MITSUBISHI
PROGRAMMABLE CONTROLLER

Type A1SD75P1/P2/P3
AD75P1/P2/P3 Positioning Unit

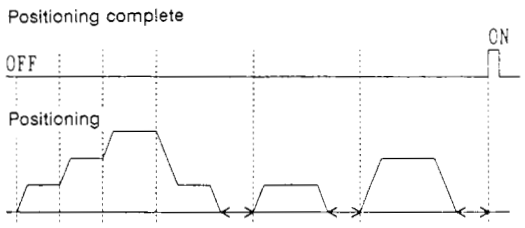
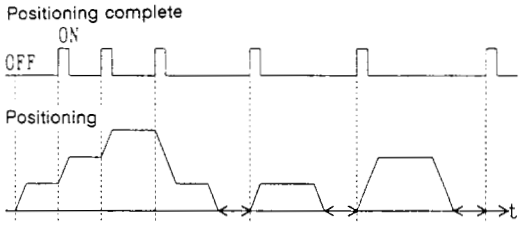
User's Manual

<Supplementary Manual>

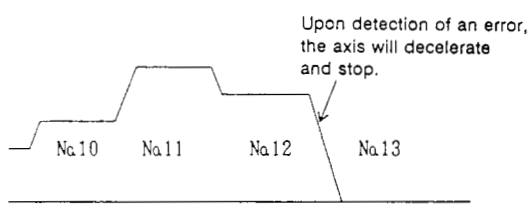
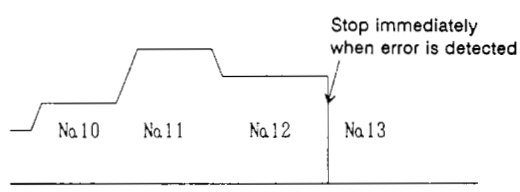
MITSUBISHI ELECTRIC CORPORATION

BCN-P5133-*

1. Corrigenda

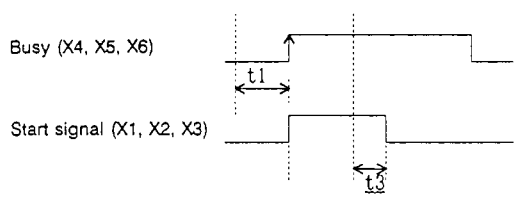
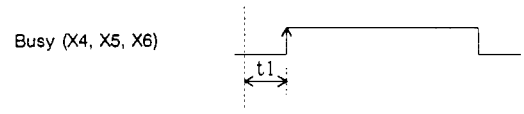
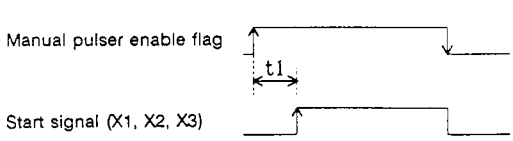
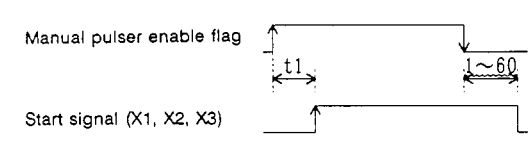
<table>
<tr><th>Page</th><th>Mistake</th><th>Correction</th></tr>
<tr><td>1-16</td><td>Correction of 2-axis circular interpolation in Table 1.1
<table><tr><td></td><td></td><td></td></tr><tr><td>2-axis linear interpolation</td><td>O</td><td>O</td></tr><tr><td>2-axis circular interpolation</td><td>O</td><td>O</td></tr></table></td><td><table><tr><td></td><td></td><td></td></tr><tr><td>2-axis linear interpolation</td><td>O</td><td>O</td></tr><tr><td>2-axis circular interpolation</td><td>O</td><td>×</td></tr></table></td></tr>
<tr><td>3-36</td><td>Correction of positioning complete signal ON/OFF timing in drawing
 
</td><td> 
</td></tr>
<tr><td>3-37</td><td>Addition of precaution for start complete signal at start of external positioning run
——</td><td>(b) Start of external positioning run
4) When starting with an external start signal, the start complete signal will not turn ON.</td></tr>
<tr><td>3-44</td><td>Addition and correction of point (1) details
(1) In interpolation control, only the travel direction of the applicable axis is checked. Therefore, automatic deceleration is not performed as long as the travel direction on the reference axis remains unchanged.
This may result in sudden direction reversal on the other interpolation axis.</td><td>(1) In interpolation control, only the travel direction of the reference axis is checked. Therefore, automatic deceleration is not performed as long as the travel direction on the reference axis remains unchanged.
This may result in sudden direction reversal on the other interpolation axis.
To avoid sudden reversal of the partner axis, do not use the continuous path control (11) for the passing point, and instead use continuous positioning control (01).</td></tr>
<tr><td>3-48</td><td>Correction of 10th line
The positioning address and arc data for each axis are used.</td><td>The positioning address and arc data set in the same positioning data No. for each axis is used.</td></tr>
<tr><td>3-48</td><td>Addition of precaution for interpolation
——</td><td>When interpolating with the continuous positioning control and continuous path control, interpolate from the first positioning data No. to the (run pattern: 00) positioning data No.
If the positioning data No. set in each point for the positioning start data in block start is interpolation, all points must be interpolation.</td></tr>
</table>

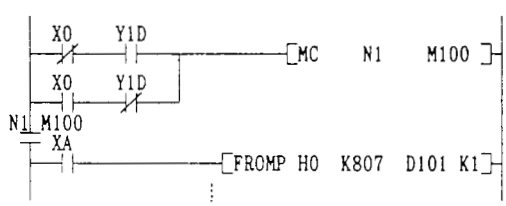
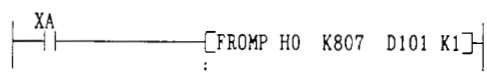
<table>
<tr><th>Page</th><th>Mistake</th><th>Correction</th></tr>
<tr><td>3-55</td><td colspan="2">Change of (7) (e) section</td></tr>
<tr><td></td><td>(e) Software stroke limit check
During execution of speed control, checking is not performed as long as the travel value is within the software stroke limit range.
If the travel value exceeds the software stroke limit range, an error will occur at the time of switching to position control, and the axis will decelerate to a stop.</td><td>(e) Software stroke limit check
The software stroke limit range will be checked at start up only when the "feed current value update during speed control request" is ON.</td></tr>
<tr><td>3-55</td><td colspan="2">Addition of (8)</td></tr>
<tr><td></td><td>——</td><td>(8) Designation of positioning data
The following positioning data is set in the peripheral device and sequence program.
<table><tr><th>Item</th><th>Setting necessity</th></tr><tr><td>Run pattern</td><td>○</td></tr><tr><td>Control method</td><td>Select: "Forward run speed/position" "Reverse run speed/position"</td></tr><tr><td>Acceleration time</td><td>○</td></tr><tr><td>Deceleration time</td><td>○</td></tr><tr><td>Positioning address/ movement rate</td><td>○</td></tr><tr><td>Circular address</td><td>—</td></tr><tr><td>Command speed</td><td>△</td></tr><tr><td>M code</td><td>△</td></tr></table>[Remarks]
1) *1: Refer to section 3.4.5 for details on the positioning data.
2) *2: The setting necessity is indicated with the following symbols.
○: Setting required △ : Set as required
—: Setting not required
3) *3: The "Forward run speed/position" and "Reverse run speed/position" control methods are selected according to the motor rotation direction.</td></tr>
<tr><td>3-74</td><td colspan="2">Correction of point details</td></tr>
<tr><td></td><td>The absolute original point is not changed after any of the following control operations is performed:
• Present feed value 0 clear at the start of fixed-pitch feed
• Present feed value 0 clear during speed control
• Present feed value update request command during speed control</td><td>The absolute original point is not changed after any of the following control operations is performed:
• Present feed value 0 clear at the start of fixed-pitch feed
• ——————————
• Present feed value update request command OFF during speed control</td></tr>
</table>

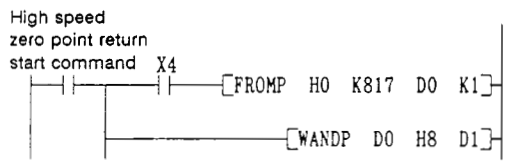
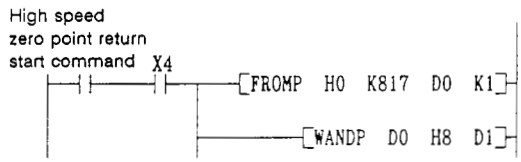
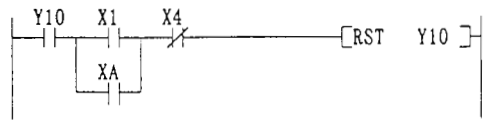
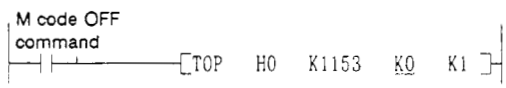
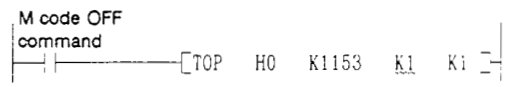
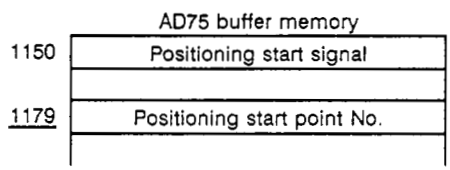
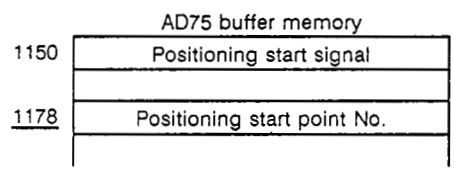
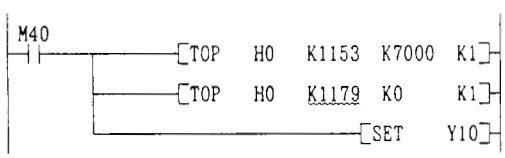
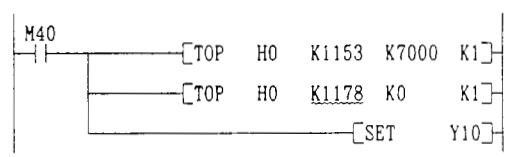
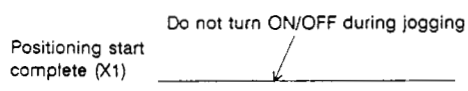
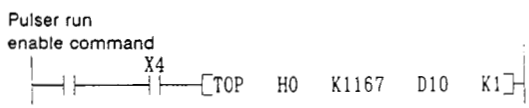
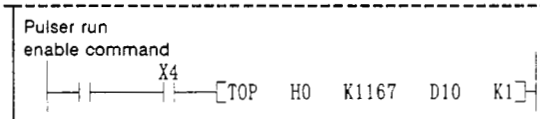
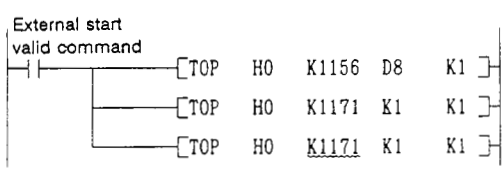
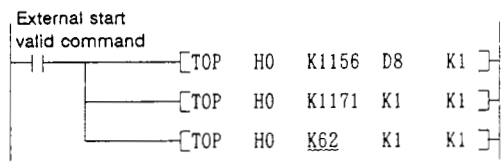
<table>
<tr><th>Page</th><th>Mistake</th><th>Correction</th></tr>
<tr><td>3-78</td><td colspan="2">Addition of (b) details to (8)</td></tr>
<tr><td></td><td>——</td><td>(b) Change of speed during zero point return
The speed cannot be changed after the creeping speed is entered.</td></tr>
<tr><td>3-81</td><td colspan="2">Correction of (4) (d) section</td></tr>
<tr><td></td><td>(d) For the manual pulse generator 1 pulse input magnification, set the value for the relevant axis.
If the magnification is outside the setting range, an axis error will occur, and manual pulse generator operation will not be performed. In such a case, input pulses from the manual pulse will be ignored.</td><td>(d) For the manual pulse generator 1 pulse input magnification, set the value for the relevant axis.
The manual pulser will run with the following values when the value is not in the setting range.
• If the input scale per pulse of the manual pulser is 101 or higher, the pulser will run at 100.
• If the input scale per pulse of the manual pulser is 0 or less, the pulser will run at 1.</td></tr>
<tr><td>3-83</td><td colspan="2">Correction of [Remarks] 2) Buffer memory address</td></tr>
<tr><td></td><td><table><tr><th>Axis No.</th><th>Axis 1</th><th>Axis 2</th></tr><tr><td>Buffer memory address</td><td>1161,1160</td><td>1201,1200</td></tr></table></td><td><table><tr><th>Axis No.</th><th>Axis 1</th><th>Axis 2</th></tr><tr><td>Buffer memory address</td><td>1161,1160</td><td>1211,1210</td></tr></table></td></tr>
<tr><td>3-83</td><td colspan="2">Correction of (4) (a) section</td></tr>
<tr><td></td><td>(a) When the stop signal is turned ON during JOG start, axis motion decelerates to a stop.
The start complete signal is turned OFF concurrently.</td><td>(a) When the stop signal is turned ON during JOG start, axis motion decelerates to a stop.</td></tr>
<tr><td>3-86</td><td colspan="2">Correction of [Remarks] 1) Buffer memory address</td></tr>
<tr><td></td><td><table><tr><th colspan="2">Axis No.</th><th>Axis 1</th><th>Axis 2</th></tr><tr><td rowspan="2">Buffer memory address</td><td>Speed change value</td><td>1157,1156</td><td>1197,1196</td></tr><tr><td>Speed change request</td><td>1158</td><td>1198</td></tr></table></td><td><table><tr><th colspan="2">Axis No.</th><th>Axis 1</th><th>Axis 2</th></tr><tr><td rowspan="2">Buffer memory address</td><td>Speed change value</td><td>1157,1156</td><td>1202,1201</td></tr><tr><td>Speed change request</td><td>1158</td><td>1208</td></tr></table></td></tr>
<tr><td>3-91</td><td colspan="2">Correction of stop process in example</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
</table>

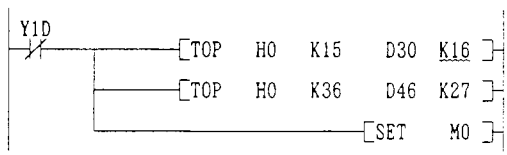
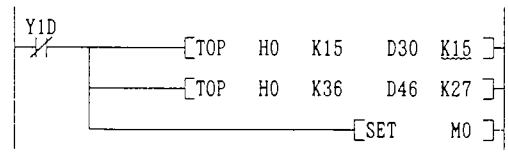
<table>
<tr><th>Page</th><th>Mistake</th><th>Correction</th></tr>
<tr><td>3-92</td><td>Addition to [Remarks] 1) Buffer memory address
<table>
<tr><th>Axis No.</th><th></th><th>Axis 2</th><th>Axis 3</th></tr>
<tr><td>Upper stroke limit</td><td></td><td></td><td></td></tr>
<tr><td>Lower stroke limit</td><td></td><td></td><td></td></tr>
<tr><td>Software limit selection</td><td></td><td></td><td></td></tr>
<tr><td>Invalidating the software limit during JOG operation and manual pulse generator operation</td><td></td><td></td><td></td></tr>
</table></td><td>
<table>
<tr><th>Axis No.</th><th></th><th>Axis 2</th><th>Axis 3</th></tr>
<tr><td>Upper stroke limit</td><td></td><td>166,167</td><td>316,317</td></tr>
<tr><td>Lower stroke limit</td><td></td><td>168,169</td><td>318,319</td></tr>
<tr><td>Software limit selection</td><td></td><td>170</td><td>320</td></tr>
<tr><td>Invalidating the software limit during JOG operation and manual pulse generator operation</td><td></td><td>171</td><td>321</td></tr>
</table></td></tr>
<tr><td>3-93</td><td>Correction of (4) (a) section
(a) If the electronic gear setting value is too great, the commanded speed may exceed the speed control value, causing the servomotor to operate at too high a speed.</td><td>(a) If the electronic gear setting value is too small, the real speed may exceed the speed control value, causing the servomotor to operate at too high a speed.</td></tr>
<tr><td>3-96</td><td>Correction of (c) section
c) Set the speed control limit, acceleration time, deceleration time, and rapid stop deceleration time by specifying their respective parameters.</td><td>(c) When the M code ON signal is turned ON, the M code OFF request must be turned ON with the sequence program, and the M code ON signal must be turned OFF.
If the M code ON signal is not turned OFF, the process will be as shown below according to the run pattern.</td></tr>
<tr><td>3-105</td><td>Correction of (c) section
(c) A speed change can be executed at any given point during the following positioning operation by turning ON either the positioning speed change request in the control axis data or the positioning external speed change signal in the external signals.</td><td>(c) By turning the axis control data run speed change request ON or by turning the external signal external speed change ON, the speed can be changed at a random point.</td></tr>
<tr><td>3-106</td><td>Correction of (2) (d) Buffer memory address
<table>
<tr><th></th><th rowspan="2">Reference axis</th><th colspan="2">Buffer memory</th></tr>
<tr><th>Speed change</th><th>Speed change request</th></tr>
<tr><td></td><td>Axis 1</td><td>1156,1157</td><td>1158</td></tr>
<tr><td></td><td>Axis 2</td><td>1056,1057</td><td>1208</td></tr>
<tr><td></td><td>Axis 3</td><td>1256,1257</td><td>1358</td></tr>
</table></td><td>
<table>
<tr><th></th><th rowspan="2">Reference axis</th><th colspan="2">Buffer memory</th></tr>
<tr><th>At speed change</th><th>Speed change request</th></tr>
<tr><td></td><td>Axis 1</td><td>1156,1157</td><td>1158</td></tr>
<tr><td></td><td>Axis 2</td><td>1206,1207</td><td>1208</td></tr>
<tr><td></td><td>Axis 3</td><td>1256,1257</td><td>1258</td></tr>
</table></td></tr>
<tr><td>3-107</td><td>Addition of (g) explanation
(g) Even when the operation pattern is set to continuous locus control (11), an immediate speed change can be executed upon receiving a speed change request.</td><td>(g) Even when the operation pattern is set to continuous locus control (11), an immediate speed change can be executed upon receiving a speed change request.
However, if the distance required to change to the designated speed is not secured, the speed cannot be changed.</td></tr>
<tr><td>3-111</td><td>Correction of (2) (a) section
(a) If the step enable signal has been turned ON, the BUSY signal is turned ON when the positioning start signal is turned ON, performing the first-point positioning designated in the positioning start table.</td><td>(a) Set the step valid flag ON beforehand, and turn the positioning start signal ON.</td></tr>
</table>

Page	Mistake	Correction
3-111	Change of (2) (e) section	
	(e) Once the first-point positioning has started, the next positioning step is performed if the step start data is set to 01H when the axis operation status is step standby.	(e) If the step start information is set to 01H while the axis run state is the step wait state, the next positioning step will be executed.
3-111	Deletion of (2) (f)	
	(f) When step operation is performed continuously, it is first confirmed that the step start data is set to 00H (by the OS), then the step start data is set to 01H.	——
3-111	Correction of (2) (g) section	
	(g) Once the first-point positioning has started, the stopped processing of positioning data restarts if the step start data is set to 01H or 02H when the axis operation status is step-stopped.	(g) If the step start information is set to 01H or 02H while the axis run state is the step stop state, the stopped positioning data will be restarted.
3-112	Correction of (2) (j) section	
	(j) When the axis operation status is step standby, step-stopped, or step error with the step effective signal ON, the first-point positioning step will be performed upon turning ON the positioning start signal again.	(j) If the positioning start signal is turned ON again while step waiting for the step valid signal ON, while step stopped or during a step error, the step for positioning the positioning No. designated with the positioning start No. will be executed.
3-117	Correction of buffer memory address	
	... Set 500_H in buffer memory address 1138.	... Set 500_H in buffer memory address 1105.
3-118	Correction of buffer memory address	
	... Set 600_H in buffer memory address 1138. ... Set 500_H in buffer memory address 1138.	... Set 600_H in buffer memory address 1105. ... Set 500_H in buffer memory address 1105.
3-120	Addition of explanation to (2) (e)	
	(e) If it is not possible to secure a sufficient distance for this function to change the current speed to the designated override speed, the current speed is changed to the highest possible speed within the given distance.	(e) If it is not possible to secure a sufficient distance for this function to change the current speed to the designated override speed, the current speed is changed to the highest possible speed within the given distance. However, if the run pattern is the continuous path control, the speed will not be changed.
3-120	Correction of (2) (h) section	
	(h) If the feed speed of 1 or less results from setting an override value of 100% or less, a warning (warning No.110) occurs, while the feed is performed at the speed of "1" in the current speed units.	(h) If an override value of 100% or less is set and the feedrate is 1 or less, run will take place at the speed unit 1.
3-120	Addition of (i) to (2)	
	——	(i) If the set override value is not in the setting range, run will take place at the following values. • When 0% : Run at 100% • When 301% or higher: Run at 300%
3-122	Change of (1) explanation	
	(1) Feedrate, feed mechanical value address The feedrate, feed mechanical value address is a ring address between 0 and 360°.	(1) Feedrate, feed mechanical value address The feedrate, feed mechanical value address is a ring address between 0 and 359.99999°.

<table>
<tr><th>Page</th><th>Mistake</th><th>Correction</th></tr>
<tr><td>3-148</td><td colspan="2">Addition of command code to control methods in Table 3.8</td></tr>
<tr><td></td><td>
<table>
<tr><th>Setting details</th></tr>
<tr><td>• Axis 1 linear control (ABS)</td></tr>
<tr><td>• Axis 1 linear control (INC)</td></tr>
<tr><td>• Axis 1 inching control</td></tr>
<tr><td>• Axis 2 linear interpolation control (ABS)</td></tr>
<tr><td>• Axis 2 linear interpolation control (INC)</td></tr>
<tr><td>• Inching control of axis 2 with linear interpolation</td></tr>
<tr><td>• Circular interpolation control with auxiliary point designation (ABS)</td></tr>
<tr><td>• Circular interpolation control with auxiliary point designation (INC)</td></tr>
<tr><td>• Circular interpolation control with center point designation (ABS, CW)</td></tr>
<tr><td>• Circular interpolation control with center point designation (ABS, CCW)</td></tr>
<tr><td>• Circular interpolation control with center point designation (INC, CW)</td></tr>
<tr><td>• Circular interpolation control with center point designation (INC, CCW)</td></tr>
<tr><td>• Speed control (forward run)</td></tr>
<tr><td>• Speed control (reverse run)</td></tr>
<tr><td>• Speed/position changeover control (forward run)</td></tr>
<tr><td>• Speed/position changeover control (reverse run)</td></tr>
<tr><td>• Current value change</td></tr>
</table>
</td><td>
<table>
<tr><th>Setting details</th><th>Command code</th></tr>
<tr><td>• Axis 1 linear control (ABS)</td><td>01H</td></tr>
<tr><td>• Axis 1 linear control (INC)</td><td>02H</td></tr>
<tr><td>• Axis 1 inching control</td><td>03H</td></tr>
<tr><td>• Axis 2 linear interpolation control (ABS)</td><td>04H</td></tr>
<tr><td>• Axis 2 linear interpolation control (INC)</td><td>05H</td></tr>
<tr><td>• Inching control of axis 2 with linear interpolation</td><td>06H</td></tr>
<tr><td>• Circular interpolation control with auxiliary point designation (ABS)</td><td>07H</td></tr>
<tr><td>• Circular interpolation control with auxiliary point designation (INC)</td><td>08H</td></tr>
<tr><td>• Circular interpolation control with center point designation (ABS, CW)</td><td>09H</td></tr>
<tr><td>• Circular interpolation control with center point designation (ABS, CCW)</td><td>0AH</td></tr>
<tr><td>• Circular interpolation control with center point designation (INC, CW)</td><td>0BH</td></tr>
<tr><td>• Circular interpolation control with center point designation (INC, CCW)</td><td>0CH</td></tr>
<tr><td>• Speed control (forward run)</td><td>0DH</td></tr>
<tr><td>• Speed control (reverse run)</td><td>0EH</td></tr>
<tr><td>• Speed/position changeover control (forward run)</td><td>0FH</td></tr>
<tr><td>• Speed/position changeover control (reverse run)</td><td>10H</td></tr>
<tr><td>• Current value change</td><td>11H</td></tr>
</table>
</td></tr>
<tr><td>3-157</td><td colspan="2">Correction of X4, X5, X6 section</td></tr>
<tr><td></td><td>• In manual pulse generator operation, it is ON during positioning in accordance with pulse input from the manual pulse generator.</td><td>• During revised path pulser run, the in-manual pulser enable flag ON will turn ON.</td></tr>
<tr><td>3-158</td><td colspan="2">Correction of Y10, Y11, Y12 section</td></tr>
<tr><td></td><td>• When the start signal is turned ON during BUSY, a multiple start warning is issued.</td><td>• When the start signal is turned ON during BUSY, the running start warning is issued.</td></tr>
<tr><td>3-158</td><td colspan="2">Correction of Y1D explanation (d)</td></tr>
<tr><td></td><td>• Turn the AD75 ready signal OFF.</td><td>• Turn the AD75 ready signal ON.</td></tr>
<tr><td>3-162</td><td colspan="2">Correction of start complete signal run timing in drawing for (4)</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
<tr><td>3-163</td><td colspan="2">Correction of BUSY signal ON/OFF timing in drawing for (5)</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
</table>

<table>
<tr><th>Page</th><th>Mistake</th><th>Correction</th></tr>
<tr><td>3-169</td><td colspan="2">Deletion of unit scale limits in table for (1)</td></tr>
<tr><td></td><td>
<table>
<tr><td>Unit magnifi-cation</td><td>1: ×1 times, 10: ×10 times,
100: ×100 times, 1000: ×1000 times
[Valid when the unit setting is mm, inches or degrees, and invalid when it is pulses.
A setting error occurs for values other than the above.]</td></tr>
</table>
</td><td>
<table>
<tr><td>Unit magnifi-cation</td><td>1: ×1 times, 10: ×10 times,
100: ×100 times, 1000: ×1000 times</td></tr>
</table>
</td></tr>
<tr><td>3-169</td><td colspan="2">Change of speed limit value unit in table for (2)</td></tr>
<tr><td></td><td>
<table>
<tr><td>Speed limit value</td><td>1~600000000
× 10^{-2} μm/min</td><td></td></tr>
</table>
</td><td>
<table>
<tr><td>Speed limit value</td><td>1~600000000
× 10^{-2} mm/min</td><td></td></tr>
</table>
</td></tr>
<tr><td>3-187</td><td colspan="2">Correction of setting range for speed/position changeover control movement rate change register</td></tr>
<tr><td></td><td>0~2147483647</td><td>1~2147483647</td></tr>
<tr><td>3-187</td><td colspan="2">Correction of setting range for manual pulser one pulse input scale</td></tr>
<tr><td></td><td>
<table>
<tr><td>1~100000
×10^{-1} μm</td><td>1~100000
×10^{-1} inch</td><td>1~100000
×10^{-1} degree</td><td>1~100000
×10^{-1} pulse</td></tr>
</table>
</td><td>1~100</td></tr>
<tr><td>3-188</td><td colspan="2">Addition of positioning start point No. area</td></tr>
<tr><td></td><td>—</td><td>
<table>
<tr><td>1178</td><td>1228</td><td>1278</td><td>Positioning start point No.</td><td>Set the start point No. for executing positioning (block start).
1 to 50:
Start from designated No.
Other than the above:
Start from the first point</td></tr>
</table>
</td></tr>
<tr><td>4-1</td><td colspan="2">Change of reference section</td></tr>
<tr><td></td><td>• Monitor with the AD75 17-segment LED and LED for axis display.
(Refer to section 4.7)</td><td>• Monitor with the AD75 17-segment LED and LED for axis display.
(Refer to section 4.6)</td></tr>
<tr><td>4-15</td><td colspan="2">Change of details explained in (Procedure 5) (3).</td></tr>
<tr><td></td><td>(3) When the mode switch is pressed, the condition is switched to internal information monitor 2, which is described in step 5.</td><td>(3) When the mode switch is pressed, the state of the input/output information n monitor shown in (Procedure 6) will be moved to.</td></tr>
<tr><td>5-2</td><td colspan="2">Change of program example (Deletion of MC N1 M100)</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
</table>

<table>
<tr><th>Page</th><th>Mistake</th><th>Correction</th></tr>
<tr><td>6-7</td><td colspan="2">Change of program example</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
<tr><td>7-11</td><td colspan="2">Correction of M code OFF request write program (Same for pages 7-12 and 7-14)</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
<tr><td>7-13</td><td colspan="2">Correction of buffer memory address used in program example</td></tr>
<tr><td></td><td>(Data transfer, input/output signal)
 
</td><td>(Data transfer, input/output signal)
 
</td></tr>
<tr><td>7-13</td><td colspan="2">Correction of buffer memory address used in program example</td></tr>
<tr><td></td><td>Start point No.
(buffer memory address 1179)
  </td><td>Start point No.
(buffer memory address 1178)
  </td></tr>
<tr><td>7-14</td><td colspan="2">Correction of buffer memory address used in program example</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
<tr><td>8-5</td><td colspan="2">Correction of positioning start complete (X1) signal timing in program example</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
<tr><td>9-6</td><td colspan="2">Correction of program example</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
<tr><td>10-6</td><td colspan="2">Correction of program example</td></tr>
<tr><td></td><td> 
</td><td> 
</td></tr>
</table>

Page	Mistake	Correction
12-6	Deletion of data register (D45), AD75 buffer memory (30)	
	D44 0 (Do not run manual pulser) D45 0 (Positive logic) 29 Manual pulser selection 30 Select pulse output logic to drive unit	D44 0 (Do not run manual pulser) 29 Manual pulser selection
12-7	Correction of buffer memory address used in program example	
		

2. Additional explanation on condition data (section 3.4.7)

The condition data is used to judge conditions when executing conditional start, wait start and simultaneous start.

The condition data can be created in the buffer memory as condition data No. 1 to 10.

Axis No.	Buffer memory address
Axis 1	4400~4499
Axis 2	4650~4749
Axis 3	4900~4990

One condition data item is configured of a condition identifier and three parameters (address, parameter 1, parameter 2).

Configuration of condition data

Condition identifier	16-bit
Open	16-bit
Address	32-bit
Parameter 1	32-bit
Parameter 2	32-bit
Open	32-bit

The range of each parameter in the condition data is checked when the positioning data No. is executed. If the setting of each parameter in the condition data is not within the range, an error will occur and the data will not be executed.

(1) Condition identifier

The condition identifier has a condition target and condition operator for judging the condition.

(a) Condition target

The target for condition judgment is set in the condition target.
The following five types of condition targets are available.

Condition target	Command code
Device X	01_H
Device Y	02_H
Buffer memory (16-bit)	03_H
Buffer memory (32-bit)	04_H
Positioning data	05_H

(b) **Condition operator**

① The condition operator sets the method for calculating according to the condition target. The following 14 types of condition operators are available.

Condition operator		Relation of condition target and parameter	Command code	Command target that can be designated
Normal operator	=	n = (parameter 1)	1_H	Buffer memory (16/32-bit)
	≠	n ≠ (parameter 1)	2_H	
	≤	n ≤ (parameter 1)	3_H	
	≥	n ≥ (parameter 1)	4_H	
Range operator	Range designation 1	(Parameter 1) ≤ n ≤ (parameter 2)*1	5_H	Buffer memory (16/32-bit)
	Range designation 2	n ≥ (parameter 1), n ≥ (parameter 2)	6_H	
Bit operator	ON	Parameter 1 ON	7_H	Device X Device Y
	OFF	Parameter 1 OFF	8_H	
Simultaneous start	Axis designation	Axis 1 designation	9_H	Positioning data No.
		Axis 2 designation	A_H	
		Axis 1 and Axis 2 designation	B_H	
		Axis 3 designation	C_H	
		Axis 1 and Axis 3 designation	D_H	
		Axis 2 and Axis 3 designation	E_H	

② Judgment of condition operator "=", "≠"

The special start commands for executing condition judgment include "conditional start", "wait start" and "FOR (condition)".

The processes of the condition operators "=" and "≠" differ during condition judgment of the above special start commands.

a. Conditional start

During conditional start, the value used for condition judgment is the instant value during judgment.

Thus, if "=" is used, the conditions usually will not be established.

On the other hand, if "≠" is used, the conditions will always be established.

Use the range operator to prevent the above phenomenon.

b. Wait start, FOR (condition)

The condition judgment is controlled with the AD75 control cycle.

Thus, even if the conditions are not established with the current control cycle, if they are established at the next control cycle, wait and FOR will be completed.

[Remarks]

1) *1: During range designation 1, an error will occur if (parameter 1) > (parameter 2).

(2) Address

(a) The address is used to designate the buffer memory address used when the condition operator is a "normal operator" or "range operator".
The condition judgment is done with the value of the buffer memory designated with the address and the parameter 1 and 2 values.

(b) The address is not used when the condition target is "device X", "device Y" or "positioning data No.".

(3) Parameter 1

(a) Parameter 1 is the data set when the condition operator is a "normal operator", "range operator", "bit operator" or "positioning data No.".

(b) The data that is set differs according to the operator being used.

Condition target	Normal operator/range operator	Bit operator
Device X	—	Bit No.
Device Y	—	Bit No.
Buffer memory (16-bit)	Numerical value	—
Buffer memory (32-bit)	Numerical value	—

If the condition operator is "simultaneous start", the positioning data No. of the partner axis to be simultaneously started is set. (Refer to (5).)

(4) Parameter 2

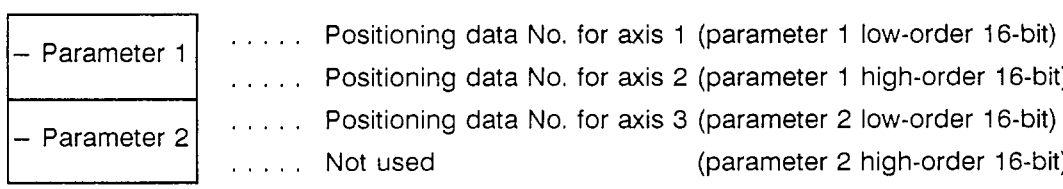
(a) Parameter 2 is used to set the data required for the range operator.

(b) Only numerical value data can be set in parameter 2.
If the condition operator is "simultaneous start", the positioning data No. of the partner axis to be simultaneously started is set. (Refer to (5).)

(5) Setting of parameter 1 and parameter 2 for simultaneous start

(a) When the condition operator is simultaneous start, parameters 1 and 2 are used to set the positioning data No. of the axis to be simultaneously started.
For example, if linear interpolation of axes 1 and 2 and axis 3 are to be simultaneously started, the positioning data No. for axis 1 and axis 3 is set.

(b) The axis 1 to 3 positioning data No. is set as shown below.
(The areas used with axis 1 to 3 are fixed.)



3. Additional explanation on positioning start information area (section 3.6.6)

(1) Positioning start data area

(a) The positioning start data area is the area used for block positioning.
Areas for point 1 to point 50 are provided for the positioning start data area.

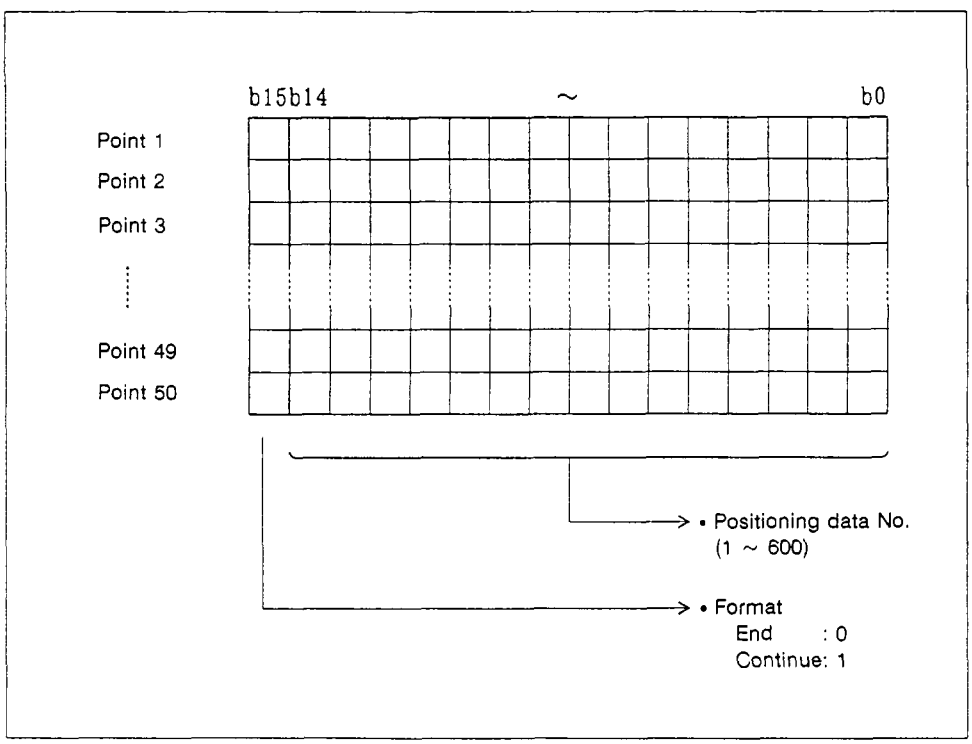
(b) Which point of the positioning start data area to start is designated with the buffer memory for the positioning start point No. setting.

	Buffer memory address
Axis 1	1178
Axis 2	1228
Axis 3	1278

If the run is started without setting the buffer memory for positioning start point No. setting, the run will start from point 1.

(c) The "format" and "positioning data No." are set in the positioning start data.
(Refer to section 3.4.6 for details on the format and positioning data No.)
① Either "End: 0: or "Continue: 1" is set for the format.
② A positioning data No. from 1 to 600 is set in the positioning data No.

(d) The positioning data area is configured as shown below.



[Remarks]

1) * : The data No. for which positioning control is to be executed is set in the positioning data No.

(2) Positioning special start data area

(a) The positioning special start data area is where the AD75 special start is set.
The positioning special start data area corresponds one-on-one with the positioning start data area.

Positioning start data area		Positioning special start data area
Point 1	. . . . .	Point 1
Point 2	. . . . .	Point 2
Point 3	. . . . .	Point 3
Point 49	. . . . .	Point 49
Point 50	. . . . .	Point 50

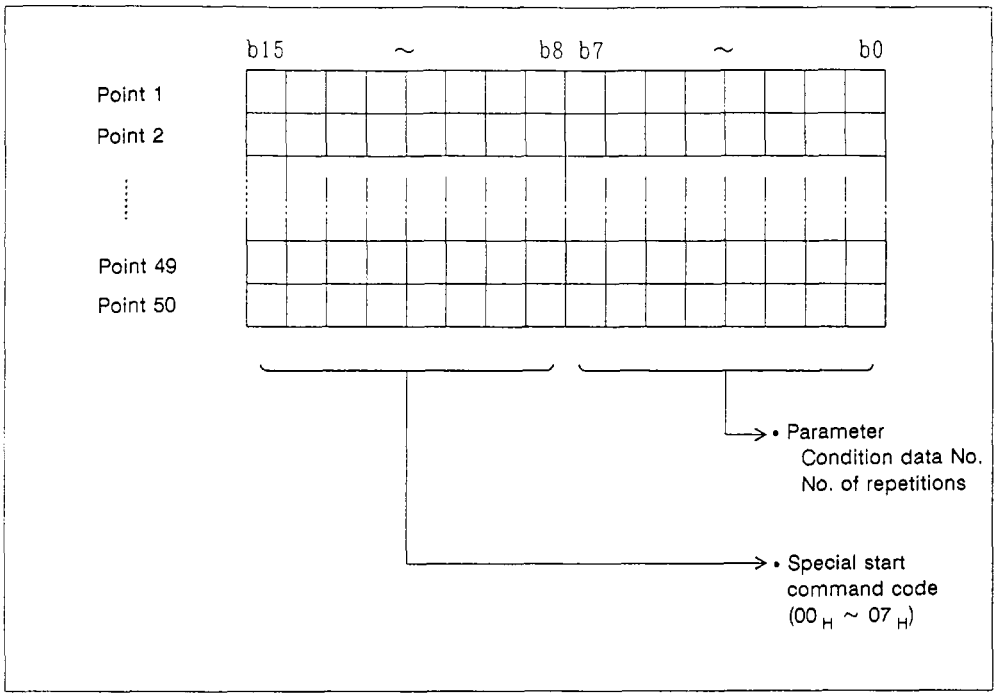
(b) The "special start command code" and "parameter" are set in the positioning special start data area.
(Refer to section 3.4.6 for details on the special start command codes and parameters.)
① The special start starting condition command code (00_H to 07_H) is set for the special start command code.
② The condition data No. or No. of repetitions is set in the parameter.

Special start	Command code	Setting parameter
Normal start	00_H	—
Conditional start	01_H	Condition data No. 1 to 10*
Wait start	02_H	
Simultaneous start	03_H	
Stop start	04_H	—
FOR loop	05_H	No. of repetitions (0 to 255)
FOR condition	06_H	Condition data No. 1 to 10*
NEXT	07_H	—

[Remarks]

1) * : Which of the (3) condition data items to be used is set in the condition data No.

(d) The positioning special start data area is configured as shown below.

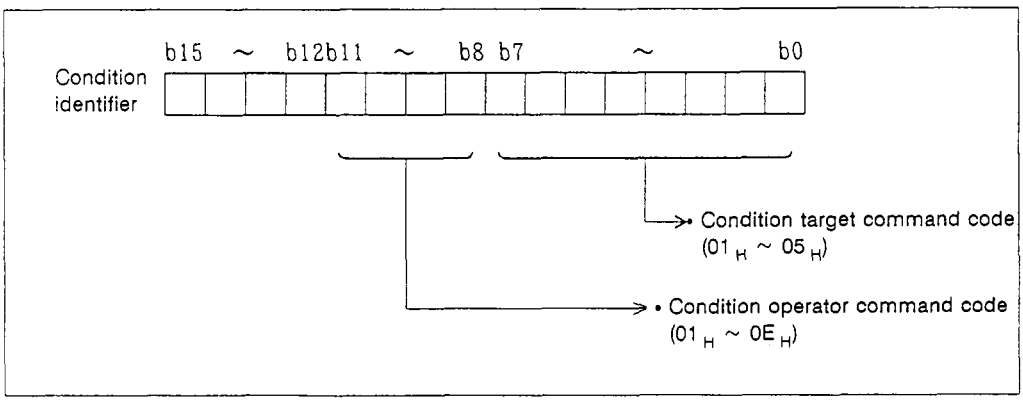


(3) Condition data area

(a) The condition designated with the positioning special start data area parameter is set in the condition data area.
The condition data area has ten areas from 1 to 10.
(Refer to the A1SD75P1/P2/P3, AD75P1/P2/P3 type Positioning Unit User's Manual (Details section), section 3.6.6 for details on the condition data area configuration.)

(c) The following data is set in each item of the condition data area.

① The "condition target command code" and "condition operator command code" are set in the condition identifier.
(Refer to section 3.4.7 (1) for details on the condition target command code and condition operator command code.)

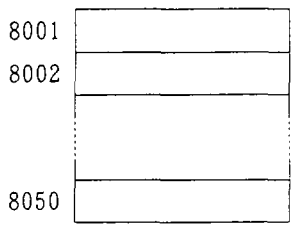


② Refer to section 3.4.7 (2) to (5) for details on the address, parameter 1 and parameter 2.

(4) Indirect designation area

(a) The indirect designation area is used to set different data No. 8001 to 8050 in the positioning data No. 1 to 600.

(b) If 8001 to 8050 is set in the buffer memory (1150, 1200, 1250) for positioning start No. setting, the positioning data stored in the buffer memory corresponding to 8001 to 8050 can be started.
For example, if the positioning data No. 53 is set in the indirect designation area corresponding to 8001, and 8001 is designated in the buffer memory for positioning start No., the positioning data No. 53 can be started.



MITSUBISHI PROGRAMMABLE CONTROLLER

Technical News

Subject: Precautions for replacing A1SD71/AD71 with A1SD75P□/AD75P□, and connections with MR-H/MR-J

Applicable models: A1SD75P1, A1SD75P2, A1SD75P3, AD75P1, AD75P2, AD75P3

Thank you for your continued patronage of the Mitsubishi general purpose sequencer MELSEC-A Series.

The precautions for replacing the A1SD71S2 (S7) type positioning unit/AD71 (S1, S2, S7) type positioning unit with the A1SD75P□ type positioning unit/AD75P□ type positioning unit, and examples for connecting with the MR-H/MR-J type servomotor are explained in this paper.

1. **Precautions for replacing A1SD71/AD71 with A1SD75/AD75**
   The precautions for replacing A1SD71/AD71 with A1SD75/AD75 are described in this section. (Refer to the A1SD75P□/AD75P□ User's Manual (Details Section) for comparisons of the A1SD71/AD71 and A1SD75/AD75 functions.)

   (1) The pulse output logic and connector pin layout differ in the A1SD75/AD75 type. Refer to Technical News PLC-D-245 for details on the pulse output logic.

Item	A1SD75/AD75	A1SD71/AD71
Connector used	Connector: 10136-3000VE Cover : 10336-56F0-008 (Sumitomo 3M)	Connector: FCN-361J040-AU Cover : FCN-360C040-B (Fujitsu)
No. of connectors	One/axis (Enclosed with unit for No. of axes being used)	One/unit
Connector pin layout	The pin Nos. for each axis have the same application.	The X axis or Y axis is designated with the pin No.
Zero point signal specifications	Correspond to DC5V/DC24V (When using MR-H/MR-J, use the DC24V power supply. (Refer to the connection examples.))	Correspond to DC5V to DC24V
Manual pulser model	MR-HDP01 (Mitsubishi Electric)	OSM-01-2(C) (Nemicon)

   (2) When connecting the A1SD75 with peripheral equipment, a convertor cable (A1D75-C01H) is required.

Mitsubishi Electric Corp., Nagoya Works

2. Recommended connections

- The open collector method or differential driver method is used for the A1SD75P□/AD75P□ pulse train output.

- Generally, the differential driver method has a stronger resistance to noise than the open collector method, so connection of the A1SD75P□/AD75P□ to a drive unit with the differential driver method is recommended. However, the load current of the A1SD75P□/AD75P□ differential driver is 20mA, so the differential driver must be used in the above specifications range.

3. Connection with drive unit

- Generally, the drive unit (servo amplifier, stepping motor driver) command pulse input section is photo coupler insulated with the open collector input.
  The connection with the open collector input drive unit will be described below.
- Connection of the A1SD75P□/AD75P□ and drive unit with a differential driver method is recommended to increase the noise margin. (Refer to Fig. 1.)

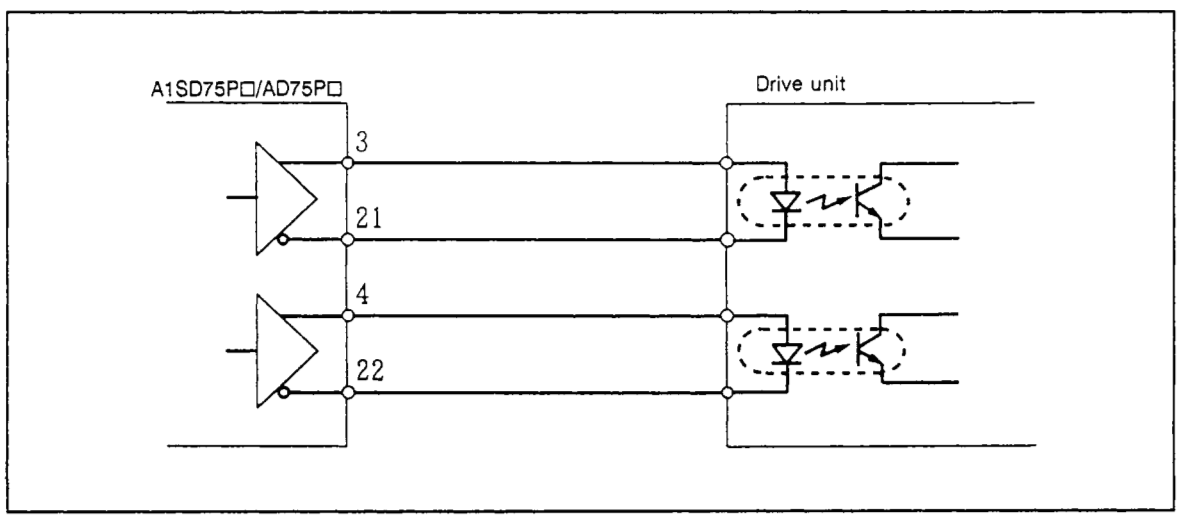


Fig. 1 Example of connection to A1SD75P□/AD75P□ differential driver

Mitsubishi Electric Corp., Nagoya Works

- When connecting the A1SD75P□/AD75P□ and drive unit with an open collector method, wire as shown in Fig. 2.

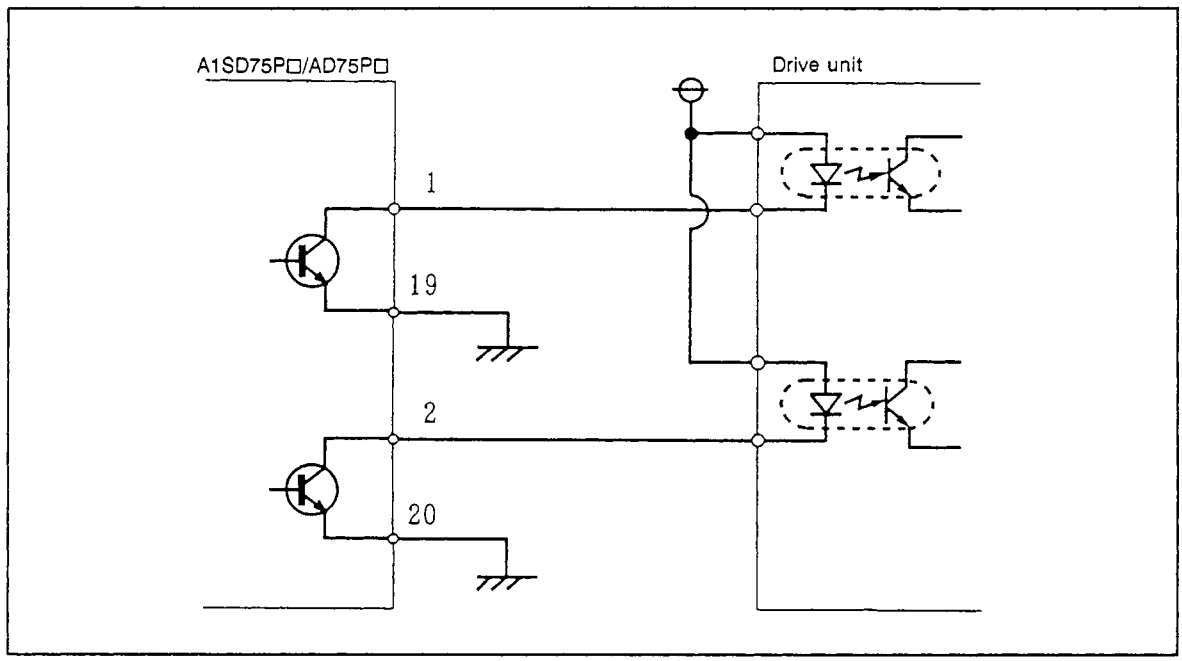


Fig. 2 Example of connection to A1SD75P□/AD75P□ open collector

4. A1SD75P□/AD75P□ command pulse logic

- There are some products that will not accept the command pulse if the command pulse logic does not match at the servo amplifier or stepping motor driver.
- If the A1SD75P□/AD75P□ and servo amplifier/stepping motor driver logic do not match, use a differential driver output, and cross the wiring as shown in Fig. 3.
  In this case, the open collector method cannot be used.

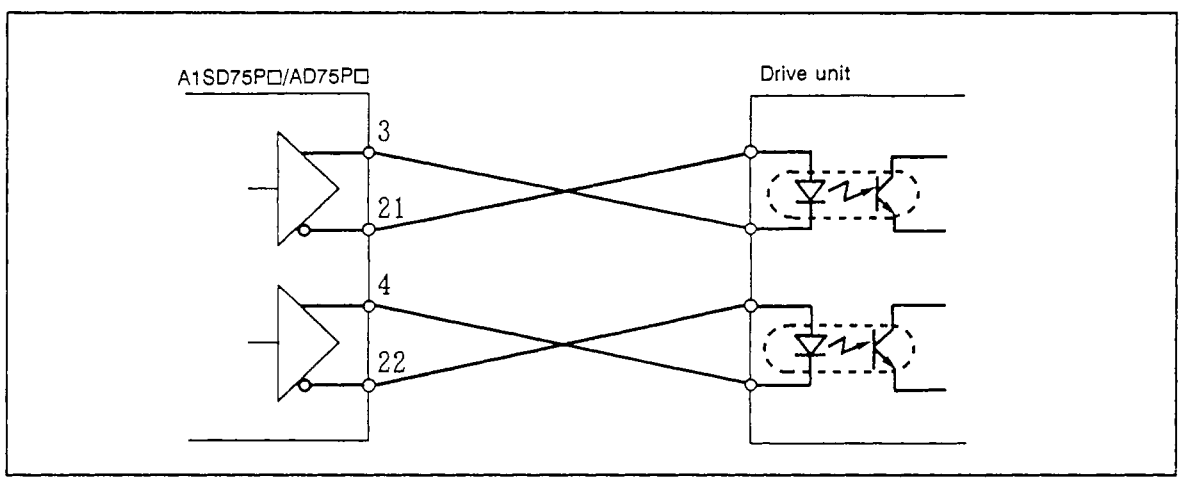


Fig. 3 Example of wiring in which command pulse logic does not mach

- When connecting the A1SD75P□/AD75P□ and a Mitsubishi servo amplifier, the logic can be changed with the servo amplifier parameter settings. However, the normal wiring shown in Figs. 1 and 2 must be used.

Mitsubishi Electric Corp., Nagoya Works

MITSUBISHI PROGRAMMABLE CONTROLLER

Technical News

Subject: External connection wiring for A1SD75P□/AD75P□

Applicable models: A1SD75P1, A1SD75P2, A1SD75P3, AD75P1, AD75P2, AD75P3

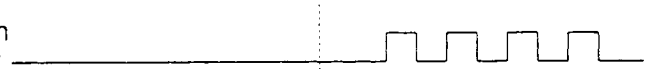
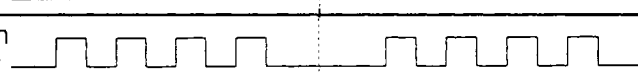
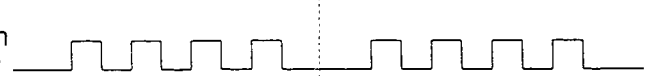
Thank you for your continued patronage of the Mitsubishi general purpose sequencer MELSEC-A Series.

The method for connecting the A1SD75P□ type positioning unit and the AD75P□ type positioning unit with the drive unit will be described in this paper.

1. A1SD75P□/AD75P□ pulse output specifications

- In the A1SD75P□/AD75P□, a pulse train is output to the drive unit and the positioning is controlled.
- The "SING pulse output", "CW/CCW pulse output" and "A phase/B phase pulse output" types are available for the A1SD75P□/AD75P□ pulse outputs. The type to be used is set with the basic parameter 1 of the A1SD75P□/AD75P□.
- The A1SD75P□/AD75P□ pulse outputs are shown in Table 1.

Table 1 A1SD75P□/AD75P□ pulse output

		Forward run	Reverse run
SING pulse output	PULSE		
	SING		
CW/CCW pulse output	PULSE F		
	PULSE R		
A phase/B phase pulse output	A phase		
	B phase		

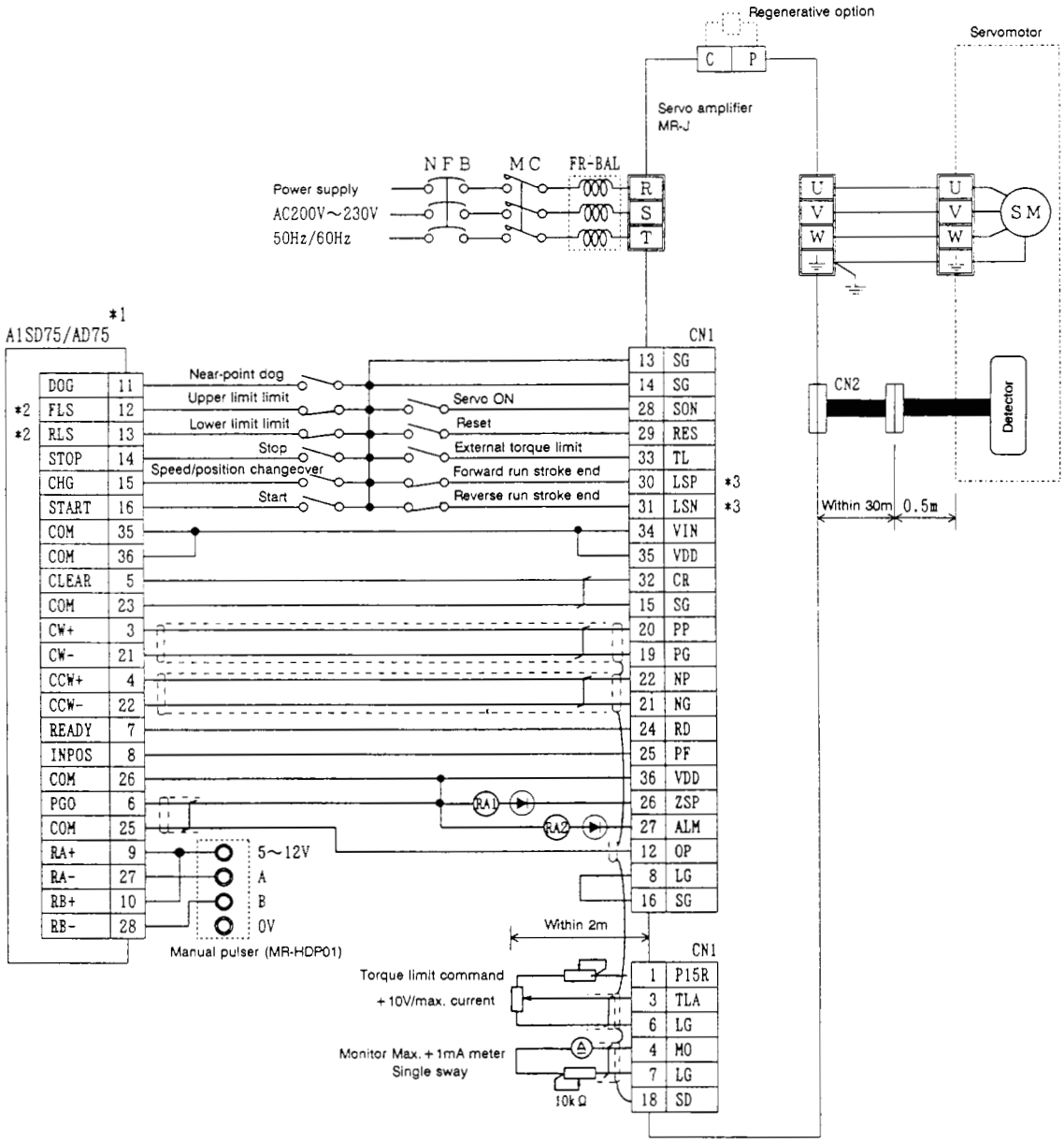
[Remarks]

1) "High" and "Low" for the A1SD75P□/AD75P□ open collector method (transistor output) are as explained below.
   - High: A1SD75P□/AD75P□ pulse output transistor is OFF.
   - LowA1SD75P□/AD75P□ pulse output transistor is ON.

Mitsubishi Electric Corp., Nagoya Works

2. Example of A1SD75/AD75 and MR-J connection

(1) When using differential driver

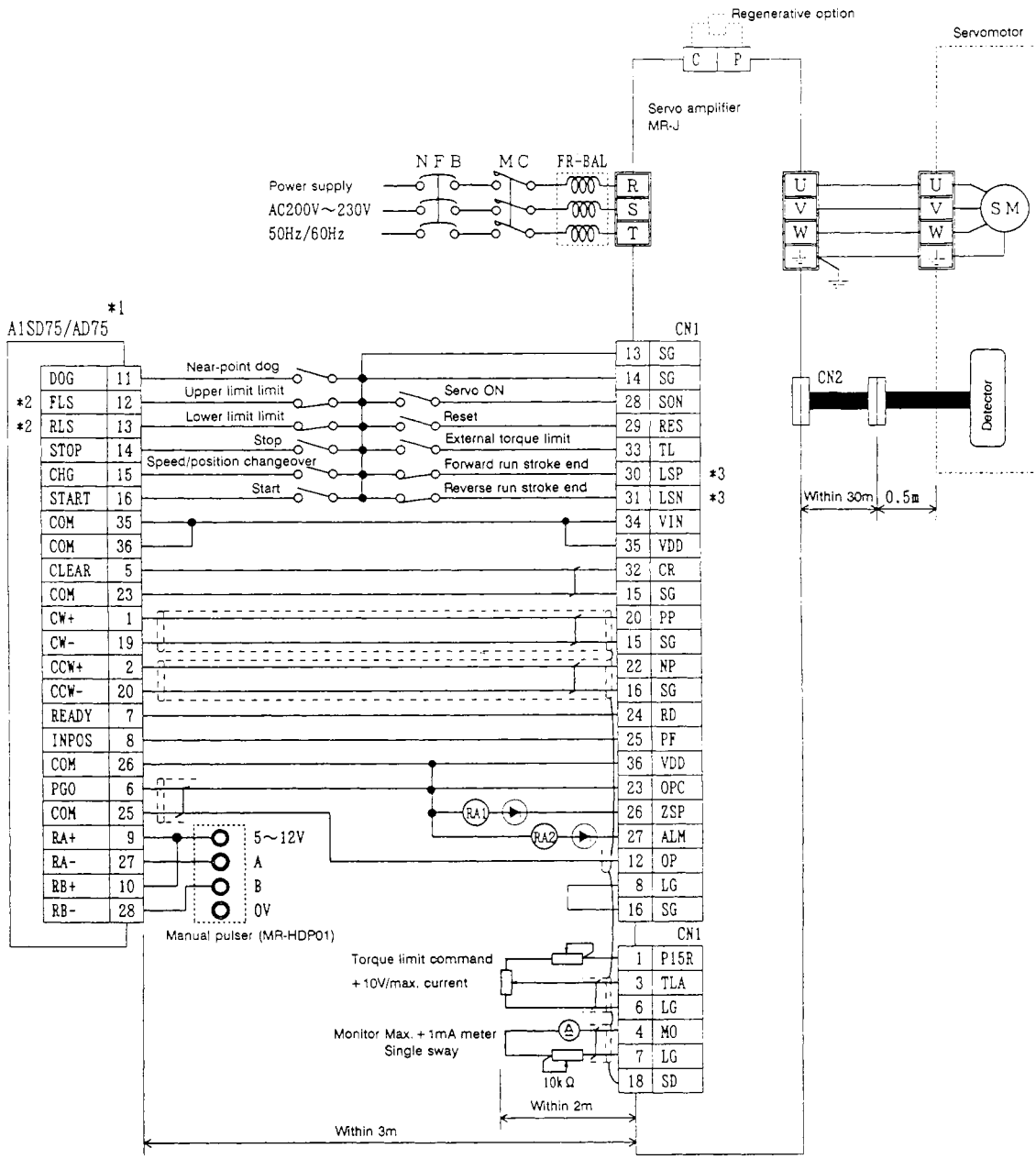


[Remarks]

1) *1: The applications of the A1SD75/AD75 connector pin Nos. are common for axis 1 to axis 3.
2) *2: The A1SD75/AD75 upper limit limit (FLS) and lower limit limit (RLS) are used by the retry function during zero point return. Set these to the inner side with the servo limit switch.
3) *3: This is the limit switch for the servo (for stopping).

Mitsubishi Electric Corp., Nagoya Works

(2) When using open collector



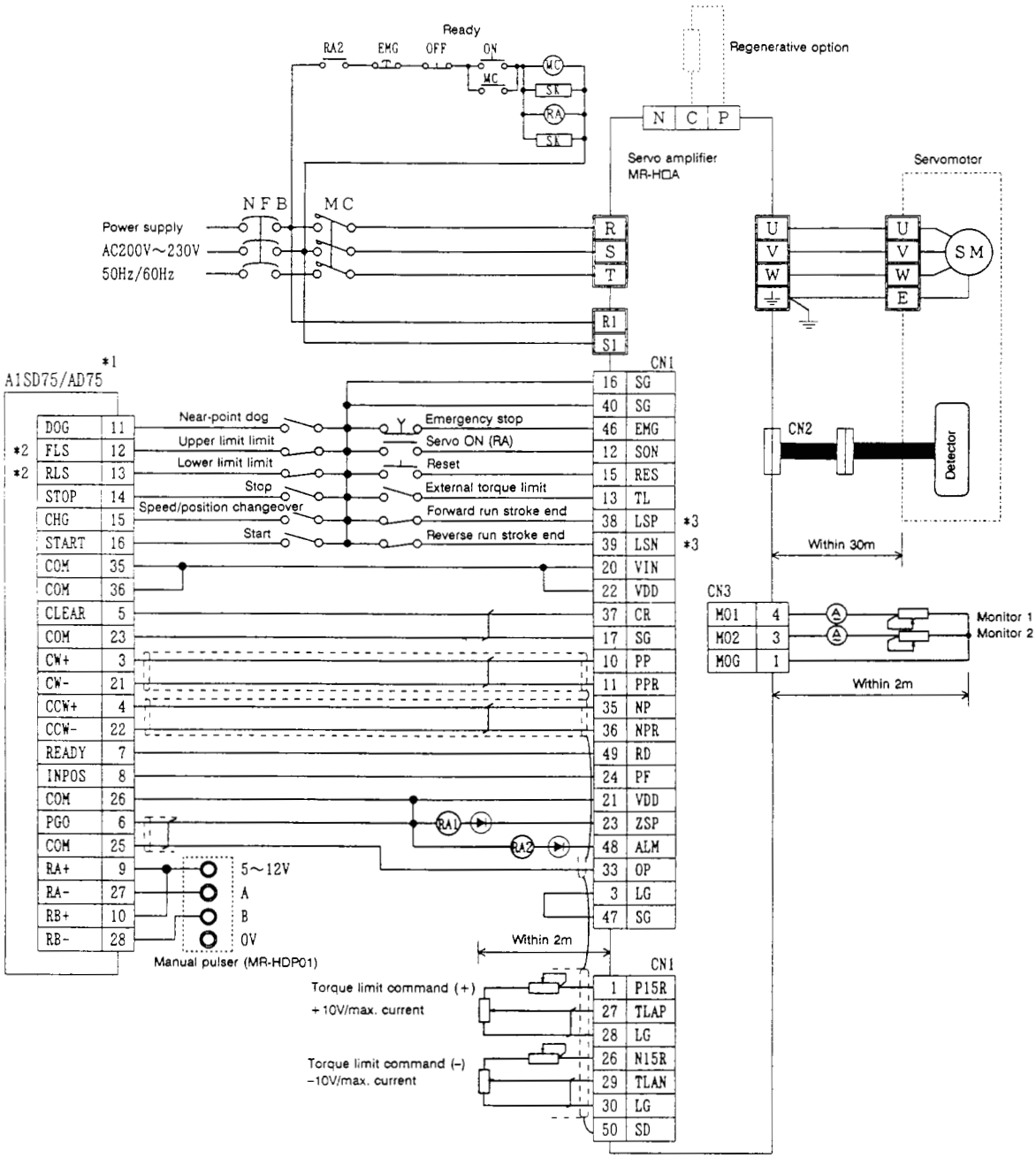
[Remarks]

1) *1: The applications of the A1SD75/AD75 connector pin Nos. are common for axis 1 to axis 3.
2) *2: The A1SD75/AD75 upper limit limit (FLS) and lower limit limit (RLS) are used by the retry function during zero point return. Set these to the inner side with the servo limit switch.
3) *3: This is the limit switch for the servo (for stopping).

Mitsubishi Electric Corp., Nagoya Works

3. Example of A1SD75/AD75 and MR-H connection

(1) When using differential driver

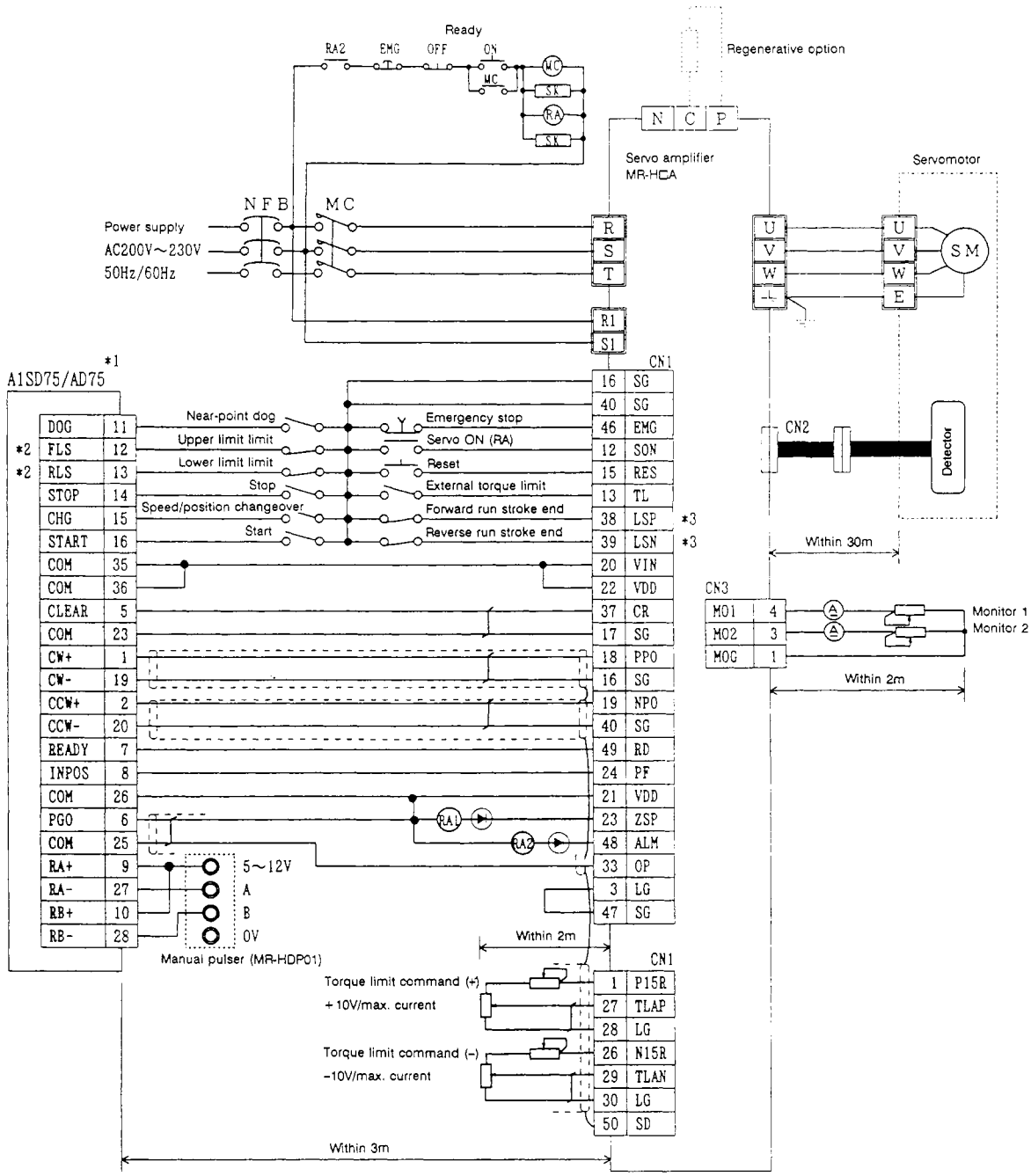


[Remarks]

1) *1: The applications of the A1SD75/AD75 connector pin Nos. are common for axis 1 to axis 3.
2) *2: The A1SD75/AD75 upper limit limit (FLS) and lower limit limit (RLS) are used by the retry function during zero point return. Set these to the inner side with the servo limit switch.
3) *3: This is the limit switch for the servo (for stopping).

Mitsubishi Electric Corp., Nagoya Works

(2) When using open collector



[Remarks]

1) *1: The applications of the A1SD75/AD75 connector pin Nos. are common for axis 1 to axis 3.
2) *2: The A1SD75/AD75 upper limit limit (FLS) and lower limit limit (RLS) are used by the retry function during zero point return. Set these to the inner side with the servo limit switch (*3).
3) *3: This is the limit switch for the servo (for stopping).

Mitsubishi Electric Corp., Nagoya Works

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE MITSUBISHI DENKI BLDG MARUNOUCHI TOKYO 100 TELEX J24532 CABLE MELCO TOKYO
NAGOYA WORKS 1-14 , YADA-MINAMI 5 , HIGASHI-KU , NAGOYA , JAPAN

BCN-P5133-* (9601) MEE Printed in Japan