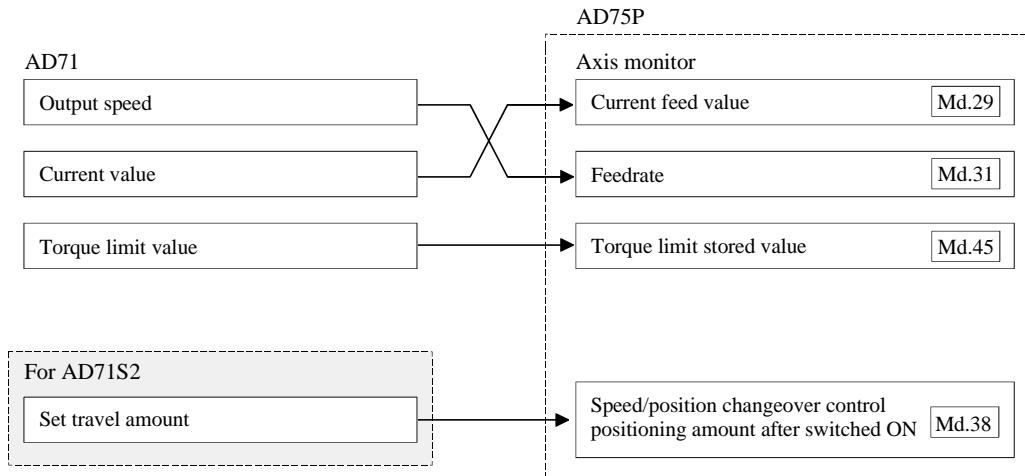
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6. OS data area (Including monitor information)
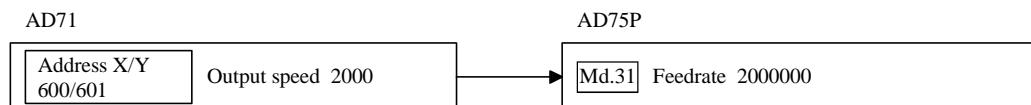
(1) Output speed

The AD71 data value is multiplied by a 1000 for the unit of "mm", "inch" or "degree" or by 10 for "pulse" for the AD75P.
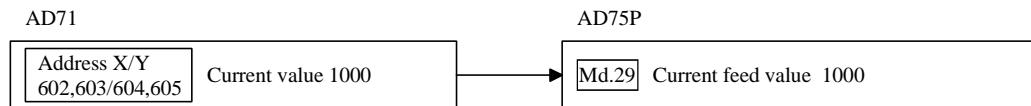
(Example)   Unit: mm
Feed rate: 20000 mm/min
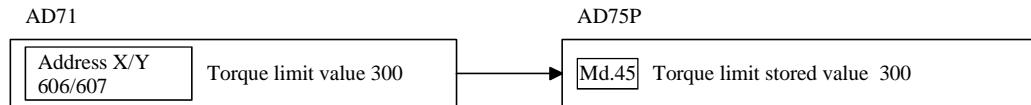
(2) Current value, Torque limit value and Set movement amount

The AD75P and AD71 stores the same values.
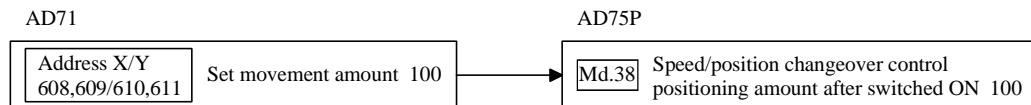
(Example)   Current value: 1000 pulses

(Example)   Torque limit value: 300%

(Example)   Set movement amount: 100 pulses

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[Relevant Models] A1SD75P☐-S3/AD75P☐-S3

7. Positioning control program

7.1 Differences in I/O signals

AD71	AD75P
Watchdog timer error (X0)	No watchdog timer error signal is provided. When a watchdog timer error occurs, AD75 Ready (X0) turns ON.
Zero point return request (X6, X7)	The status can be checked in $\boxed{\text{Md.40}}$ Zero point return request flag (Bit 3). "1" is shown, when the zero point return is requested.
Battery error (XA)	No battery error signal is provided. Batteries are not required for memory backup because data is stored in the flash ROM.
Error detection (XB) For both X and Y axes	Error detection is available for each axis independently. Axis 1: XA, Axis 2: XB
Zero point return complete (XC, XD)	The status can be checked in $\boxed{\text{Md.40}}$ Zero point return request flag (Bit 3). "1" is shown, when the zero point return is completed.
Interpolation positioning start (Y12)	No interpolation start signal is provided. Setting interpolation to positioning data and executing positioning start enables interpolation.
Zero point return start (Y13, Y14)	No zero point return start signal is provided. Writing "9001" to $\boxed{\text{Cd.11}}$ Positioning start No. and starting positioning start will execute zero point return.
M code OFF (Y1B, Y1C)	$\boxed{\text{Cd.14}}$ M code OFF request is used. Writing "1" turns M code OFF.

For details on the AD75P I/O signals, refer to the AD75P User's Manual.

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7.2 Precautions for replacing AD71 with AD75P

When programming, pay attention to the fact that the AD75P is different from the AD71 in I/O numbers for I/O signals and buffer memory addresses. Precautions for other than these differences are shown in the "Points for replacement" column below.

	Item	AD71	AD75P	Points for replacement
Setup	PLC ready	Y1D is turned ON with the sequence program.	Same as AD71	–
Setup	Ready status confirmation	When AD71 is ready, X1 toggles to ON.	When AD75P is ready, X0 toggles to OFF.	Operation ready status of X device is ON for AD71 and OFF for AD75P.
	JOG operation	JOG speed is set in the buffer memory. Turning ON or OFF the forward/ reverse JOG start (Y□) starts or stops JOG operation accordingly.	Same as AD71	–
	Zero point return	Zero point return is started when the zero point return signal (Y□) is turned ON for each axis. The operation depends on parameter setting of zero point return data.	The same method as positioning start is used (ladder program). Writing "9001" to Cd.11 Positioning start No. and turning ON the positioning start signal (Y□) starts zero point return. The operation depends on the parameter setting of zero point return data.	There is no zero point return signal (Y□) for AD75P. Writing "9001" to Cd.11 Positioning start No. and turning ON the positioning start signal (Y□) starts zero point return.
	Positioning operation	Positioning is started after writing the positioning data No. to the start data No. area in the buffer memory, and turning ON the start signal (Y□) for each axis. The start signal (Y□) for interpolation is provided separately.	Positioning is started after writing the positioning data No. to Cd.11 "Positioning start No". in the buffer memory, and then turning ON the start signal (Y□) for each axis. Also, as the AD75P does not have an interpolation start signal (Y□) same as AD71, interpolation operation has to be set in the positioning data.	To start interpolation, the operation must be specified in the positioning data.
	Speed change	Write a new speed value in the speed change data area (buffer memory address 40/340).	Write a new speed value to Cd.16 "New speed value" in the buffer memory and set "1" to Cd.19 JOG speed.	Setting "1" in Cd.19 "Speed change request" is required to execute this function.
	Current value change	Write a new current data value in the current value change data area (buffer memory address 41,42/341,342).	Write a new current data value to Cd.15 "New current value" in the buffer memory and "9003" to Cd.11 "Positioning start No." and then, turn ON the positioning start signal (Y□).	Writing "9003" to Cd.11 "Positioning start No". and turning ON the positioning start signal (Y□) is required.
	Restart	If positioning stops temporarily, turn ON the positioning start signal (Y□) to restart. However, for the increment system, restart is not supported. In the absolute system, when stopped, restart is supported if the current positioning data No. is set. When the operation stops unexpectedly during the control switch in the speed/positioning control switching mode. Restart can be done by setting "1" to Restart area (Buffer memory address: 205/505) and turning ON the positioning start signal (Y□).	Setting "1" to Cd.13 "Restart command" after a temporary stop restarts the positioning. For the absolute and increment systems, the restart command can be used. In the absolute system, when stopped, set the current positioning data No. to Cd.11 "Positioning start No." and turn ON the positioning start signal (Y□) to restart positioning.	Setting "1" to Cd.13 "Restart command" restarts positioning in the AD75P.

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Item	AD71	AD75P	Points for replacement
Data backup method	Contents of the buffer memory are always backed up. The operation after power-on or PLC CPU reset is based on the backed-up memory data.	Parameters, positioning data and positioning start information in the buffer memory are written to flash ROM for backup by setting "1" to Cd.9 Flash ROM write request. (The No. of flash ROM write: Up to 100000) At the time of power-on or PLC CPU reset, the flash ROM data are transferred to the buffer memory. (For details, refer to Section 7.3.) Note that the same procedures as AD71 is taken at power-on or PLC CPU reset when the data has been written to the buffer memory with the ladder program.	To back up data, "1" must be set in Cd.9 "Flash ROM write request". The max number of flash ROM writes is 100000 times.

7.3 Programming restrictions

(1) Restrictions on number of FROM/TO instructions in 1 scan

The number of FROM/TO and DFRO/DTO instructions (for 16- and 32-bit data transfer respectively) that can be executed in one scan is shown below:

(a) For a 1- or 2-axis module, up to 10 FROM/TO or DFRO/DTO instructions are executable for each axis.

(b) For a 3-axis module, the number of the FROM/TO and DFRO/DTO instructions varies depending on the functions executed.
- In the circular interpolation control or S-pattern acceleration/deceleration: 4 times/axis
- Simultaneous CHG input to 2 axes in speed/position changeover control: 4 times/axis
- Other than the above: 10 times/axis

	Circular interpolation control	S-pattern acceleration/ deceleration	Speed/position changeover control (Simultaneous CHG input to 2 axes)	Control other than the left
A1SD75P1-S3 AD75P1-S3	10 times/axis	10 times/axis	10 times/axis	10 times/axis
A1SD75P2-S3 AD75P2-S3	10 times/axis	10 times/axis	10 times/axis	10 times/axis
A1SD75P3-S3 AD75P3-S3	4 times/axis	4 times/axis	4 times/axis	10 times/axis

(2) Restrictions on speed change intervals

For the AD75P, the speed change must be executed in intervals of 100ms or more.

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7.4 Ladder program examples for AD75P

This section provides some basic program examples for the AD75P positioning control. When creating programs for the AD75P, refer to the following examples and compare them with those in the AD71.
(The program examples represent the case in which the AD75P is mounted in slot 0 of the main base unit.)
For controls other than those shown as the examples, refer to the AD75P User's Manual.
When using the peripheral software package for the AD75P to create data, the following parameter setting program and the positioning data setting program are not required.

(1) Parameter setting

```
*
*  Parameter setting program
*  (For basic parameter 1 axis 1)
*
   M9038
    ─┤├──┬────────────────────────[MOVP   K0      D50    ]   <Setting of unit setting (0:mm)>
         │
         ├────────────────────────[MOVP   K1      D51    ]   <Setting of No. of pulses per rotation>
         │
         ├────────────────────────[MOVP   K1      D52    ]   <Setting of movement amount per rotation>
         │
         ├────────────────────────[MOVP   K1      D53    ]   <Setting of unit magnification (1-fold)>
         │
         ├────────────────────────[MOVP   K1      D54    ]   <Setting of pulse output mode (cw/ccw)>
         │
         ├────────────────────────[MOVP   K0      D55    ]   <Setting of rotation direction
         │                                                     (forward rotation for increment)>
         │
         └──────────────[TOP   H0   K0   D50   K6   ]   <Setting of basic parameters 1 to AD75>
```

(2) Positioning data setting

```
*
*  No.2 Positioning data setting program
*  (For positioning data No.1 axis 1)
*  <Positioning identifier>
*   Operation pattern : Positioning complete
*   Control method : 1-axis liner control (ABS)
*   Acceleration time No.:1, Deceleration time No.:2
*
   M9038
    ─┤├──┬────────────────────────[MOVP    H190     D56   ]   <Setting of positioning identifier>
         │
         ├────────────────────────[MOVP    K9843    D57   ]   <Setting of M code (9843)>
         │
         ├────────────────────────[MOVP    K300     D58   ]   <Setting of dwell time (300ms)>
         │
         ├────────────────────────[MOVP    K0       D59   ]   < (Dummy data) >
         │
         ├────────────────────────[DMOVP   K18000   D60   ]   <Setting of command speed (180.00mm/min)>
         │
         ├────────────────────────[DMOVP   K4126    D62   ]   <Positioning address (412.6µm) setting>
         │
         ├────────────────────────[DMOVP   K0       D64   ]   <Setting arc address (0.0µm)>
         │
         └──────────────[TOP   H0   K1300   D56   K10   ]   <Setting of positioning data No.1 to AD75>
```

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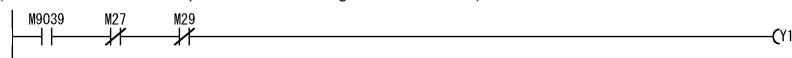
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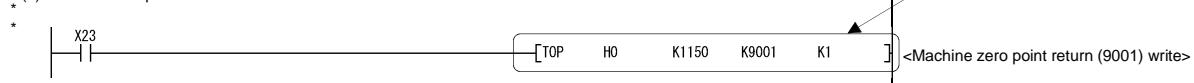
(3) Positioning program

```
*
* PLC READY signal [Y1D] ON program
* (The M27 contact is not required when the parameters are not be initialized.)
* (The M29 contact is not required when not writing to the flash ROM.)
*
    M9039   M27   M29
     ─┤├──────┤╱├───┤╱├───────────────────────────────(Y1D    )   <PLC READY signal ON/OFF>


*
* Positioning start No. setting program
*
* (1) Machine zero point return                                              Point
*
    X23
     ─┤├──────────────────────[TOP    H0    K1150    K9001    K1 ]   <Machine zero point return (9001) write>


*
* (2) Positioning with positioning data No.1 (Control other than speed/position changeover control)
*
    X25
     ─┤├──────────────────────────────────[MOVP    K1    D7 ]   <Positioning data No.1 setting>

                    ──────────────────[TOP    H0    K1150    D7    K1 ]   <Positioning data No. write>


*
* (3) Positioning with positioning data No.1 (Speed/position changeover control)
*
    X26
     ─┤├──────────────────────────────────[MOVP    K1    D7 ]   <Positioning data No.1 setting>

                    ──────────────────[TOP    H0    K1150    D7    K1 ]   <Positioning data No.1 write>
    X27
     ─┤├──────────────────[TOP    H0    K1163    K1    K1 ]   <Speed/position changeover signal enable setting>
    X28
     ─┤├──────────────────[TOP    H0    K1163    K0    K1 ]   <Speed/position changeover signal prohibit setting>
    X29
     ─┤├──────────────────────────────────[DMOVP    K10000    D8 ]   <New movement amount write>

                    ──────────────────[DTOP    H0    K1164    D8    K1 ]


*
* Positioning start signal input program
*    (When high-speed zero point return is not made, contacts of M5 and M6 are not needed.)
*    (When M code is not used, contact of X0D is not needed.)
*    (When JOG operation is not performed, contact of M9 is not needed.)
*    (When manual pulse generator operation is not performed, contact of M11 is not needed.)
*
    X2B
     ─┤├────────────────────────────────────────────[PLS    M7 ]   <Positioning start command pulse>

    M7    Y10    X0    X1    X0D    M9    M11    M6
     ─┤├──┤╱├──┤╱├──┤╱├──┤╱├──┤╱├──┤╱├──┬┤╱├──────[SET    M8 ]   <Positioning start command hold>
                Point                │
                                    M5    M6
                                    ─┤├──┤├──┘

    M8
     ─┤├────────────────────────────────────────────[SET    Y10 ]   <Positioning start execution>

                    ────────────────────────────────[RST    M8 ]   <Positioning start command storage OFF>
```
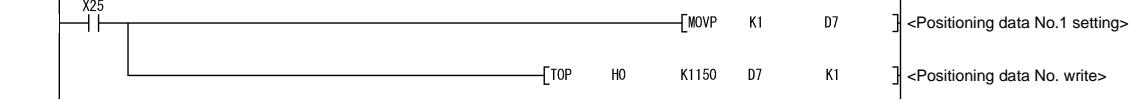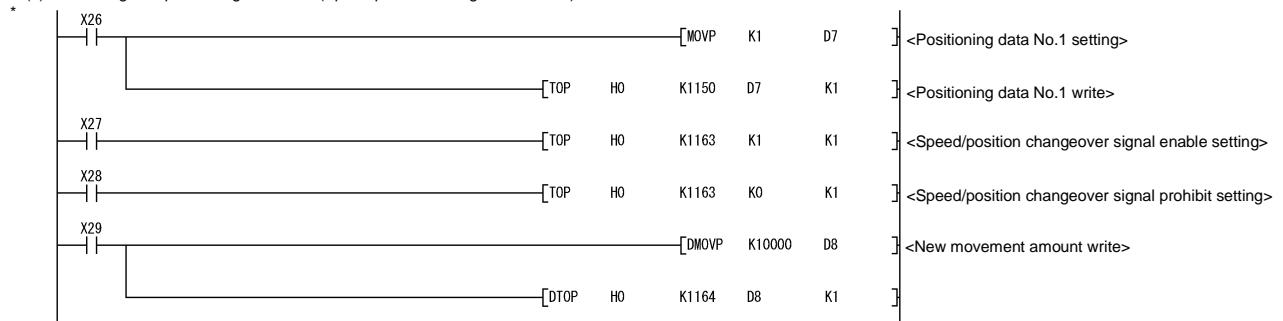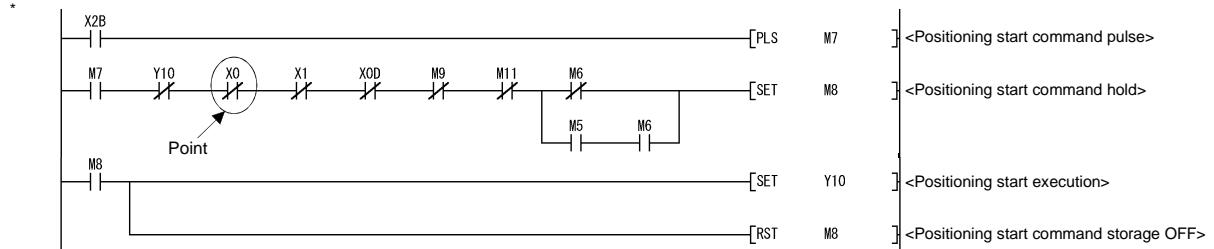
TECHNICAL BULLETIN
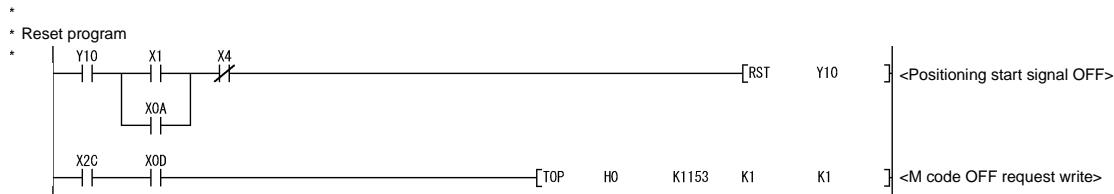
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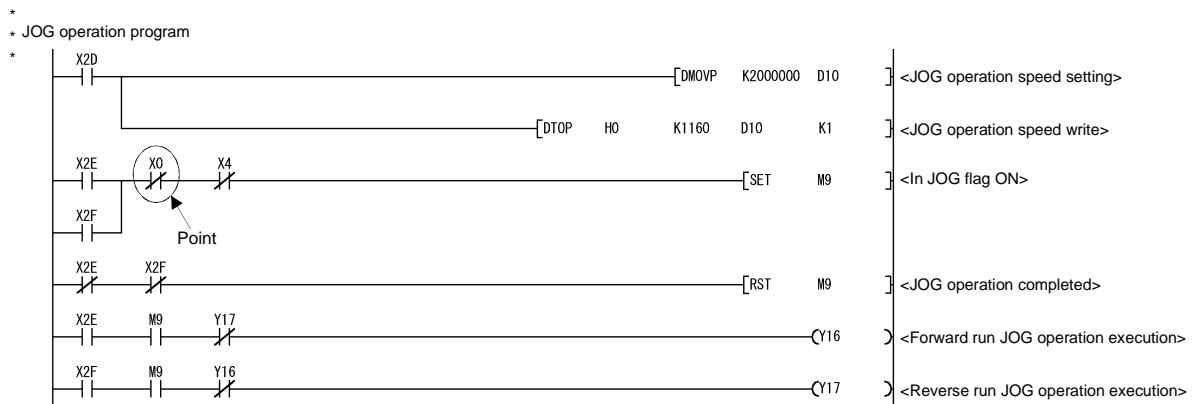
[Relevant Models] A1SD75P□-S3/AD75P□-S3

(4) Reset program

```
*
* Reset program
*
   Y10   X1   X4                                    [RST   Y10  ]   <Positioning start signal OFF>
   ┤├──┬─┤├──┤/├                                
       │
       X0A
      ─┤├─

   X2C   X0D                             [TOP  H0  K1153  K1   K1 ]   <M code OFF request write>
   ┤├───┤├
```

(5) JOG operation program

```
*
* JOG operation program
*
   X2D                                        [DMOVP  K2000000  D10 ]   <JOG operation speed setting>
   ┤├──┬
       │
       └───────────────────────[DTOP  H0  K1160  D10  K1 ]   <JOG operation speed write>

   X2E   X0   X4                                    [SET   M9  ]   <In JOG flag ON>
   ┤├──┤/├──┤/├
   X2F        Point
   ┤├

   X2E   X2F                                        [RST   M9  ]   <JOG operation completed>
   ┤/├──┤/├

   X2E   M9   Y17                                       (Y16 )   <Forward run JOG operation execution>
   ┤├──┤├──┤/├

   X2F   M9   Y16                                       (Y17 )   <Reverse run JOG operation execution>
   ┤├──┤├──┤/├
```

(6) Manual pulse generator operation program

```
*
* Manual pulse generator operation program
*
   X30                                              [PLS   M10 ]   <Manual pulse generator operation command pulse>
   ┤├

   M10   X0   X4                               [DMOVP  K1  D12 ]   <Manual pulse generator 1 pulse input magnification setting>
   ┤├──┤/├──┤/├──┬
         Point   │
                 ├──────────[DTOP  H0  K1168  D12  K1 ]   <Manual pulse generator 1 pulse input magnification write>
                 │
                 ├──────────[TOP  H0  K1167  K1   K1 ]   <Manual pulse generator operation enable write>
                 │
                 └──────────────────────────[SET   M11 ]   <Manual pulse generator operating flag ON>

   X31                                              [PLS   M12 ]   <Manual pulse generator operation disable command pulse>
   ┤├

   M12   M11   X4                         [TOP  H0  K1167  K0   K1 ]   <Manual pulse generator operation disable write>
   ┤├──┤├──┤/├──┬
                │
                └──────────────────────────[RST   M11 ]   <Manual pulse generator operating flag OFF>
```
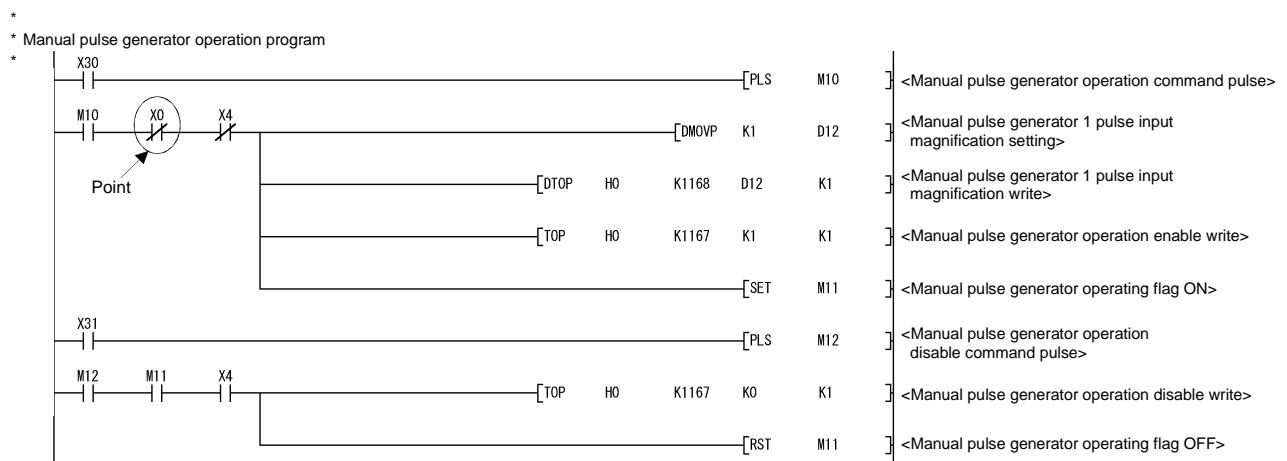
TECHNICAL BULLETIN
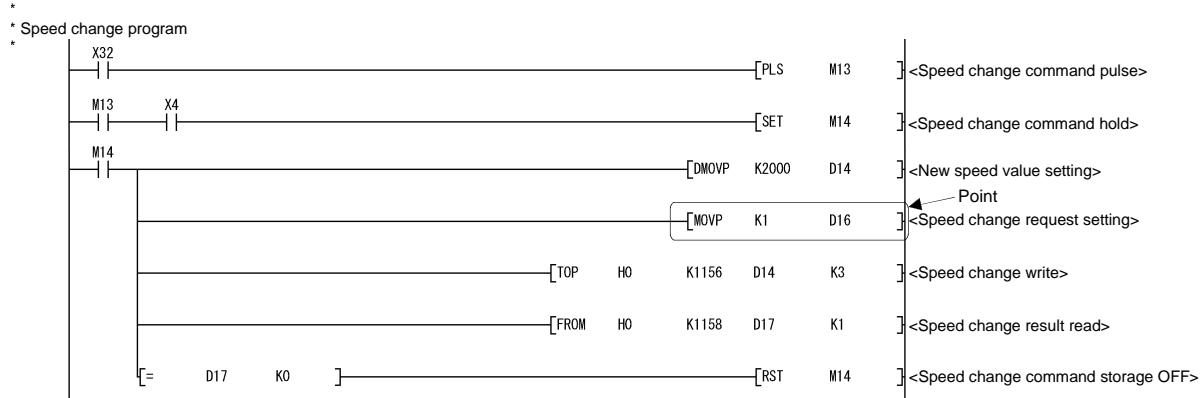
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[Relevant Models] A1SD75P□-S3/AD75P□-S3

(7) Speed change program

```
*
* Speed change program
*
  X32
  ─┤├──────────────────────────────────────────────[PLS    M13  ]  <Speed change command pulse>

  M13    X4
  ─┤├────┤├──────────────────────────────────────────[SET    M14  ]  <Speed change command hold>

  M14
  ─┤├──────────────────────────────────[DMOVP  K2000  D14  ]  <New speed value setting>
    │                                                              ─── Point
    │                                    [MOVP   K1     D16  ]  <Speed change request setting>
    │
    │                        [TOP    H0    K1156   D14   K3  ]  <Speed change write>
    │
    │                        [FROM   H0    K1158   D17   K1  ]  <Speed change result read>
    │
    └──[=  D17  K0  ]──────────────────────────────────[RST    M14  ]  <Speed change command storage OFF>
```
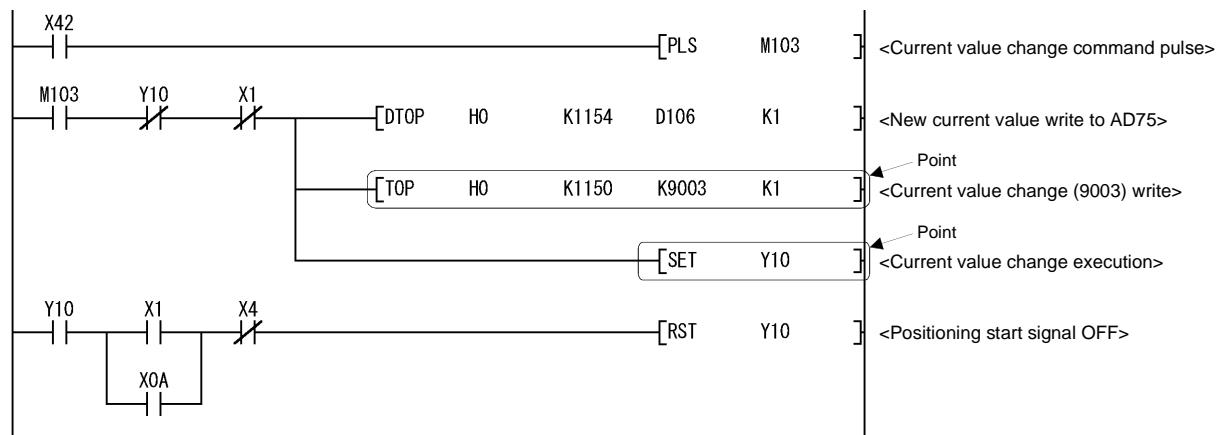
(8) Current value change program

```
*
* Current value change program
*
* ............................................................
*         Store new current feed value in D106 and D107
* ............................................................
*
*
  X42
  ─┤├──────────────────────────────────────────────[PLS    M103 ]  <Current value change command pulse>

  M103   Y10    X1
  ─┤├────┤╱├───┤╱├───┬──[DTOP   H0    K1154   D106   K1  ]  <New current value write to AD75>
                     │                                        ─── Point
                     ├──[TOP    H0    K1150   K9003   K1  ]  <Current value change (9003) write>
                     │                                        ─── Point
                     └──────────────────────[SET    Y10  ]  <Current value change execution>

  Y10    X1    X4
  ─┤├────┤├───┤╱├──────────────────────────[RST    Y10  ]  <Positioning start signal OFF>
    │
   X0A
  ─┤├─
```

```
┌─────────────────────────────────────────────────────┐
│  X1            : Start complete signal                │
│  X4            : BUSY signal                          │
│  XA            : Error detection signal               │
│  X42           : Current value change command         │
│  Y10           : Positioning start signal             │
│  M103          : Current value change command pulse   │
│  D106, D107    : New current value                    │
└─────────────────────────────────────────────────────┘
```

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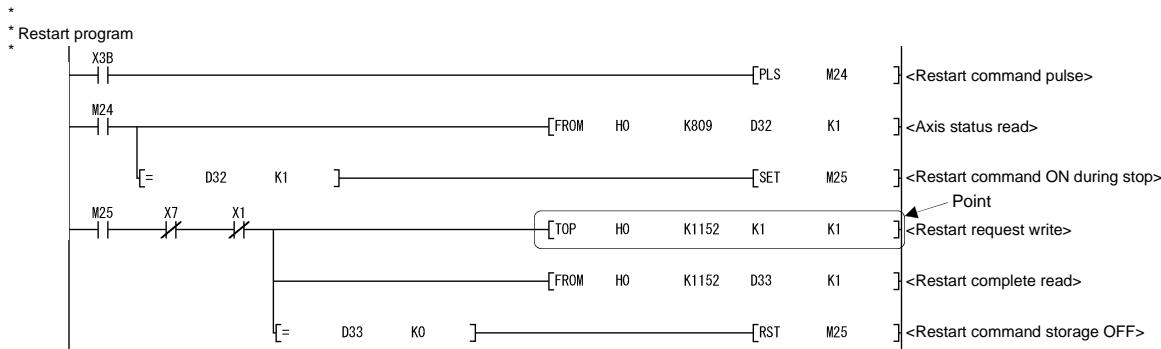
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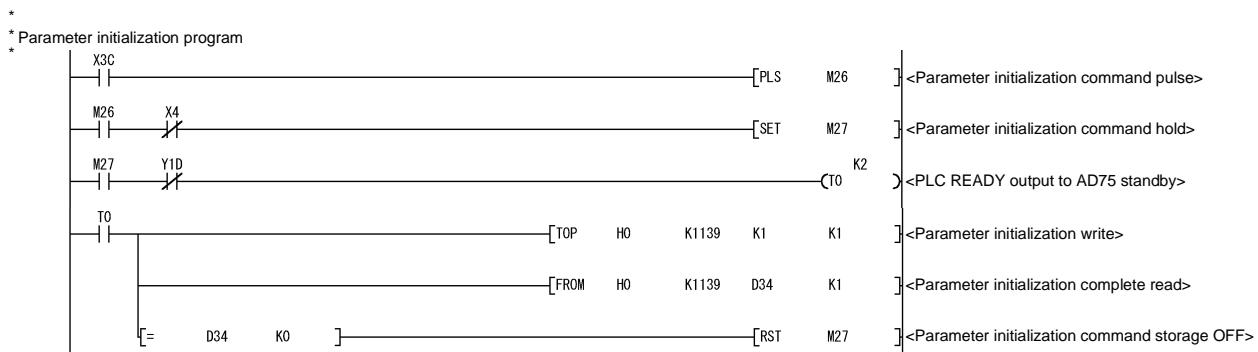
[Relevant Models] A1SD75P□-S3/AD75P□-S3

(9) Restart program

```
*
* Restart program
*
  X3B
──┤├──────────────────────────────────────────────[PLS    M24  ]  <Restart command pulse>

  M24
──┤├────────────────────────────[FROM   H0    K809   D32    K1 ]  <Axis status read>

      [= D32  K1 ]──────────────────────────────────[SET    M25  ]  <Restart command ON during stop>
                                                                        ↙ Point
  M25  X7   X1
──┤├──┤╱├──┤╱├────────────┌──────[TOP    H0    K1152  K1    K1 ]  <Restart request write>
                          │
                          ├──────[FROM   H0    K1152  D33    K1 ]  <Restart complete read>
                          │
      [= D33  K0 ]────────┘──────────────────────────[RST    M25  ]  <Restart command storage OFF>
```

(10) Parameter initialization program

```
*
* Parameter initialization program
*
  X3C
──┤├──────────────────────────────────────────────[PLS    M26  ]  <Parameter initialization command pulse>

  M26  X4
──┤├──┤╱├──────────────────────────────────────────[SET    M27  ]  <Parameter initialization command hold>

  M27  Y1D                                                    K2
──┤├──┤╱├────────────────────────────────────────────────(T0    )  <PLC READY output to AD75 standby>

  T0
──┤├─────────────────────┌────────[TOP    H0    K1139  K1    K1 ]  <Parameter initialization write>
                         │
                         ├────────[FROM   H0    K1139  D34    K1 ]  <Parameter initialization complete read>
                         │
      [= D34  K0 ]───────┘──────────────────────────[RST    M27  ]  <Parameter initialization command storage OFF>
```

(11) Flash ROM write program

```
*
* Flash ROM write program
*
  X3D
──┤├──────────────────────────────────────────────[PLS    M28  ]  <Flash ROM write command pulse>

  M28  X4
──┤├──┤╱├──────────────────────────────────────────[SET    M29  ]  <Flash ROM write command hold>

  M29  Y1D                                                    K2
──┤├──┤╱├────────────────────────────────────────────────(T1    )  <PLC READY output to AD75 standby>
                                                                        ↙ Point
  T1
──┤├─────────────────┌────────────[TOP    H0    K1138  K1    K1 ]  <Flash ROM write request write>
                     │
                     ├────────────[FROM   H0    K1138  D35    K1 ]  <Flash ROM write complete read>
                     │
      [= D35  K0 ]───┘──────────────────────────────[RST    M29  ]  <Flash ROM write command storage OFF>
```
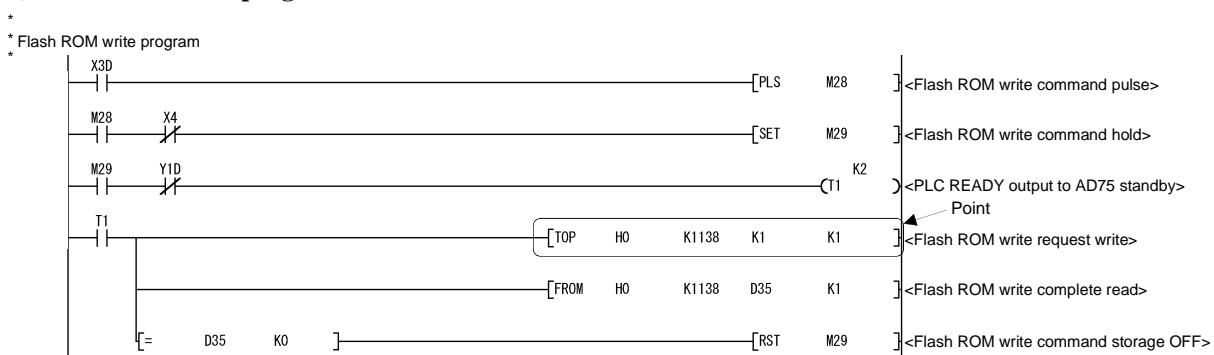
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[Relevant Models] A1SD75P□-S3/AD75P□-S3

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(12) Error reset program

```
*
* Error reset program
*
     X0A    M30
     ─┤├────┤/├──────────────────────────────────[FROM   H0    K807   D36    K1  ]   <Error code read>

                  ┌[<>    D36    K0  ]────────────────────────[SET    M30 ]        <Error code read complete confirmation>

     X3E
     ─┤├───────────────────────────────────────────────────[PLS    M31 ]        <Error reset command pulse>

     M31    X0A
     ─┤├────┤/├──────────────────────────[TOP   H0    K1151   K1    K1  ]        <Error reset execution>

     M30    X0A
     ─┤├────┤/├────────────────────────────────────────────[RST    M30 ]        <Error code read complete OFF>
```

(13) Stop program

```
*
* Stop program
*
     X3F
     ─┤├───────────────────────────────────────────────────[PLS    M32 ]        <Stop command pulse>

     M32    X4
     ─┤├────┤├─────────────────────────────────────────────[SET    Y13 ]        <Stop execution>

     X3F    X4
     ─┤/├───┤/├────────────────────────────────────────────[RST    Y13 ]        <Axis stop signal OFF due to axis stop>

                                                            ──────────[END ]
```

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[Title] Procedures for Replacing Positioning Module   **[Date of Issue** Oct., '03
     AD71 with AD75P

[Relevant Models] A1SD75P□-S3/AD75P□-S3

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8. AD75P operation test

Once the connection of the relevant signals, and the creation of ladder programs are completed, perform an operation test for start-up of the positioning system using the AD75P.

(1) 17-segment display check on AD75P module

Turn on the PLC and check the following 17-segment display on the AD75P module when the program is in run.
(a) IDLE: The AD75P has started normally.
(b) E***: An error has occurred in the AD75P.
     Check the error details from the error code and fault-find the cause of the error.

(2) Check for "Ready ON" and "Servo ON"

After confirming the AD75P has started normally, turn on the PLC ready signal, power on the servo amplifier and verify the servo amplifier has started up without any error.

(3) Operation check by JOG operation

Perform the JOG operation using the JOG operation program of the positioning control programs, and check that the motor functions correctly according to the commands set.
Normal JOG operation means that the control of the AD75P and the driver (servo amplifier) is normal.

(4) Operation check of positioning system

Start the programs for zero point return and positioning and check for normal control.

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[Title] Procedures for Replacing Positioning Module
  AD71 with AD75P **[Date of Issue** Oct., '03

[Relevant Models] A1SD75P□-S3/AD75P□-S3

Appendix   Tables of AD75P buffer memory addresses

The following is the buffer memory addresses shown in this bulletin.

(1) Parameter Pr

Buffer memory address		Item	Memory area	
Axis 1	Axis 2			
0	150	Pr.1 Unit setting	Basic parameters 1	Positioning parameters
1	151	Pr.2 No. of pulses per rotation (Ap)		
2	152	Pr.3 Movement amount per rotation (Al)		
3	153	Pr.4 Unit magnification (Am)		
4	154	Pr.5 Pulse output mode		
5	155	Pr.6 Rotation direction setting		
6 7	156 157	Pr.7 Speed limit value	Basic parameters 2	
8 9	158 159	Pr.8 Acceleration time 0		
10 11	160 161	Pr.9 Deceleration time 0		
12 13	162 163	Pr.10 Bias speed at start		
14	164	Pr.11 Stepping motor mode selection		
15	165	Pr.12 Backlash compensation amount	Detailed parameters 1	
16 17	166 167	Pr.13 Software stroke limit upper limit value		
18 19	168 169	Pr.14 Software stroke limit lower limit value		
20	170	Pr.15 Software stroke limit selection		
21	171	Pr.16 Software stroke limit valid/invalid setting		
22 23	172 173	Pr.17 Command in-position width		
24	174	Pr.18 Torque limit setting value		
25	175	Pr.19 M code ON signal output timing		
26	176	Pr.20 Speed changeover mode		
27	177	Pr.21 Interpolation speed designation method		
28	178	Pr.22 Current feed value during speed control		
29	179	Pr.23 Manual pulse generator selection		
30	180	Pr.24 Logic selection for pulse output to the drive unit		
31	181	Pr.25 Size selection for acceleration/deceleration time		
36 37	186 187	Pr.26 Acceleration time 1	Detailed parameters 2	
38 39	188 189	Pr.27 Acceleration time 2		
40 41	190 191	Pr.28 Acceleration time 3		
42 43	192 193	Pr.29 Deceleration time 1		

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[Relevant Models] A1SD75P□-S3/AD75P□-S3

Buffer memory address		Item	Memory area	
Axis 1	Axis 2			
44 45	194 195	Pr.30 Deceleration time 2	Detailed parameters 2	Positioning parameters
46 47	196 197	Pr.31 Deceleration time 3		
48 49	198 199	Pr.32 JOG speed limit value		
50	200	Pr.33 JOG operation acceleration time selection		
51	201	Pr.34 JOG operation deceleration time selection		
52	202	Pr.35 Acceleration/deceleration process selection		
53	203	Pr.36 S-pattern proportion		
54 55	204 205	Pr.37 Sudden stop deceleration time		
56	206	Pr.38 Stop group 1 sudden stop selection		
57	207	Pr.39 Stop group 2 sudden stop selection		
58	208	Pr.40 Stop group 3 sudden stop selection		
59	209	Pr.41 Positioning complete signal output time		
60 61	210 211	Pr.42 Allowable circular interpolation error width		
62	212	Pr.43 External start function selection		
66	216	Pr.44 Near pass mode selection for path control		
70	220	Pr.45 Zero point return method	Zero point return basic parameters	Zero point return parameters
71	221	Pr.46 Zero point return direction		
72 73	222 223	Pr.47 Zero point address		
74 75	224 225	Pr.48 Zero point return speed		
76 77	226 227	Pr.49 Creep speed		
78	228	Pr.50 Zero point return retry		
79	229	Pr.51 Zero point return dwell time	Zero point return detailed parameters	
80 81	230 231	Pr.52 Setting for the movement amount after near-point dog ON		
82	232	Pr.53 Zero point return acceleration time selection		
83	233	Pr.54 Zero point return deceleration time selection		
84 85	234 235	Pr.55 Zero point shift amount		
86	236	Pr.56 Zero point return torque limit value		
88	238	Pr.57 Speed designation during zero point shift		
89	239	Pr.58 Dwell time during zero point return retry		

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(2) Monitor data Md

Buffer memory address Common for axis 1 and axis 2	Item	Memory area
450	Md.1 In test mode flag	
451	Md.2 Module name	
452 453 454 455	Md.3 OS type	
456 457	Md.4 OS version	
460	Md.5 Clock data (hour: minute)	
461	Md.6 Clock data (second: 100 ms)	

(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(pointer No.)	
462	467	472	477	482	487	492	497	502	507	512	517	522	527	532	537	Md.7 Start axis	Start history / System monitor data / Monitor data
463	468	473	478	483	488	493	498	503	508	513	518	523	528	533	538	Md.8 Operation type	
464	469	474	479	484	489	494	499	504	509	514	519	524	529	534	539	Md.9 Start time (Hour: minut)	
465	470	475	480	485	490	495	500	505	510	515	520	525	530	535	540	Md.10 Start time (Second: 100 ms)	
466	471	476	481	486	491	496	501	506	511	516	521	526	531	536	541	Md.11 Error judgment	
542																Md.12 Start history pointer	

(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(pointer No.)	
533	548	553	558	563	568	573	578	583	588	593	598	603	608	613	618	Md.13 Start axis	Start history during errors
534	549	554	559	564	569	574	579	584	589	594	599	604	609	614	619	Md.14 Operation type	
535	550	555	560	565	570	575	580	585	590	595	600	605	610	615	620	Md.15 Start time (Hour: minut)	
536	551	556	561	566	571	576	581	586	591	596	601	606	611	616	621	Md.16 Start time (Second: 100 ms)	
537	552	557	562	567	572	577	582	587	592	597	602	607	612	617	622	Md.17 Error judgment	
623																Md.18 Start history pointer at error	

(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(pointer No.)	
624	628	632	636	640	644	648	652	656	660	664	668	672	676	680	684	Md.19 Axis in which the error occurred	Error history
625	629	633	637	641	645	649	653	657	661	665	669	673	677	681	685	Md.20 Axis error No.	
626	630	634	638	642	646	650	654	658	662	666	670	674	678	682	686	Md.21 Axis error occurrence time (Hour: minute)	
627	631	635	639	643	647	651	655	659	663	667	671	675	679	683	687	Md.22 Axis error occurrence time (Second: 100ms)	
688																Md.23 Error history pointer	

(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(pointer No.)	
689	693	697	701	705	709	713	717	721	725	729	733	737	741	745	749	Md.24 Axis in which the warning occurred	Warning history
690	694	698	702	706	710	714	718	722	726	730	734	738	742	746	750	Md.25 Axis warning No.	
691	695	699	703	707	711	715	719	723	727	731	735	739	743	747	751	Md.26 Axis warning occurrence time (Hour: minute)	
692	696	700	704	708	712	716	720	724	728	732	736	740	744	748	752	Md.27 Axis warning occurrence time (Second: 100ms)	
753																Md.28 Warning history pointer	

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Buffer memory address		Item		Memory area	
Axis 1	Axis 2				
800 801	900 901	Md.29	Current feed value		
802 803	902 903	Md.30	Machine feed value		
804 805	904 905	Md.31	Feedrate		
806	906	Md.32	Valid M code		
807	907	Md.33	Axis error No.		
808	908	Md.34	Axis warning No.		
809	909	Md.35	Axis operation status		
810	910	Md.36	Current speed		
812 813	912 913	Md.37	Axis feedrate		
814 815	914 915	Md.38	Speed/position changeover control positioning amount		
816	916	Md.39	External input/output signal		
817	917	Md.40	Status		
818 819	918 919	Md.41	Target value		
820 821	920 921	Md.42	Target speed		
822 823	922 923	Md.43	Zero point absolute position	Axis monitor data	Monitor data
824 825	924 925	Md.44	Movement amount after near-point dog ON		
826	926	Md.45	Torque limit stored value		
827	927	Md.46	Special start data command code setting value		
828	928	Md.47	Special start data command parameter setting value		
829	929	Md.48	Start positioning data No. setting value		
830	930	Md.49	In speed limit flag		
831	931	Md.50	In speed change processing flag		
832	932	Md.51	Start data pointer being executed		
833	933	Md.52	Last executed positioning data No.		
834	934	Md.53	Repeat counter		
835	935	Md.54	Positioning data No. being executed		
836	936	Md.55	Block No. being executed		
838 to 847	938 to 947	Md.56	Positioning data being executed		

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(3) Control data Cd

Buffer memory address		Item	Memory area	
Axis 1	Axis 2			
1100		Cd.1 Clock data setting (hour)	System control data	
1101		Cd.2 Clock data setting (minute, second)		
1102		Cd.3 Clock data writing		
1103		Cd.4 Target axis		
1104		Cd.5 Positioning data No.		
1105		Cd.6 Write pattern		
1106		Cd.7 Read/write request		
1108 to 1137		Cd.8 Read/write positioning data I/F		
1138		Cd.9 Flash ROM write request		
1139		Cd.10 Parameter initialization request		
1150	1200	Cd.11 Positioning start No.	Axis control data	Control data
1151	1201	Cd.12 Axis error reset		
1152	1202	Cd.13 Restart command		
1153	1203	Cd.14 M code OFF request		
1154 1155	1204 1205	Cd.15 New current value		
1156 1157	1206 1207	Cd.16 New speed value		
1158	1208	Cd.17 Speed change request		
1159	1209	Cd.18 Positioning operation speed override		
1160 1161	1210 1211	Cd.19 JOG speed		
1163	1213	Cd.20 Speed/position changeover enable flag		
1164 1165	1214 1215	Cd.21 Speed/position changeover control movement amount change register		
1167	1217	Cd.22 Manual pulse generator enable flag		
1168 1169	1218 1219	Cd.23 Manual pulse generator 1 pulse input magnification		
1170	1220	Cd.24 Zero point return request flag OFF request		
1171	1221	Cd.25 External start valid		
1172	1222	Cd.26 Step valid flag		
1173	1223	Cd.27 Step mode		
1174	1224	Cd.28 Step start information		
1175	1225	Cd.29 Skip command		
1176	1226	Cd.30 New torque value		
1178	1228	Cd.31 Positioning starting point No.		
1181	1231	Cd.32 Interrupt request during continuous operation		
1184 1185	1234 1235	Cd.33 New acceleration time value		
1186 1187	1236 1237	Cd.34 New deceleration time value		
1188	1238	Cd.35 Acceleration/deceleration time change during speed change, enable/disable selection		

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(4) **Positioning data** Da

Buffer memory address				Item		Memory area	
Axis 1		Axis 2					
1300		2300		Da.1 Operation pattern	No.1	Positioning data	Positioning data
				Da.2 Control method			
				Da.3 Acceleration time No.			
				Da.4 Deceleration time No.			
1301		2301		Da.9 M code/condition data			
1302		2302		Da.8 Dwell time/JUMP destination positioning data No.			
1303		2303		Not used			
1304 1305		2304 2305		Da.7 Command speed			
1306 1307		2306 2307		Da.5 Positioning address/movement amount			
1308 1309		2308 2309		Da.6 Arc address			
1310 to 1319		2310 to 1219		No. 2			
1320 to 1329		2320 to 2329		No. 3			
↓		↓		↓			
2290 to 2299		3290 to 3299		No. 100			
4300	4350	4550	4600	Da.10 Shape	1st point	Start block data	
				Da.11 Start data No.			
				Da.12 Special start command			
				Da.13 Parameter			
4301	4351	4551	4601	2nd point			
4302	4352	4552	4602	3rd point			
↓		↓		↓			
4349	4399	4599	4649	50th point			
4400		4650		Da.14 Condition target	1st item	Condition data	Positioning start information
				Da.15 Condition operator			
4402 4403		4652 4653		Da.16 Address			
4404 4405		4654 4655		Da.17 Parameter 1			
4406 4407		4656 4657		Da.18 Parameter 2			
4410 to 4419		4660 to 4669		2nd item			
4420 to 4429		4670 to 4679		3rd item			
↓		↓		↓			
4490 to 4499		4740 to 4749		10th item			

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Buffer memory address		Item	Memory area		
Axis 1	Axis 2		Indirectly specification data	Positioning start information	Positioning data
4500	5750	Start No. 8001			
4501	4751	Start No. 8002			
↓	↓	↓			
4549	4799	Start No. 8001			
5050		Condition judgment target data of the condition data	PLC CPU memory area		
5099					
5100		Target axis	Block transmission area		
5101		Head positioning data No.			
5102		No. of read/write data			
5103		Read/write request			
5110 to 6109		Read/write block			