Positioning

[Issue No.] T12-0011 **[Page]** 1/6

[Title] Compliance of A1SD75M□ /AD75M□ to MR-J2-03B5 **[Date of Issue]** Sept. '00

[Relevant Models] A1SD75M1, A1SD75M2, A1SD75M3, AD75M1, AD75M2, AD75M3

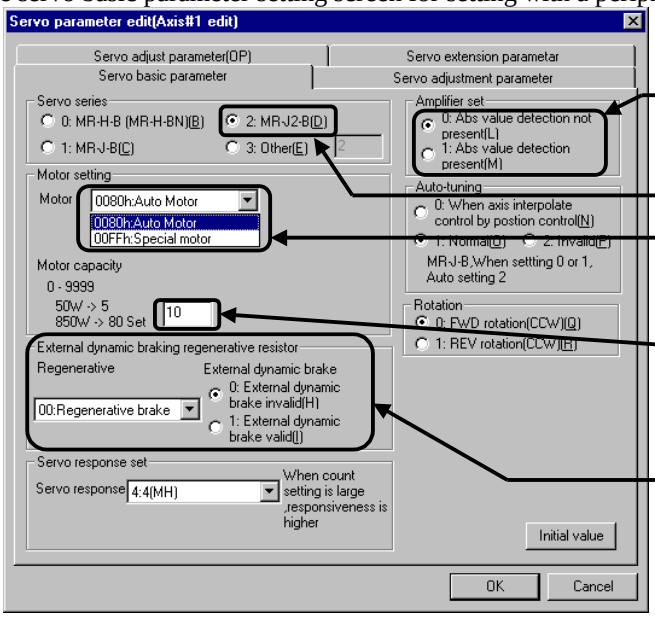
Thank you for your continued patronage of the Mitsubishi general-purpose Programmable Logic Controller MELSEC-A Series.
The methods of setting the servo parameters when using the SSCNET compatible Mitsubishi general-purpose AC servo amplifier MELSERVO-J2 Series (MR-J2-03B5 servo amplifier) marketed in September 2000 with the A1SD75M□/AD75M□ are explained in this bulletin.

Whereas

[Details]
The MR-J2-03B5 is an ultra-compact small capacity servo amplifier compatible with the 24VDC power supply for the MR-J2-□B.
When controlling the MR-J2-03B5 with the A1SD75M□/AD75M□, set the following items with the servo parameters so that the module is recognized as MR-J2-□B.

Item		Setting value
Servo parameter	Servo series	2: MR-J2-B
	Motor	80H: Auto Motor
Positioning parameter	Pulses per revolution	8192 pulses (MR-J2-03B5 feedback)
	Travel per revolution	Set to the amount that the servo motor actually moves in one rotation.
	Unit multiplier	

The servo parameters can be set from a peripheral device such as the software package (ex., SW0D5C-AD75P-E), or with a sequence program.
The servo parameters can be set in the setting range equivalent to MR-J2-□B, but for the parameters deleted with MR-J2-03B5, set the initial values for MR-J2-□B.
For the parameters having different initial values for the MR-J2-□B and MR-J2-03B5, first set the MR-J2-03B5 initial value, and the adjust according to the machine.
The servo basic parameter setting screen for setting with a peripheral device (SW0D5C-AD75P-E) is shown below.



Select "0: Abs value detection not present".
When "1: Abs value detection present" is selected, a servo amplifier error will occur.

Select "MR-J2-B". (Mandatory)

Select "0080H: Auto Motor".
If a setting other than 0080H is selected, a servo amplifier error will occur.

Select a value other than 0. *****
If 0 is set, communication between the A1SD75M□/AD75M□ and servo amplifier will be disabled.

Set Regenerative resistor to "00: Regenerative brake".
Set External dynamic brake to "0: External dynamic brake invalid".
If a value other than 0 is selected, a servo amplifier error will occur.

***:** With the peripheral device (SW0D5C-AD75P-E) version (20C and below) which does not have the motor capacity setting screen, "1" is set automatically.

1. Setting the MR-J2-03B5 parameters

When using the MR-J2-03B5, set the A1SD75M□/AD75M□ servo parameters as shown below.
(Refer to the Servo Amplifier Instruction Manual for detail of the MR-J2-03B5 parameters.)

(1) Servo series
Set "2: MR-J2-B".

(2) Motor
Set "80H: Auto Motor".

(3) Parameters deleted with MR-J2-03B5
Always set the setting values (MR-J2-□B initial values) shown below.

Parameter No.	Item	Setting value
1	Amplifier set	0000H (Absolute value detection not present)
2	Regenerative brake	0000H (Regenerative brake, external dynamic brake invalid)
22	Monitor out mode	0001H (Ch1: 0, Ch2: 1)
23	"Serial encoder cable selection" of option function 1	0: 2-wire type
27	Monitor out 1 offset	0mV
28	Monitor out 2 offset	0mV

(4) Parameters having different initial values for MR-J2-□B and MR-J2-03B5
It is recommended to set the initial values for the MR-J2-03B5, and then adjust according to the machine.

Parameter No.	Item	MR-J2-03B5	
		Setting range	Initial value
9	Servo response set	1 to 5: Normal 8 to C: Large friction	0004H
12	Load inertia ratio	0.0 to 100.0	3.0
13	Position loop gain 1 (rad/s)	4 to 1000	145
14	Speed loop gain 1 (rad/s)	20 to 5000	873
15	Position loop gain 2 (rad/s)	1 to 500	97
16	Speed loop gain 2 (rad/s)	20 to 8000	1144
21	Solenoid brake output (ms)	0 to 1000	0

2. List of A1SD75M□/AD75M□ servo parameter buffer memories

The A1SD75M□/AD75M□ servo parameter buffer memory addresses are listed below.

MR-J2-03B5 Parameter No.	A1SD75M□/AD75M□ Servo parameter	Item	Buffer memory address			Difference from MR-J2-□B*1
			Axis 1	Axis 2	Axis 3	
–	Servo basic parameter	Servo series	100	250	400	–
1		Amplifier set	101	251	401	Deleted with MR-J2-03B5
2		• Regenerative brake • External dynamic brake	102	252	402	Deleted with MR-J2-03B5
3		Motor	103	253	403	–
4		Motor capacity	104	254	404	–
5		Motor speed*2	105	255	405	–
6		Feedback*2	106	256	406	–
7		Rotation	107	257	407	–
8		Auto tuning	108	258	408	–
9		Servo response set	109	259	409	Initial value is different.
12	Servo adjustment parameter	Load inertia ratio	112	262	412	Initial value is different.
13		Position loop gain 1	113	263	413	Initial value is different.
14		Speed loop gain 1	114	264	414	Initial value is different.
15		Position loop gain 2	115	265	415	Initial value is different.
16		Speed loop gain 2	116	266	416	Initial value is different.
17		Speed integral compensation	117	267	417	–
18		Machine resonance suppression filter	118	268	418	–
19		Feed forward gain	119	269	419	–
20		In-position range	120	270	420	–
21		Solenoid brake output	121	271	421	Initial value is different
22		Monitor out mode	122	272	422	Deleted with MR-J2-03B5
23		Option function 1	123	273	423	With the MR-J2-03B5, the "serial encoder cable selection" has been deleted.
24		Option function 2	124	274	424	–
27	Servo expansion parameter	Monitor out 1 offset	127	277	427	Deleted with MR-J2-03B5
28		Monitor out 2 offset	128	278	428	Deleted with MR-J2-03B5
30		Zero speed	130	280	430	–
31		Excess error alarm	131	281	431	–
32		Option function 5	132	282	432	–
34		PI-PID position droop	134	284	434	–
36		Speed differential compensation	136	286	436	–

*1: Set items marked with "-" to the MR-J2-□B setting. If the item is indicated as "Deleted with MR-J2-03B5" or "Initial value is different", refer to "1. Setting the MR-J2-03B5 parameters".

*2: The setting values are ignored with MR-J2-□B and MR-J2-03B5.

3. Setting the A1SD75M□/AD75M□ servo parameters (MR-J2-03B5 values)

The A1SD75M□/AD75M□ servo parameters can be set with the following two methods:

- Setting with the sequence program
- Setting with the peripheral device

(1) Setting with the sequence program

The sequence program used to set the servo parameters with the ACPU is explained in this section.
(The program is for when A1SD75M□/AD75M□ is mounted in slot 0 of the basic base unit and set to axis 1.)

- Setting data
  Change the following devices according to the system being used.

Device name	Device	Application		Stored value	Details of stored value(D0 to D29)
Special relay	M9038	ON for only 1 scan after RUN		–	–
Data registers	D0	Servo basic parameter	Servo series	2	Servo amplifier series MR-J2-□B
	D1		Amplifier set	0	Absolute value detection not present
	D2		Regenerative brake	0000H	External dynamic brake invalid Regenerative brake
	D3		Motor	0080H	Auto Motor
	D4		Motor capacity	10	(Value other than 0)
	D5		Motor speed	1	(The setting value is ignored with the MR-J2-03B5.)
	D6		Feedback	0	(The setting value is ignored with the MR-J2-03B5.)
	D7		Rotation	0	Forward run when positioning address increments
	D8		Auto tuning	1	Auto tuning mode 1
	D9		Servo response set	0004H	Servo response 4 (Normal)
	D10	Servo adjustment parameter	Load inertia ratio	30	Load inertia ratio 3.0
	D11		Position loop gain 1	145	Position loop gain 145rad/s
	D12		Speed loop gain 1	873	Speed loop gain 873rad/s
	D13		Position loop gain 2	97	Position loop gain 97rad/s
	D14		Speed loop gain 2	1144	Speed loop gain 1144rad/s
	D15		Speed integral compensation	20	Speed integral compensation 20ms
	D16		Machine resonance suppression filter	0000H	Machine resonance suppression frequency not used
	D17		Feed forward gain	0	Feed forward gain 0%
	D18		In-position range	100	In-position range 100 pulse
	D19		Solenoid brake output	0	Solenoid brake output 0ms
	D20		Monitor out mode	0001H	(Set the initial value for the MR-J2-□B)
	D21		Option function 1	0000H	Amplifier EMG selection: Valid Serial encoder cable selection: 2-wire type
	D22		Option function 2	0000H	Slight vibration suppression control selection: Invalid Selected motor less operation: Invalid
	D23	Servo expansion parameter	Monitor out 1 offset	0	(Set the initial value for the MR-J2-□B)
	D24		Monitor out 2 offset	0	(Set the initial value for the MR-J2-□B)
	D25		Zero speed	50	Zero speed 50r/min
	D26		Excess error alarm	80	Excess error alarm 80kpulse
	D27		Option function 5	0000H	PI-PID switching: Invalid
	D28		PI-PID position droop	0	PI-PID position droop: Invalid
	D29		Speed differential compensation	980	Speed differential compensation 980

• Sequence program

```
*
* A1SD75M/AD75M servo parameter (Axis 1) Setting program (ACPU)
*
0    M9038  [MOVP K2    D0  ]  Servo series (MR-J2-B)
            [MOVP K0    D1  ]  Amplifier set (Absolute value detection not present)
            [MOVP H0    D2  ]  Regenerative brake (No selection)
            [MOVP H80   D3  ]  Motor (Auto Motor)
            [MOVP K10   D4  ]  (Dummy)
            [MOVP K1    D5  ]  (Dummy)
            [MOVP K0    D6  ]  (Dummy)
            [MOVP K0    D7  ]  Rotation (Forward run)
            [MOVP K1    D8  ]  Auto tuning (Mode 1)
            [MOVP H4    D9  ]  Servo response set (Response 4)
            [MOVP K30   D10 ]  Load inertia ratio (3.0)
            [MOVP K145  D11 ]  Position loop gain 1 (145rad/s)
            [MOVP K873  D12 ]  Speed loop gain 1 (873rad/s)
            [MOVP K97   D13 ]  Position loop gain 2 (97rad/s)
            [MOVP K1144 D14 ]  Speed loop gain 2 (1144rad/s)
            [MOVP K20   D15 ]  Speed integral compensation (20ms)
            [MOVP H0    D16 ]  Machine resonance suppression filter (Not used)
86   M9038  [MOVP K0    D17 ]  Feed forward gain (0%)
            [MOVP K100  D18 ]  In-position range (100pulse)
            [MOVP K0    D19 ]  Solenoid brake output (0ms)
            [MOVP H1    D20 ]  (Dummy)
            [MOVP H0    D21 ]  Option function 1 setting
            [MOVP H0    D22 ]  Option function 2 setting
            [MOVP K0    D23 ]  (Dummy)
            [MOVP K0    D24 ]  (Dummy)
            [MOVP K50   D25 ]  Zero speed (50r/min)
            [MOVP K80   D26 ]  Excess error alarm (80kpulse)
            [MOVP H0    D27 ]  Option function 5 setting
            [MOVP K0    D28 ]  PI-PID position droop (Invalid)
            [MOVP K980  D29 ]  Speed differential compensation (980)
152  M9038  [TOP H0 K100 D0  K10]  }
            [TOP H0 K112 D10 K13]  }
            [TOP H0 K127 D23 K2 ]  }  Batch write to servo parameter buffer memory
            [TOP H0 K130 D25 K3 ]  }
            [TOP H0 K134 D28 K1 ]  }
            [TOP H0 K136 D29 K1 ]  }
```

*: When using the QCPU (Q mode)/QnACPU, change M9038 to SM402.

(2) Setting with the peripheral device
Observe the following precautions when setting the servo parameters with the peripheral device.

<Precautions>
- Using the peripheral device, select the Servo series "2: MR-J2-B" and the Motor "80H: Auto Motor".
- Set the servo parameters deleted with MR-J2-03B5 to the initial values for MR-J2-□B. (Refer to "1. Setting the MR-J2-03B5 parameters" for the MR-J2-□B initial values.)
- Set the other servo parameters according to MR-J2-□B.

4. Restrictions for using peripheral device

The restrictions for using the peripheral device*1 are given below.

Item	Details
Servo parameter	**[View screen display when parameters deleted with MR-J2-03B5 are read with SW0D5C-AD75P-E]** Amplifier set : "0: Abs value detection not present" Regenerative brake : "00: Regenerative brake" "External dynamic brake invalid" Monitor out mode (Analog monitor CH1 out) : "Reading value <HEX>" Monitor out mode (Analog monitor CH2 out) : "Reading value <HEX>" Monitor out 1 offset : Buffer memory data is displayed. Monitor out 2 offset : Buffer memory data is displayed.
Servo monitor	Parameter/error monitor : When values outside the MR-J2-□B setting range are set with the sequence program for the parameters deleted with MR-J2-03B5, and error will appear. Refer to "1. Setting the MR-J2-03B5 parameters", and set the MR-J2-□B initial values.
Register servo name*2	Servo series : Select "MR-J2-B". Motor : Select "128 (80H) Auto Motor".

*1: The peripheral device refers to a personal computer which the SW1IVD-AD75P-E or SW0D5C-AD75P-E type software package is installed and AD75TU.
*2: This is not mounted on the AD75TU.