TECHNICAL BULLETIN

[Issue No.] FA-A-0060-A **[Page]** 1/54
[Title] Procedures for Replacing Positioning Module AD71 with QD75
[Date of Issue] April '09 (Ver.A: May, '10)
[Relevant Models] QD75P□/QD75D□

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

This bulletin is written for those intending to replace the AD71/A1SD71 positioning module with the QD75P□/ QD75D□, including relevant information such as specification changes, method of replacement and recommended equipment such as connectors, cables, etc.

Contents

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Introduction

The performance of the QD75P/QD75D 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 6 to 7ms.
(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 QD75P/QD75D flash ROM; therefore data can be retained without the need for batteries.
(b) The history function enables checking of historical data such as start, errors or warning data.

When using the QD75P/QD75D, it is recommended to also obtain the "GX Configurator-QP" configuration software package. This software provides an easier method to reconfigure positioning data, debug the positioning control system, etc.

In this bulletin, the following generic terms are used to refer to the module names.

Generic term	Model Name
AD71	AD71, AD71S1, AD71S2, AD71S7, A1SD71-S2, A1SD71-S7
AD71S2	AD71S2, A1SD71-S2
AD71S7	AD71S7, A1SD71-S7
QD75 *1	QD75P1, QD75P2, QD75P4, QD75D1, QD75D2, QD75D4
QD75P *1	QD75P1, QD75P2, QD75P4
QD75D *1	QD75D1, QD75D2, QD75D4

*1: The QD75 has two types, namely QD75P□ and QD75D□ ,according to the output types of command pulses. Choose between the two types according to the output type of the AD71 that has been produced. (□ refers to the number of axes.)
• QD75P□: Open collector output
• QD75D□: Differential driver output
In addition, this bulletin uses the notation "QD75P□" and "QD75D□" to refer to the target module requiring unique explanation such as an explanation for different specifications between modules.

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1. Functional comparison between AD71 and QD75

1.1 Table of functional comparisons

The following table shows functional comparisons between the AD71 and QD75. For programs, refer to Chapter 7.

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

Function			AD71				QD75		Compatibility
			AD71	AD71S1	AD71S2 A1SD71-S2	AD71S7 A1SD71-S7	QD75P2	QD75D2	
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 QD75.
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 A1SD71-S2, 1SD71-S7 : 48 points/2 slots		32 points/slot		△ *4
I/O signal lines	Upper/Lower limit switch signal (FLS/RLS input signal)		N/A				Available		External wiring is required for QD75.
	START signal (Output signal)		Available				N/A		× *5
	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)				0.46A	0.56A	–

*1: A manual pulse generator is equipped with a module, QD75.
For further details, refer to Section 11.4 “Manual pulse generator operation” of the Type QD75P/QD75D Positioning Module User's Manual.

*2: The QD75 substitutes electronic gears.

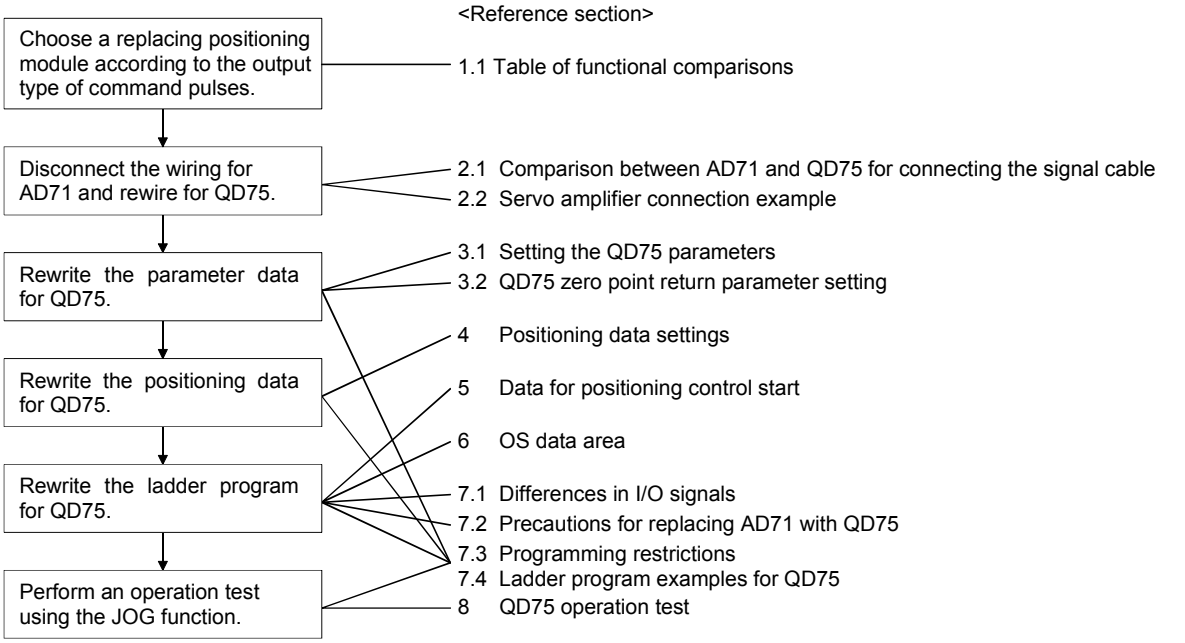
*3: No. of writes to flash ROM is up to 100,000.

*4: Configure the StartXY address in the I/O assignment tab of the PC parameter to keep the address unchanged, when replacing the A1SD71-S2 and A1SD71-S7.

*5: Use an output module and create a ladder program that enables the signal. (Refer to Section 2.2 “Servo amplifier connection example (10)”)

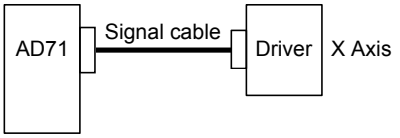
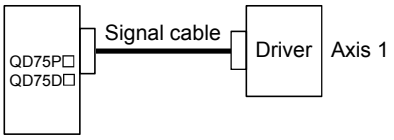
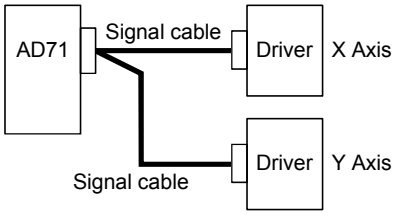
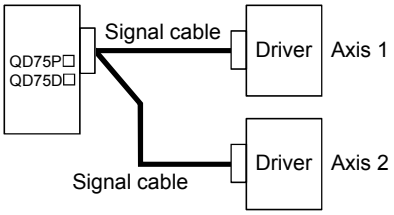
1.2 Replacement procedure flowchart

This flow chart shows the prcedures to replace the AD71 with the QD75. This bulletin provides relevant explanations in the order shown below.



2. Rewiring

2.1 Comparison between AD71 and QD75 for connecting the signal cable

	AD71	QD75
1-axis control	 AD71 signal connector (40-pin) is usable for X and Y axes.	 QD75 signal connector (40-pin) has two types, one is for Axis 1 and Axis 2 and another is for Axis 3 and Axis 4.*2
2-axis control	 AD71 signal connector (40-pin) is usable for X and Y axes (Bifurcated type cable).	 QD75 signal connector (40-pin) has two types, one is for Axis 1 and Axis 2 and another is for Axis 3 and Axis 4.*2
Connector type*1	Connector Connector cover) Set: A6CON Manufacturer: Mitsubishi Electric Corp.	Connector : Connector cover:) Set: A6CON Manufacturer : Mitsubishi Electric Corp.z

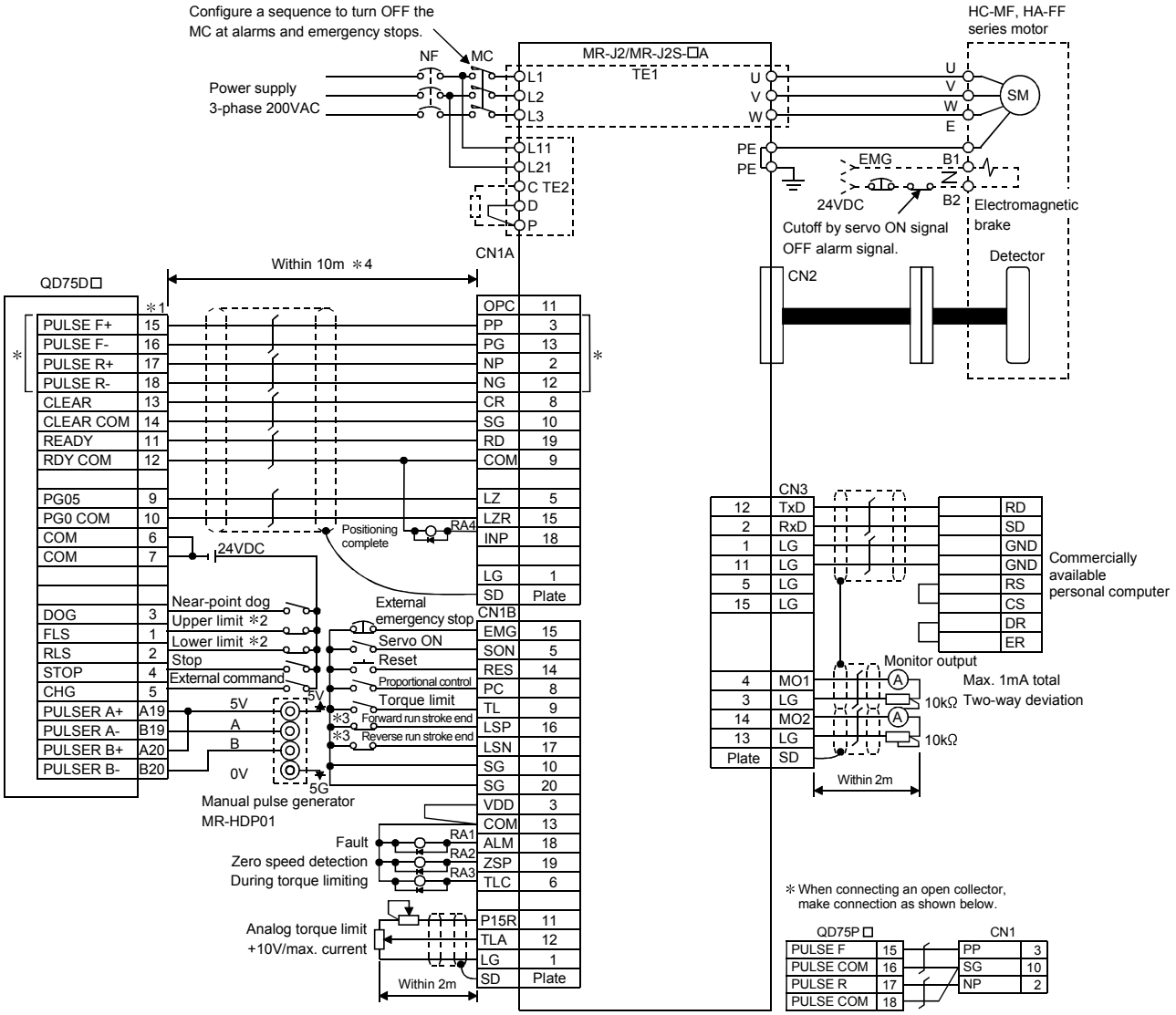
*1: The connector and connector cover are included with the AD71. They are not included with the QD75, but sold separately.

*2: Both QD75P4 and QD75D4 have two types of signal connectors. One connector is used for Axis 1 and Axis 2, and another is used for Axis 3 and Axis 4.

New signal cables are required for the QD75, as the signal specifications for the external connection are different from the AD71.

2.2 Servo amplifier connection example

Connection example with the servo amplifier (MR-J2/J2S-□A(Differential driver))



(1) For the pulse output, choose either the open collector or the differential driver depending on the external device.
It is recommended to make differential driver connection since differential driver connection is more excellent than open collector connection in max. output pulse and max. connection distance between servos. (Refer to Section 3.1 "Performance specifications".)
(Refer to Section 3.1 "Performance specifications" of the Type QD75P/QD75D Positioning Module User's Manual.)

(2) *1: The logic for each I/O terminal can be changed with "Pr.22 Input signal logic selection" and "Pr.23 Output signal logic selection" in detailed parameters 1. (Negative logic is used for all terminals in the diagram shown in the previous page.)

(3) *2: The QD75D□ upper limit (FLS) and lower limit (RLS) are used in the OPR retry function. Set these signals inside the servo amplifier limit switches.
When not using the upper limit signal (FLS) and the lower limit signal (RLS) of the QD75D□, perform the following.
(If the following operation is not performed, an error (error code: 104 or 105) will occur at start-up.)

(a) When wiring the upper limit signal (FLS) and the lower limit signal (RLS)
When setting "Negative logic" (default) for "Pr. 22 Input signal logic selection" in Detailed parameters 1, connect a 24VDC external power supply.

(b) When not wiring the upper limit signal (FLS) and the lower limit signal (RLS)
Set "Positive logic" for "Pr. 22 Input signal logic selection" in Detailed parameters 1.
(Refer to Section 12.4.4 "Hardware stroke limit function[4] " of the Type QD75P/QD75D Positioning Module User's Manual.)

(4) *3: These are limit switches for the servo amplifier (for stop).

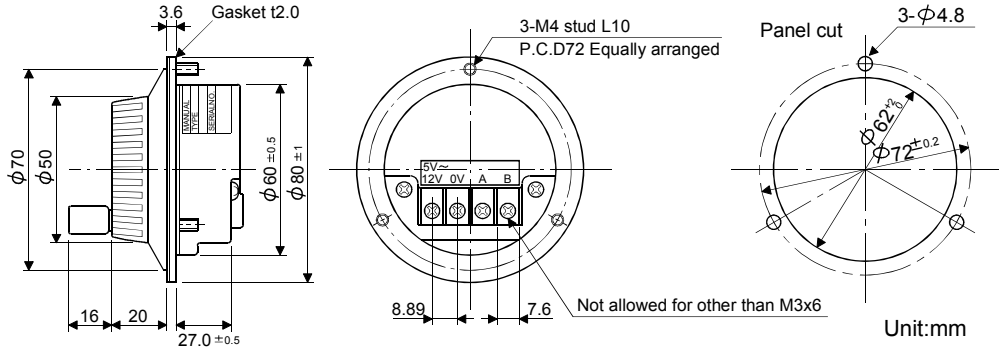
(5) *4: This indicates the distance between the QD75D□ and servo amplifier.

(6) *5: Use the same logic (positive logic/negative logic) for the QD75D□ and servo amplifier. The QD75D□ is initially set to negative logic.

(7) The FA-CBLQ75M2J2(-P) cable can be used for the connection between the QD75D□ and MR-J2/J2S-□A.
(Refer to Section 2.2 "Configuration list" of the Type QD75P/QD75D Positioning Module User's Manual.)

(8) The manual pulse generator for the AD71 is not compatible with the QD75D□, therefore it is recommended to use one designed for the QD75D□. (Recommended: Mitsubishi Electric Corp. MR-HDP01)
The input pulse from the manual pulse generator (MR-HDP01) is counted in multiples of 4.

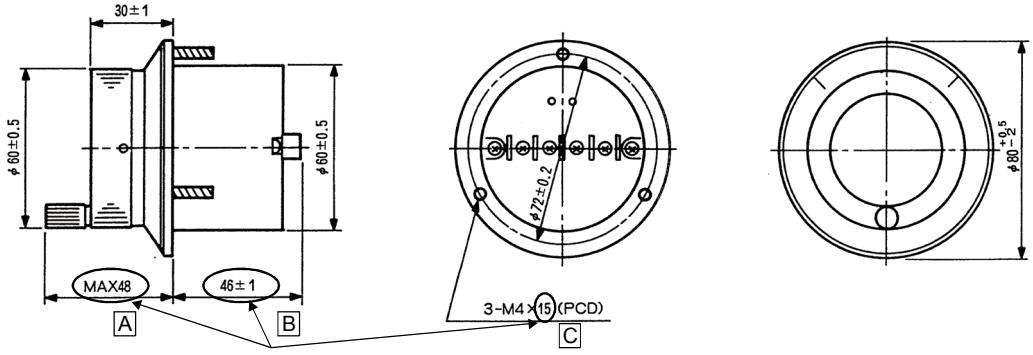
(MR-HDP01 External Dimensions)



The difference between the AD71 and QD75D□ manual pulse dimensions can be seen at the three places, dimensions A, B, and C shown in Reference in the next page.
Please pay attention when replacing them.

Reference

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



(9) Although for the AD71S2 the speed/position switching enable signal (1A, 1B) is used, for the QD75 write data to the Speed/position changeover enable flag Cd.24 , in order to switch between speed/position.

(10) When the START signal (for releasing mechanical brakes) (11A and 11B) of the AD71 are used, connect the AD71 to an output module (such as the QY40P) that outputs a signal (Y□) and enable the START signal with a ladder program (for releasing mechanical brakes).
Please select an appropriate output module suitable for your system.

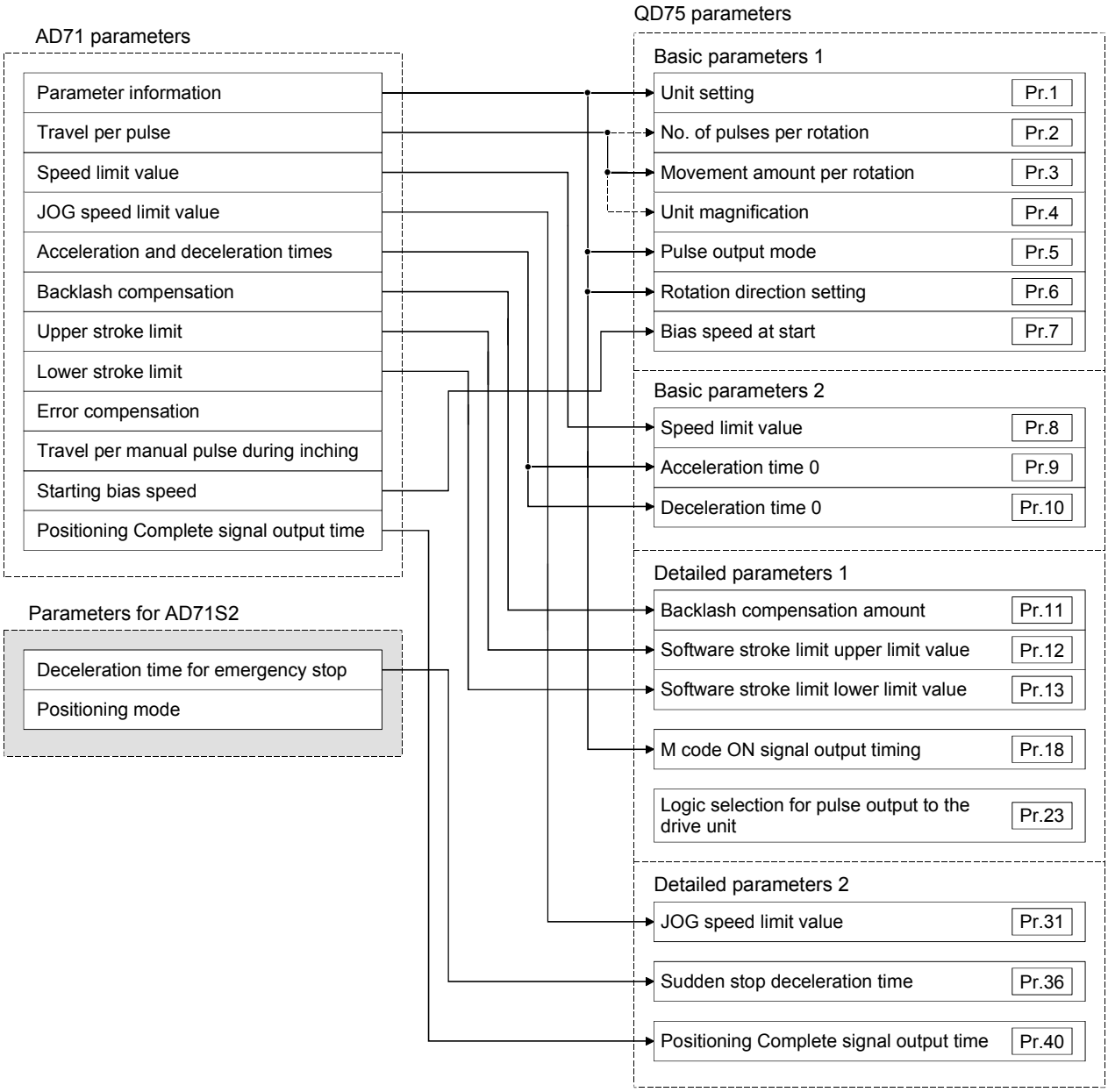
The following table shows specifications of the AD71 START signal and main output modules used for the QD75.

	START signal of AD71	Output module used for the QD75		
		QY10	QY40P	QY70
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 28.8V DC	4.5 to 15V DC
Load current	10mA (Max.)	2A	100mA	16mA

3. Parameter Settings

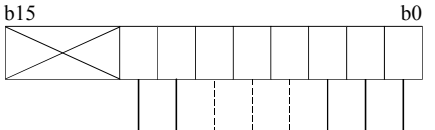
3.1 Setting the QD75 parameters (Correlation of AD71 and QD75 parameters)

Set the QD75 parameters corresponding to the AD71 parameters.



For details on the QD75 parameters, refer to Section 5.2 “List of parameters” of the Type QD75P/QD75D Positioning Module User's Manual

(1) Parameter information

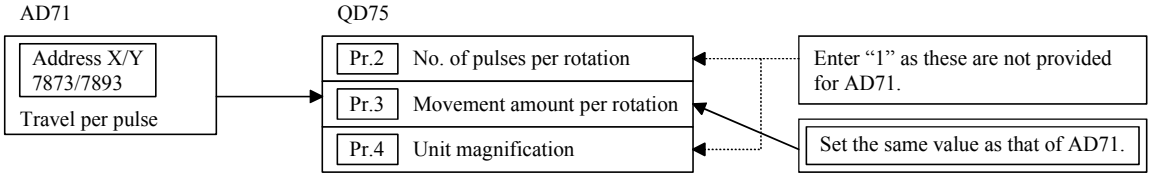


AD71 Address X/Y 7872/7892	QD75
Unit setting 00: mm 01: inch 10: degree 11: pulse	Pr.1 Unit setting 0: mm 1: inch 2: degree 3: pulse
Rotation direction setting 0: Current value increment with forward run pulse output 1: Current value increment with reverse run pulse output	Pr.6 Rotation direction setting 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 mode 1: CW/CCW mode 2: A phase/B phase mode (For multiple of 4) 3: A phase/B phase mode (For multiple of 1)
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.18 M code ON signal output timing 0: WITH mode 1: AFTER mode

(Example) Unit setting: pulse
Pulse output mode: CW/CCW mode
Rotation direction setting: Current value increment with forward run pulse output
M code ON timing: WITH mode

AD71	QD75	
bit:10000011	Basic parameters 1	Unit setting: 3 (Pulse) Pulse output mode: 1 (CW/CCW mode) 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



When using the error compensation function of the AD71, refer to Section 12.3.2 "Electronic gear function" of the Type QD75P/QD75D Positioning Module User's Manual to set "No. of pulses per rotation", "Movement amount per rotation" and "Unit magnification".

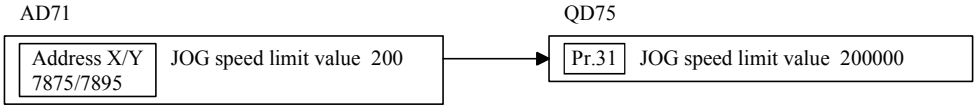
(3) Speed limit value, JOG speed limit value, Bias speed at start

The units for the Speed limit value, JOG speed limit value and Bias speed at start of the AD71 and QD75 differ as shown in the following table.

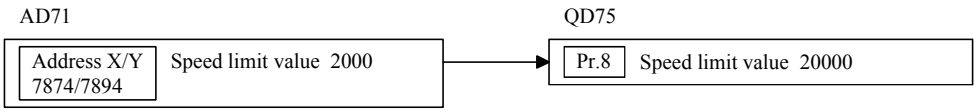
	Unit			
	mm	**inch**	**degree**	**pulse**
AD71	$\times 10^{1}$ mm/min	$\times 1$ inch/min	$\times 1$ degree/min	$\times 10^{1}$ pulse/s
QD75	$\times 10^{-2}$ mm/min	$\times 10^{-3}$ inch/min	$\times 10^{-3}$ degree/min	$\times 10^{0}$ pulse/s
Multiplication factor*1	× 1000	× 1000	× 1000	× 10

*1: For the QD75, 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



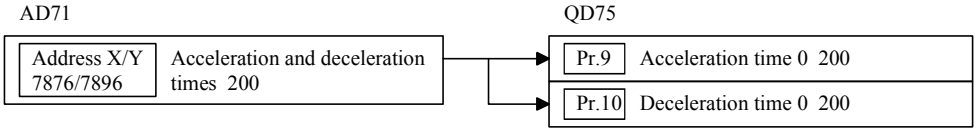
(Example) Unit: pulse Speed limit value 20000 pulse/s



(4) Acceleration and deceleration times

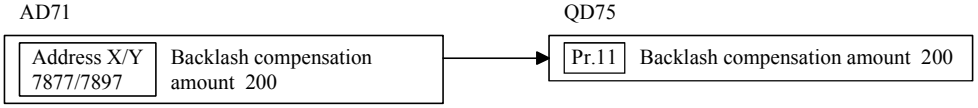
For the "Acceleration and deceleration times" of the AD71, enter the same value into both the "Acceleration time 0" and "Deceleration time 0" of the QD75 Basic parameters 2.

(Example) Acceleration and deceleration times 200ms



(5) Backlash compensation amount

(Example) Unit: pulse Backlash compensation amount 200

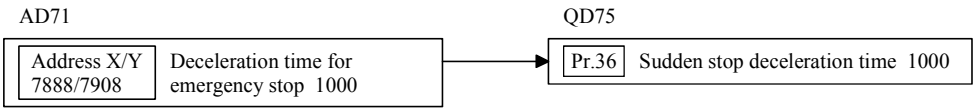


(6) Travel amount per pulse of manual pulse generator

The QD75 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.20 "Manual pulse generator 1 pulse input magnification", refer to Section 11.4 "Manual pulse generator operation" of the Type QD75P/QD75D Positioning Module User's Manual.

(7) Emergency stop deceleration time (for AD71S2)

With the Deceleration time for emergency stop of the AD71S2, set the same value to Pr.36 "Sudden stop deceleration time" of the QD75 Detailed parameters 2.
For further details, refer to Section 6.5.6 "Stop program" of the Type QD75P/QD75D Positioning Module User's Manual.



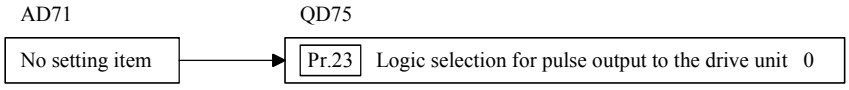
(8) Positioning mode (for AD71S2)

The position control mode, speed/position switching mode and speed control mode are set in the positioning mode of the AD71S2. For the QD75, set the modes by using the positioning identifier of the positioning data.

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

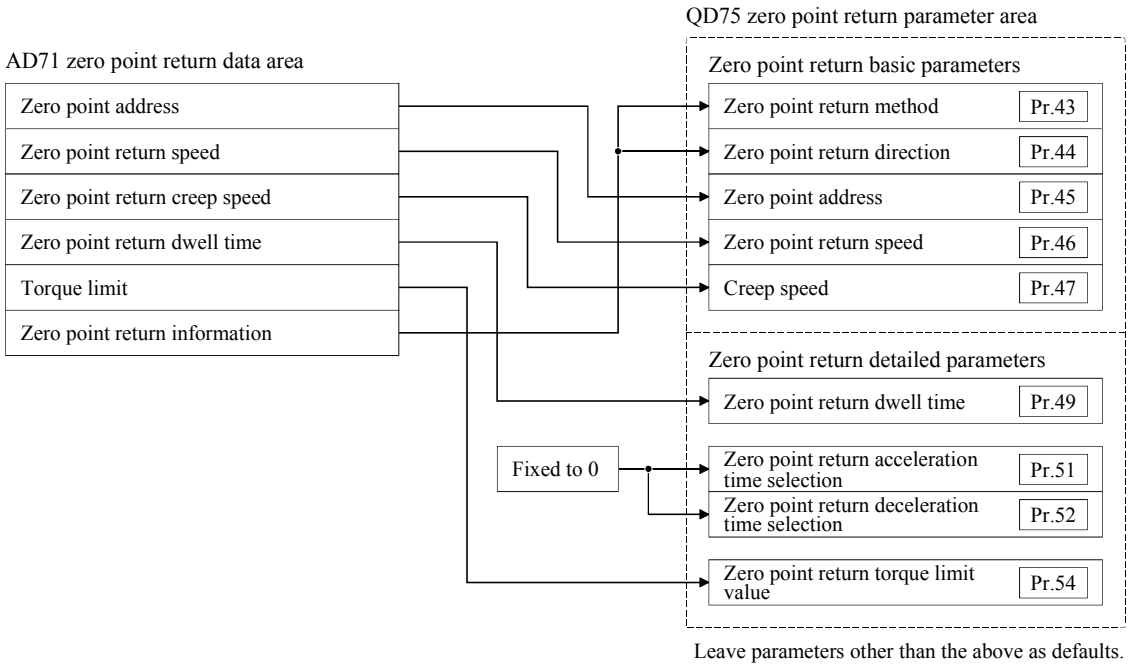
No setting item is provided for the AD71 because only negative logic output is available.
For the QD75, set it to "0" to select negative logic.

0: Negative logic 1: Positive logic



3.2 QD75 zero point return parameter setting

Set the QD75 zero point return data corresponding to the AD71 data.

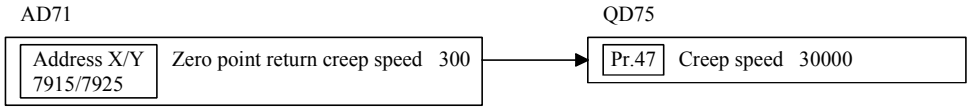


Leave parameters other than the above as defaults.

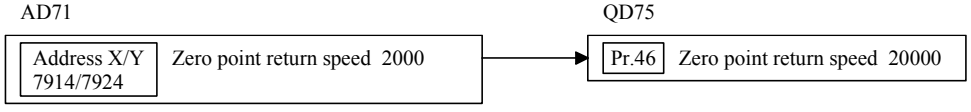
(1) Zero point return speed, Zero point return creep speed

For the QD75, multiply the AD71 data by a 1000 for "mm", "inch" or "degree", or by 10 for "pulse".
For the multiplication factor, refer to Section 3.1 (3) “Speed limit value, JOG speed limit value, Bias speed at start”.

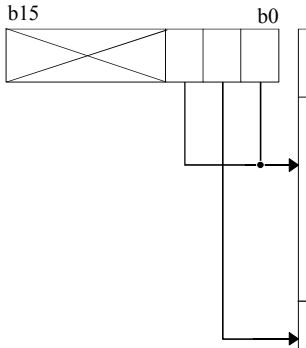
(Example) Unit: mm Zero point return creep speed 300 mm/min



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

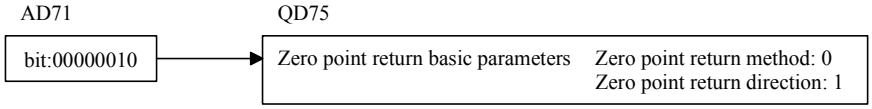


(2) Zero point return information



AD71 (Address X/Y 7918/7928)	QD75
Zero point return method 00: Pulse generator zero point signal method 01: Stopper method 1 (Time-out of the dwell timer) 10: Stopper method 2 (Signal from the drive unit)	Pr.43 Zero point return method 0: Near-point dog method 1: Stopper stop method 1) 2: Stopper stop method 2) 3 : Stopper method 3) 4 : Count method 1) 5 : Count method 2)
Zero point return direction 0: Positive direction 1: Negative direction	Pr.44 Zero point return direction 0: Positive direction (address increment direction) 1: Negative direction (address decrement direction)

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

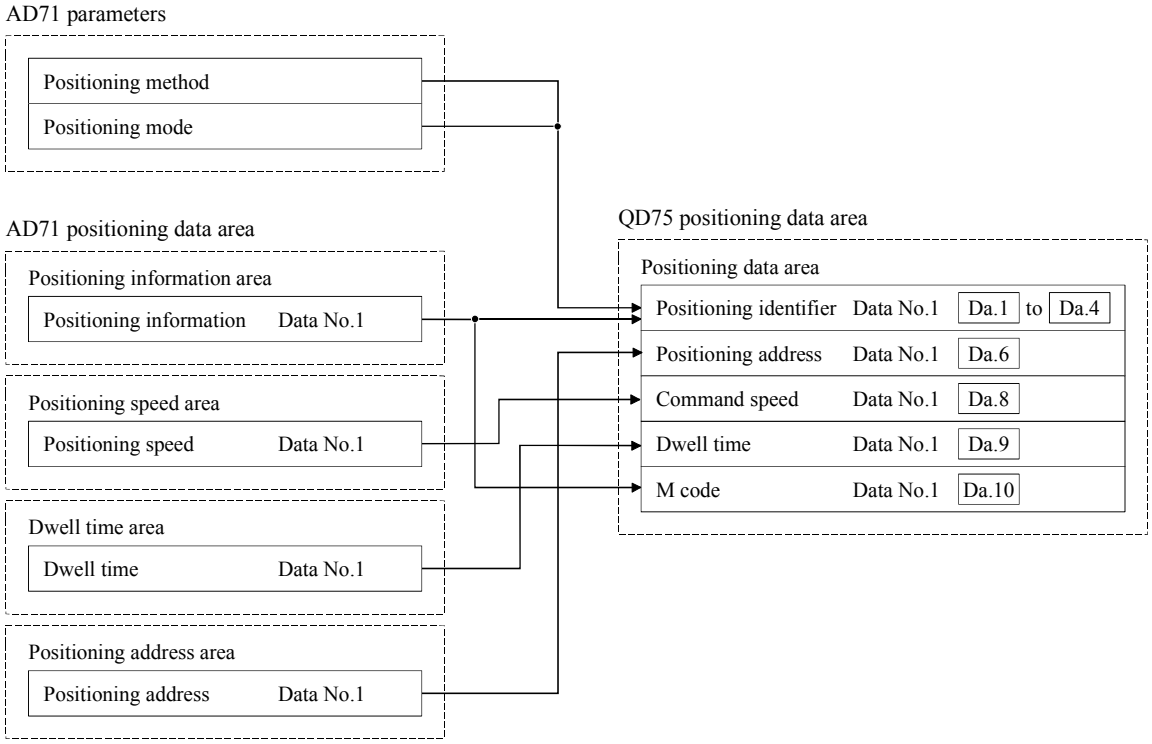


(3) Zero point return acceleration time selection/ Zero point return deceleration time selection

These items are required to be set for the QD75 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.)

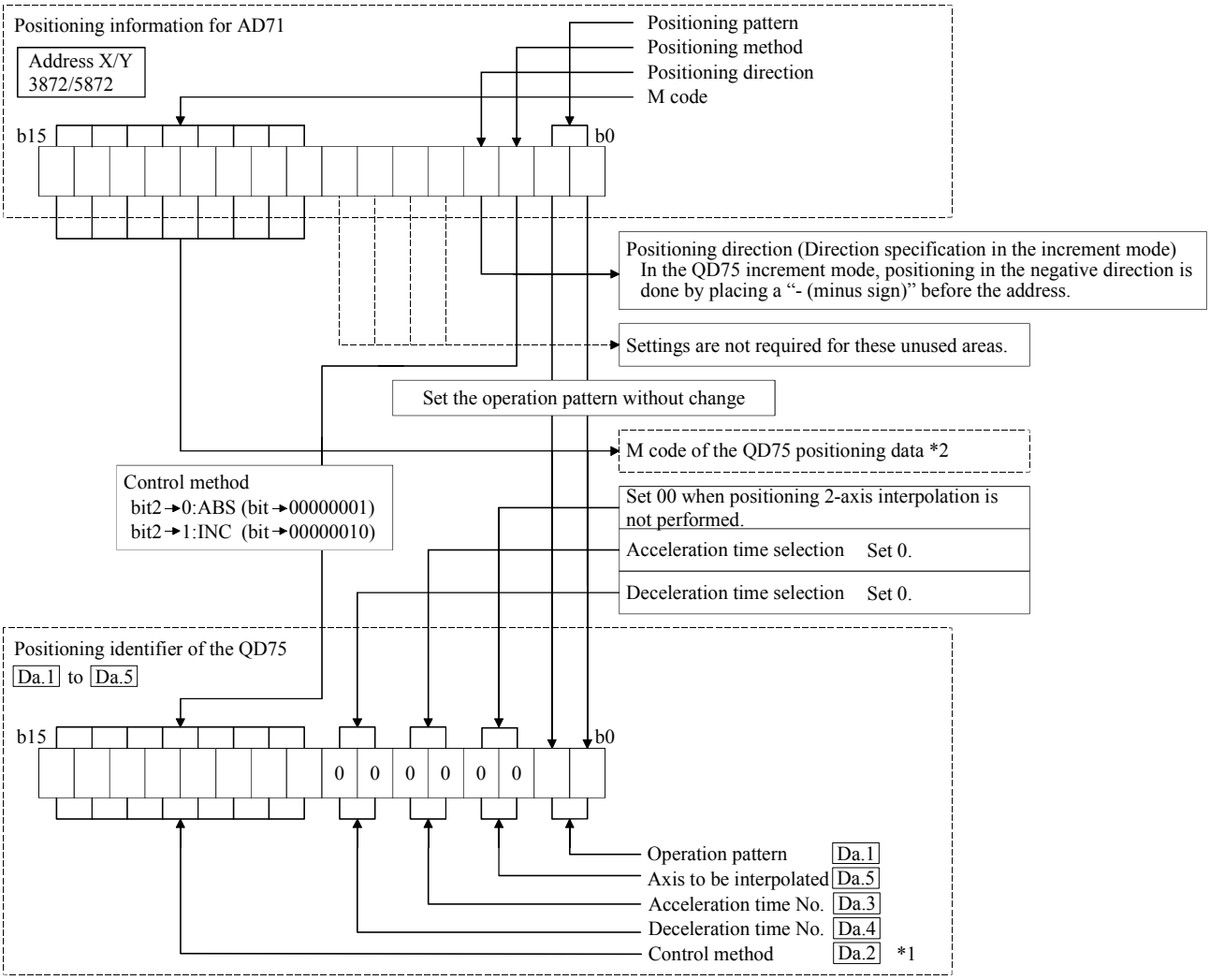
4. Positioning data settings

The positioning data stored in the QD75 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 QD75 data. (The data of Da.5 "Axis to be interpolated" and Da.7 "Arc address" are omitted from the following QD75 positioning data area.)



(1) Positioning information

Positioning pattern, positioning method, positioning direction and M code

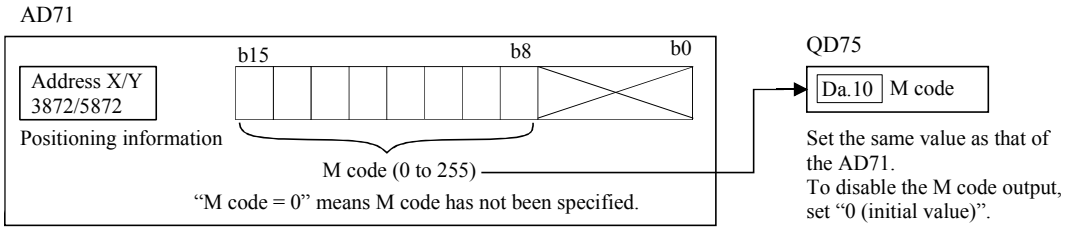


*1: Control method setting

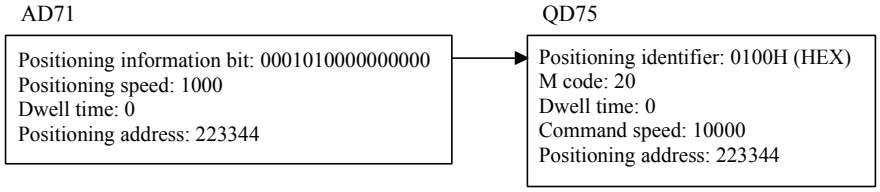
In the QD75, the positioning control (e.g. linear/circular interpolation), speed control, speed/position switching control is specified in the control method setting, which enables each positioning data to be set individually.

*2: M code

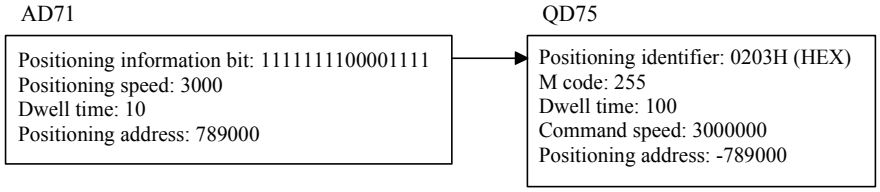
The range of settable values for the QD75 is expanded. Therefore, the values can be set from 0 to 65535.
Setting the same values (0 to 255) as values for the AD71 controls the QD75 equivalently.



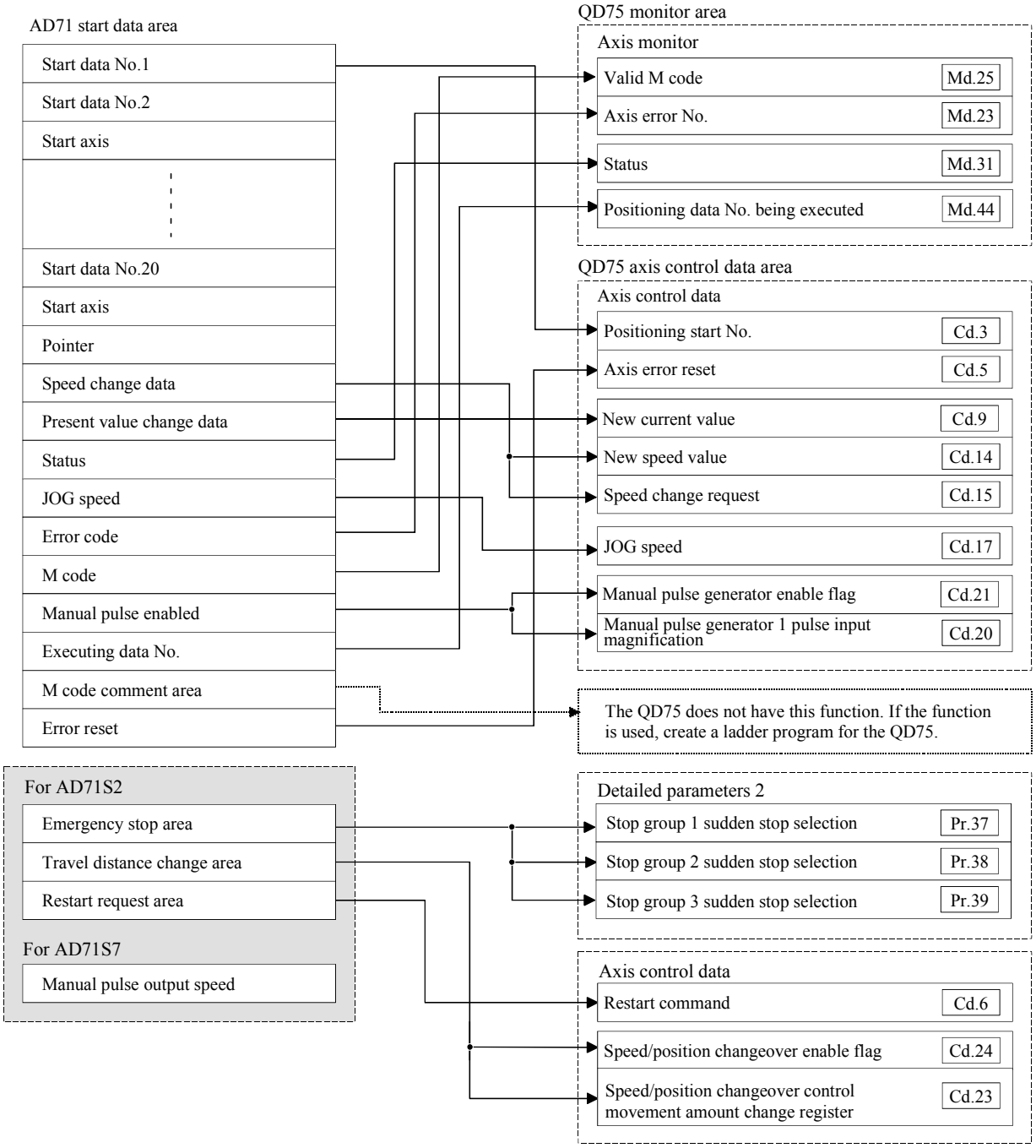
(Example 1) Positioning pattern: Positioning end
Positioning method: Absolute
M code: 20
Positioning speed: 10000 pulse/s
Dwell time: 0
Positioning address: 223344 pulses



(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



5. Data for positioning control start

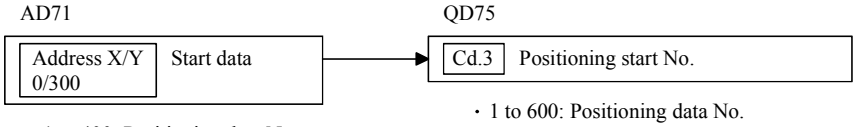


To enable the continuous positioning using the AD71 pointers, use the block start function. For further details, refer to Section 10.3.2 “Block start (normal start)” of the Type QD75P/QD75D Positioning Module User's Manual.

(1) Start data No.

The number of positioning data to be used is set in the Cd.3 "Positioning start No." of the QD75.

(Setting example)



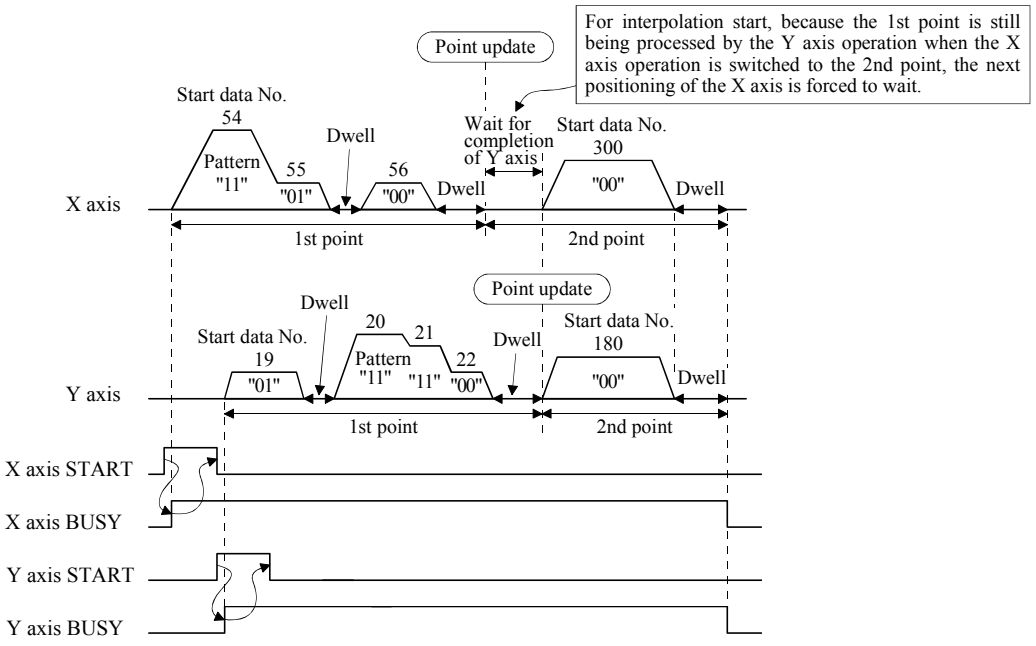
・ 1 to 400: Positioning data No.

・ 1 to 600: Positioning data No.
・ 7000 to 7004: Block start specification
・ 8001 to 8050: Indirect specification
・ 9001: Machine zero point return
・ 9002: High-speed zero point return
・ 9003: New current value
・ 9004 : Multiple axes simultaneous start

CAUTION

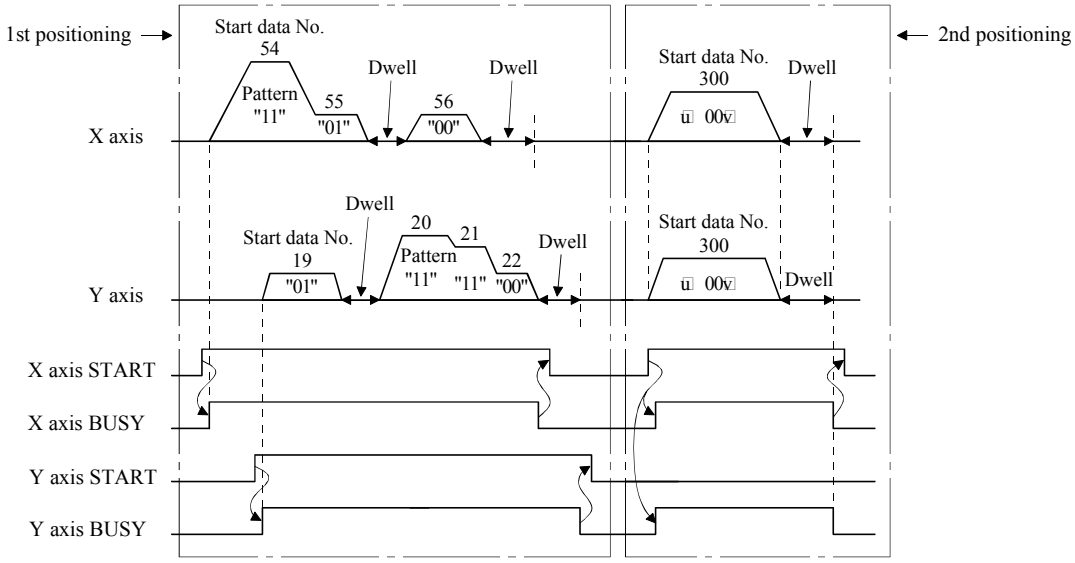
For continuous positioning set using pointers, when the interpolation start or both-axis start is set for the next point, the AD71 does not start the next point until the current positioning of both axes is completed.

(a) For the AD71



The above method is not supported by the QD75. (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 QD75, separate the start of the positioning into two instances (as shown in the diagram "(b) For the QD75"). 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.

(b) For the QD75



(2) Speed change data

The method for this is different between the QD75 and AD71. Therefore, to change the speed for the QD75, set a new speed value in the axis control data area and set "1" to the "Speed change request".

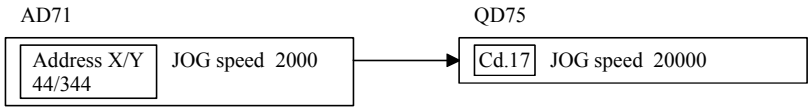
(3) New current value

The method for this is different between the QD75 and AD71. For the QD75, 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 QD75. 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



(5) Manual pulse enabled

The manual pulse enabled function of the AD71 can be set with Cd.21 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, while for the QD75 the error reset is set in Cd.5 for each axis independently. Therefore, for the QD75 create a ladder program that enables to reset the error for each axis.

(7) Emergency stop area (for AD71S2)

To retain the emergency stop function of the AD71S2, set "1: Sudden stop" to both Pr.38 Stop group 2 sudden stop selection and Pr.39 Stop group 3 sudden stop selection in the QD75's detailed parameters 2.

For further details, refer to Section 5.2.4 "Detailed parameters 2" of the Type QD75P/QD75D Positioning Module User's Manual.

0: Normal decelerated stop 1: Sudden stop

AD71S2 stop factor	Setting on QD75
Emergency stop triggered by external input	• Set the same time value as the AD71S2 deceleration time for emergency stop (address 7888/7908) to Pr.36 Sudden stop deceleration time. • Set "1: Sudden stop" to Pr.39 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 Pr.28 Deceleration time. • Set "1: Deceleration time 1" to Pr.33 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 QD75 Cd.23 "Speed/position changeover control movement amount change register". Note that different methods are used for the AD71S2 and QD75 to enable the speed/position switching. For the AD71S2 it is enabled by external input, where as for the QD75 it is set with Cd.24 Speed/position changeover enable flag.

(9) Restart request area (for AD71S2)

The QD75 will resume the positioning from the stopped position to the positioning data end point, when "1" is set in Cd.6 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 QD75.
For the QD75, the command output during the manual pulse generator operation is as follows:

[No. of command pulses]

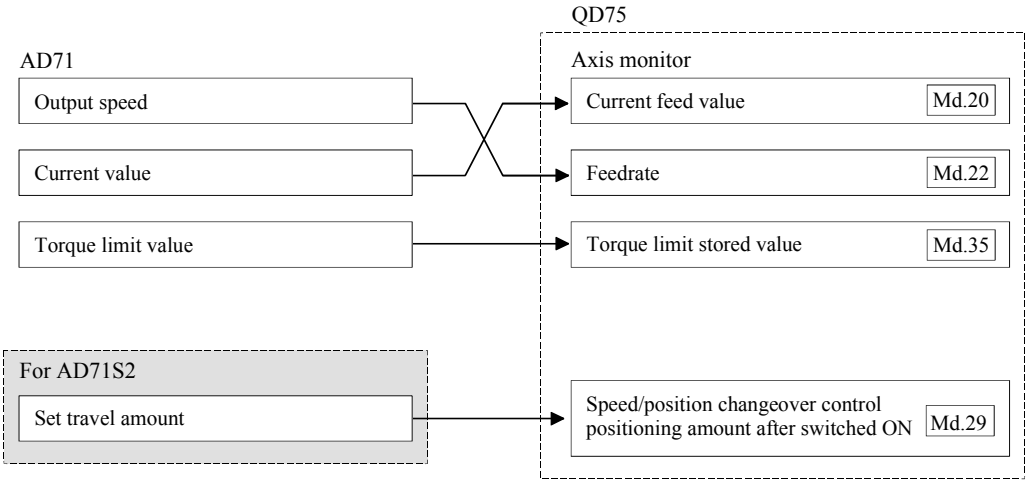
= (No. of input pulses of manual pulse generator) x (Cd.20 Manual pulse generator 1 pulse input magnification)

[Command frequency]

= (Manual pulse generator input frequency) x (Cd.20 Manual pulse generator 1 pulse input magnification)

The speed during the manual pulse generator operation in the QD75 is not limited by Pr.8 Speed limit value.

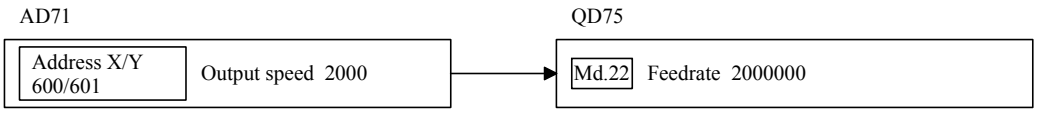
6. OS data area (Including monitor information)



(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 QD75.

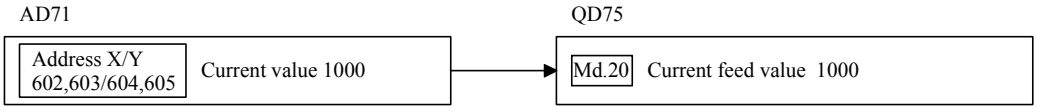
(Example) Unit: mm
Feed rate: 20000 mm/min



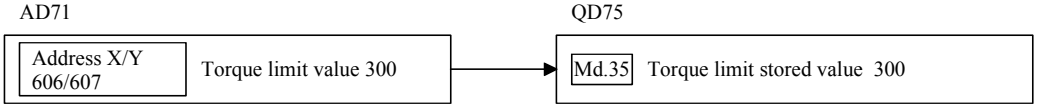
(2) Current value, Torque limit value and Set movement amount

The QD75 and AD71 stores the same values.

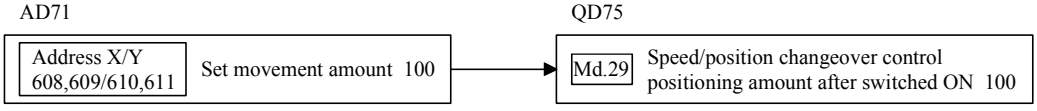
(Example) Current value: 1000 pulses



(Example) Torque limit value: 300%



(Example) Set movement amount: 100 pulses



7. Positioning control program

7.1 Differences in I/O signals

AD71	QD75
Watchdog timer error (X0)	No watchdog timer error signal is provided. When a watchdog timer error occurs, QD75 Ready (X0) turns ON.
Zero point return request (X6, X7)	The status can be checked in Md.31 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: X8, Axis 2: X9, Axis 3: XA, Axis 4: XB
Zero point return complete (XC, XD)	The status can be checked in Md.31 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 Cd.3 Positioning start No. and starting positioning start will execute zero point return.
M code OFF (Y1B, Y1C)	Cd.7 M code OFF request is used. Writing "1" turns M code OFF.

For details on the QD75 I/O signals, refer to Section 3.3 "Specifications of input/output signals with PLC CPU" of the Type QD75P/QD75D Positioning Module User's Manual.

7.2 Precautions for replacing AD71 with QD75

When programming, pay attention to the fact that the QD75 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	QD75	Points for replacement
Setup	Programmable controller ready	Y1D is turned ON with the sequence program.	Y0 is turned ON with the sequence program.	–
	Ready status confirmation	When AD71 is ready, X1 is turned ON.	When QD75 is ready, X0 is turned ON.	–
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.		–
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.3 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 QD75. Writing "9001" to Cd.3 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.3 "Positioning start No". in the buffer memory, and then turning ON the start signal (Y□) for each axis. Also, as the QD75 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.14 "New speed value" in the buffer memory and set "1" to Cd.15 JOG speed.	Setting "1" in Cd.15 "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.9 "New current value" in the buffer memory and "9003" to Cd.3 "Positioning start No." and then, turn ON the positioning start signal (Y□).	Writing "9003" to Cd.3 "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.6 "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.3 "Positioning start No." and turn ON the positioning start signal (Y□) to restart positioning.	Setting "1" to Cd.6 "Restart command" restarts positioning in the QD75.

Item	AD71	QD75	Points for replacement
Data backup method	Contents of the buffer memory are always backed up. The operation after power-on or programmable controller 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.1 Flash ROM write request. (The No. of flash ROM write: Up to 100000) At the time of power-on or programmable controller CPU reset, the flash ROM data are transferred to the buffer memory. (For details, refer to Section 7.3.) If the data has been written to the buffer memory with the ladder program at the time of power-on or programmable controller CPU reset, the data will be valid because the data transferred from the flash memory to the buffer memory is overwritten.	To back up data, "1" must be set in Cd.1 "Flash ROM write request". The max number of flash ROM writes is 100000 times.

7.3 Programming restrictions

(1) Reading/writing the data

We recommend setting the data explained in this chapter (various parameters, positioning data, block start data) by using GX Configurator-QP.
Setting with the sequence program requires so many sequence programs and devices that the program will be complicated, resulting in increasing the scan time.
Rewrite the positioning data four items before by the actual execution during continuous path control or continuous positioning control. If the positioning data is not rewritten by the execution of the positioning data four items before, the process will be carried out as if the data was not rewritten.

(2) Restrictions on speed change intervals

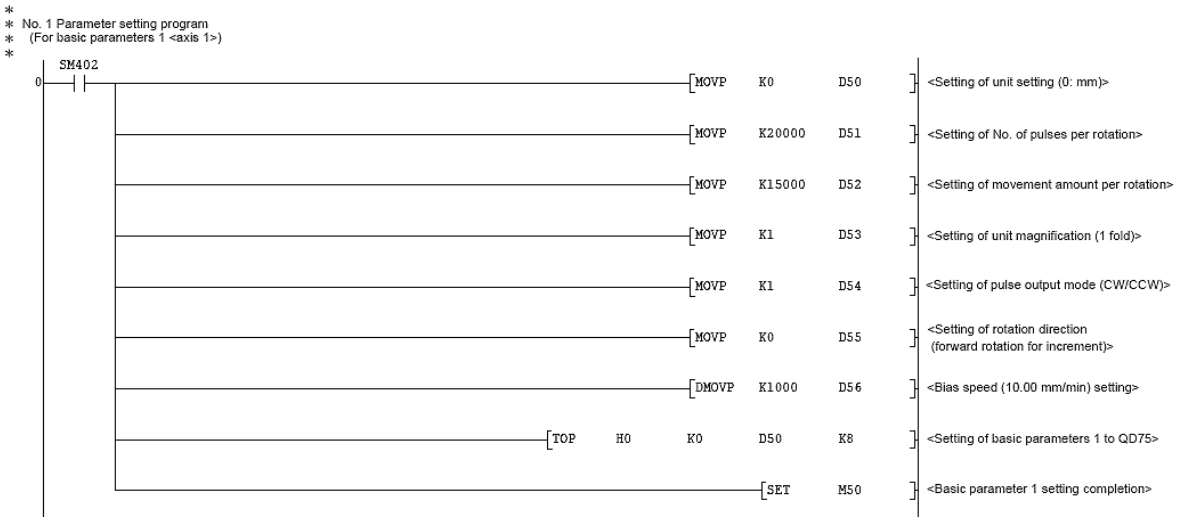
For the QD75, the speed change must be executed in intervals of 100ms or more.

7.4 Ladder program examples for QD75

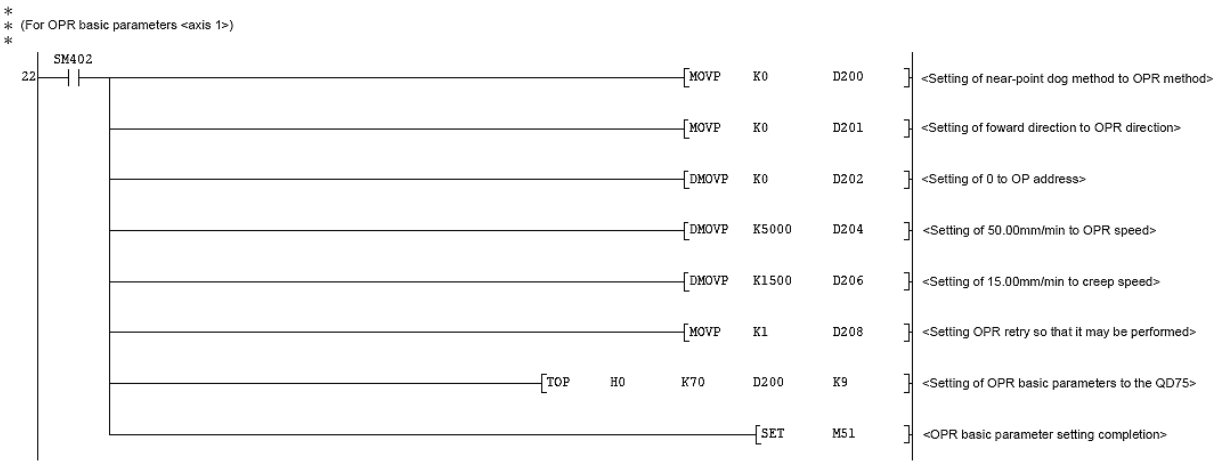
This section provides some basic program examples for the QD75 positioning control. When creating programs for the QD75, refer to the following examples and compare them with those in the AD71.
(The program examples represent the case in which the QD75 is mounted in slot 0 of the main base unit.)
For controls other than those shown as the examples, refer to the Type QD75P/QD75D Positioning Module User's Manual.
When using the peripheral software package (GX Cofigurator-QP) for the QD75 to create data, the following parameter setting program and the positioning data setting program are not required.

(1) Parameter data setting

(a) Basic parameters setting



(b) OPR basic parameters setting



(c) Speed-position switching control parameters setting (only when speed-position switching control function is used)

```
*
* Parameter setting program for speed-position switching control (ABS mode)
* <For axis 1>
*   (Not needed when speed-position switching control (ABS mode) is not executed)
* <X4D turns ON before startup>
*
   SM402    X4D
44 ─┤ ├──┤ ├──[TOP   H0   K0   K2   K1 ]  <Setting of unit setting (2: degree)>
             [DTOP  H0   K18  K0   K1 ]  <Software stroke limit upper limit = 0>
             [DTOP  H0   K20  K0   K1 ]  <Software stroke limit lower limit = 0>
             [TOP   H0   K30  K1   K1 ]  <Current feed value during speed control = 0>
             [TOP   H0   K34  K2   K1 ]  <Speed-position function selection (ABS mode)>
```

(2) Positioning data setting

(a) Positioning data setting

```
*
* No. 2 Positioning data setting program
*   (For positioning data No. 1 <axis 1>)
*   <Positioning identifier>
*       Operation pattern: Positioning complete
*       Control system: 1-axis linear control (ABS)
*       Acceleration time No.: 1, deceleration time No. 2
*
   SM402
73 ─┤ ├──[MOVP   H190   D58 ]  <Setting of positioning identifier>
          [MOVP   K9843  D59 ]  <Setting of M code (9843)>
          [MOVP   K300   D60 ]  <Setting of dwell time (300ms)>
          [MOVP   K0     D61 ]  <(Dummy data)>
          [DMOVP  K18000 D62 ]  <Setting of command speed (180.00mm/min)>
          [DMOVP  K4126  D64 ]  <Positioning address (412.6μm) setting>
          [DMOVP  K0     D66 ]  <Setting of arc address (0.0μm)>
          [TOP    H0     K2000  D58  K10 ]  <Setting of positioning data No. 1 to QD75>
```

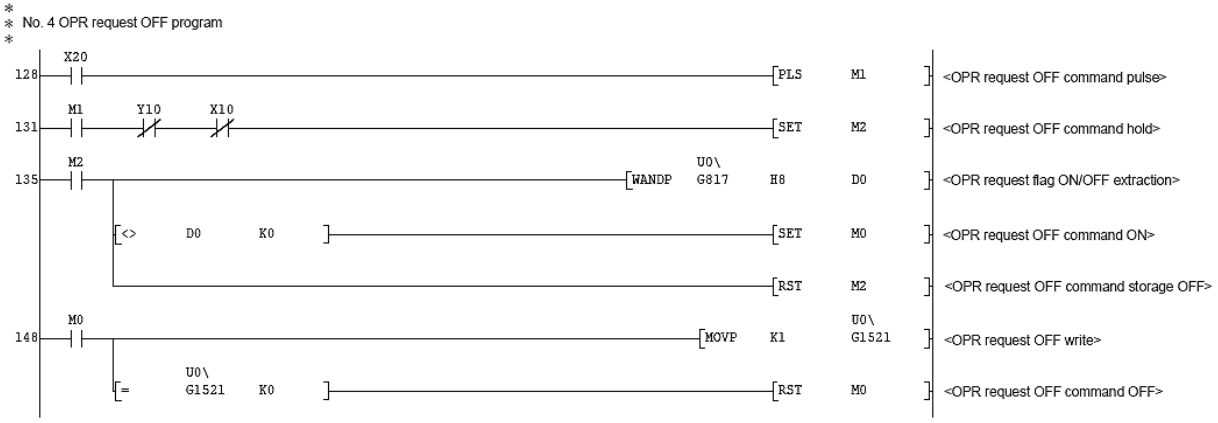
(b) Block start data setting (only when block start function is used)

```
*
*  No. 3 Block start data setting program
*   Block start data of start block 0 (axis 1)
*   For setting of points 1 to 5
*       (Conditions)
*         Shape: Continued at points 1 to 4, ended at point 5
*         Special start instruction: Normal start at all of points 1 to 5
*         <Positioning data are already preset>
*
*
*       [Setting of shape and start data No.]
*
   SM402
96 ─┤ ├──[MOVP   H8001   D68  ]  <Setting of continue and start data No. 1>
      ├──[MOVP   H8002   D69  ]  <Setting of continue and start data No. 2>
      ├──[MOVP   H8005   D70  ]  <Setting of continue and start data No. 5>
      ├──[MOVP   H800A   D71  ]  <Setting of continue and start data No. 10>
      ├──[MOVP   H0F     D72  ]  <Setting of end and start data No. 15>
      └──[TOP    H0   K26000  D68  K5 ]  <Setting of block start data to QD75>
```

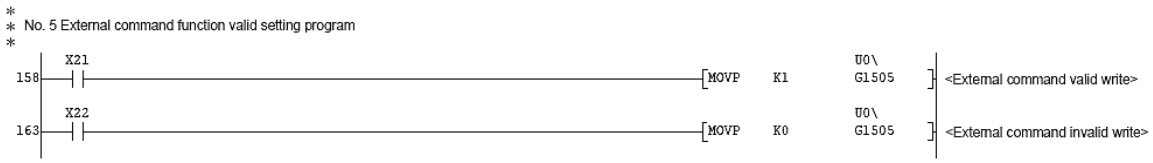
(c) Special start instruction data setting (only when special start instruction function is used)

```
*
* [Setting of special start instruction to normal start]
*
   SM402
112 ─┤ ├──[MOVP   H0   D73  ]  <Setting of normal start>
      ├──[MOVP   H0   D74  ]  <Setting of normal start>
      ├──[MOVP   H0   D75  ]  <Setting of normal start>
      ├──[MOVP   H0   D76  ]  <Setting of normal start>
      ├──[MOVP   H0   D77  ]  <Setting of normal start>
      └──[TOP    H0  K26050  D73  K5 ]  <Setting of block start data to QD75>
```

(d) OPR request OFF (only when OPR is not executed)



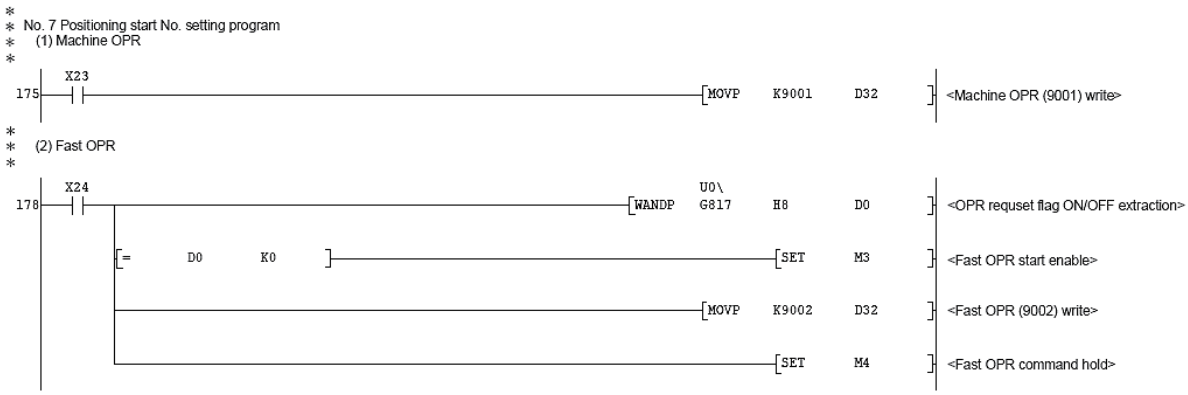
(e) External command function valid setting (only when external command function is executed)



(f) Programmable controller READY signal ON

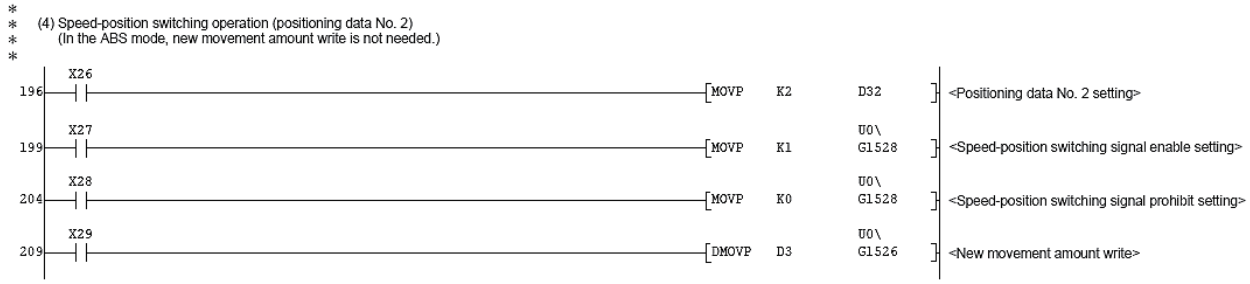
(3) Positioning start No. setting

(a) OPR

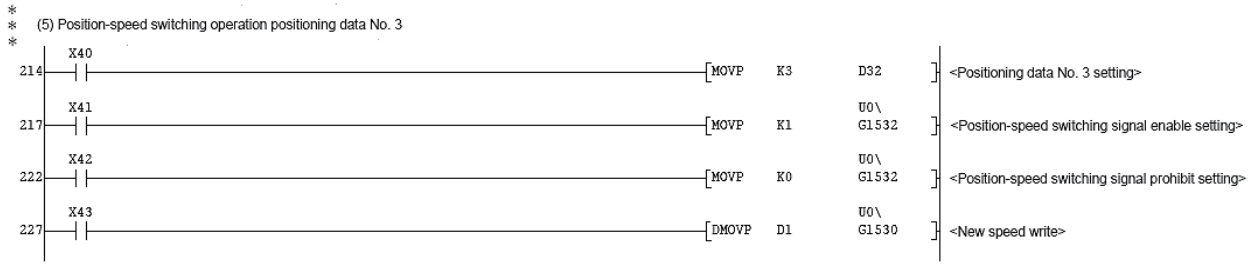


(b) Positioning start data No. setting

(c) Speed-position switching operation start data No. setting (only when speed-position switching operation function is used)

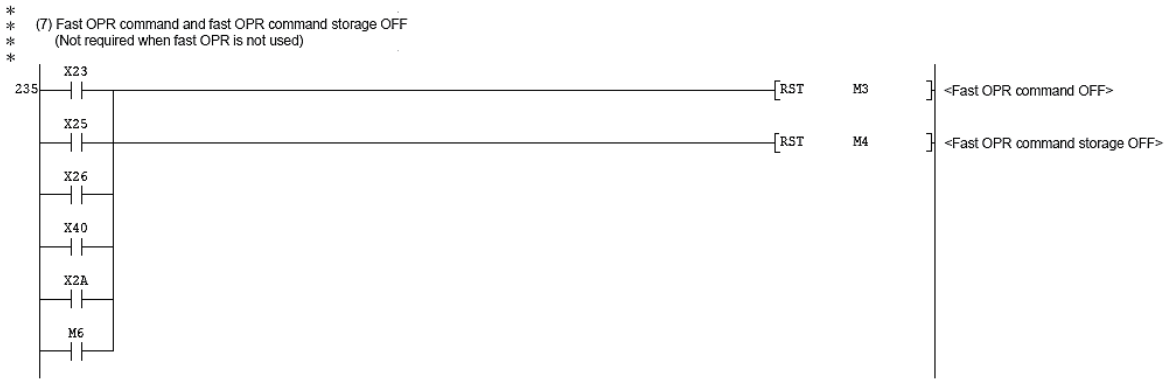


(d) Position-speed switching operation start data No. setting (QD75 additional function)



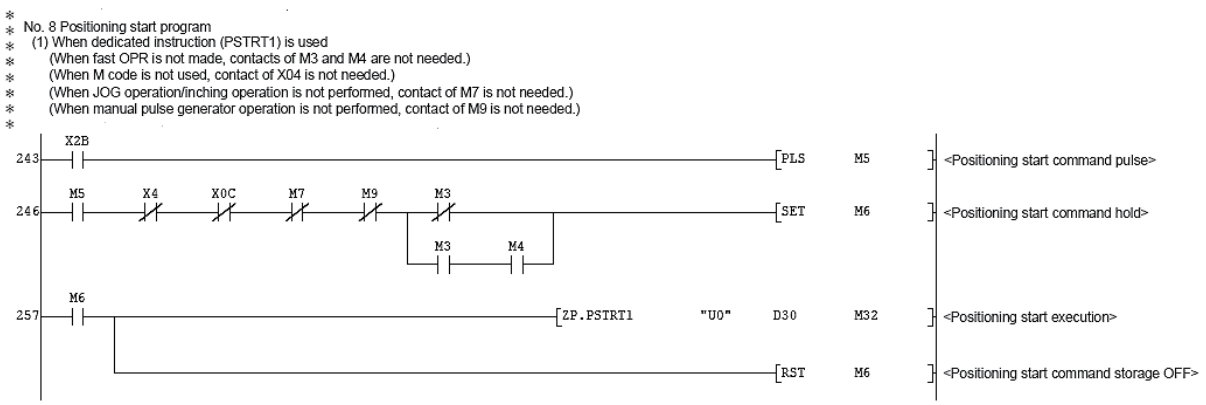
(e) High-level positioning control (only when block positioning start function is used)

(f) Fast OPR command OFF (only when fast OPR command function is used)

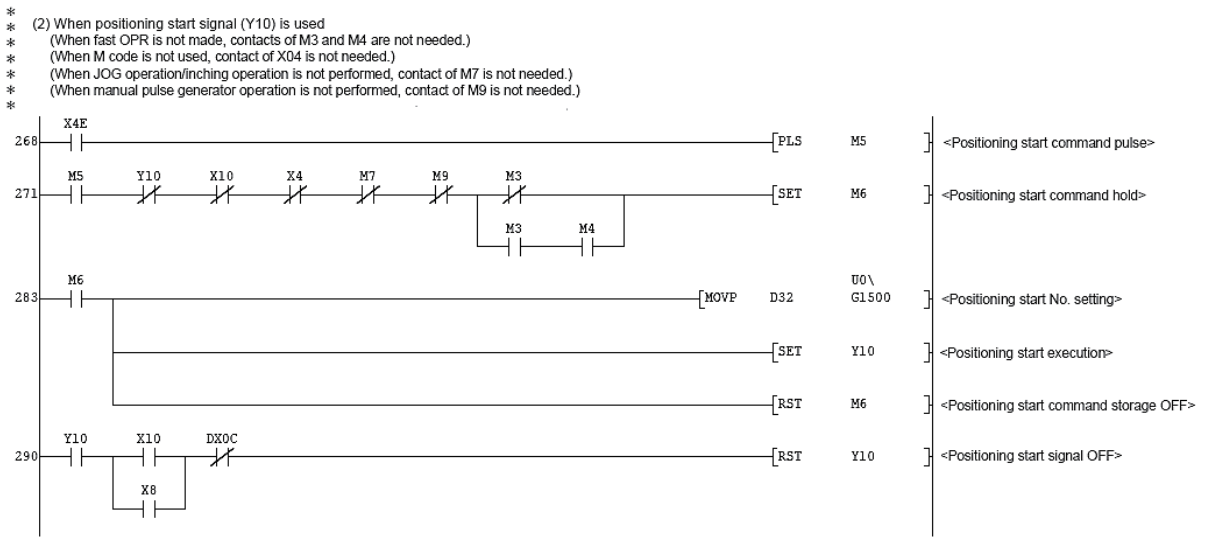


(4) Positioning start

(a) Start using dedicated instruction

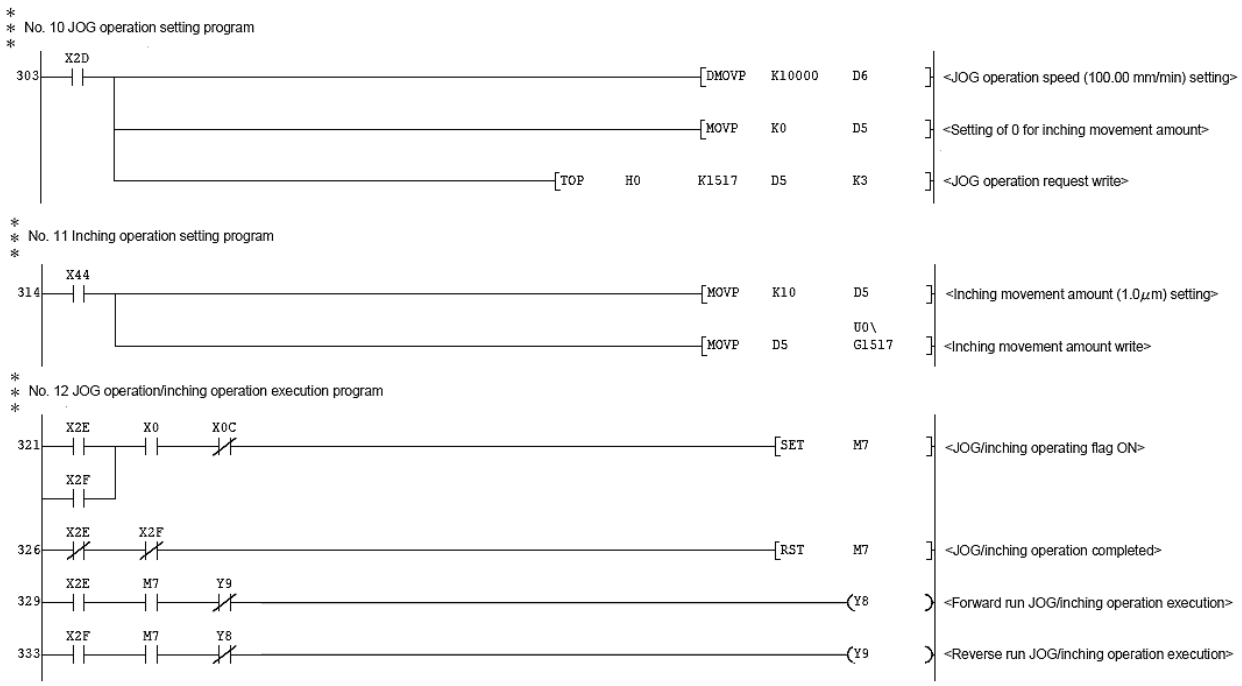


(b) Start using positioning start signal

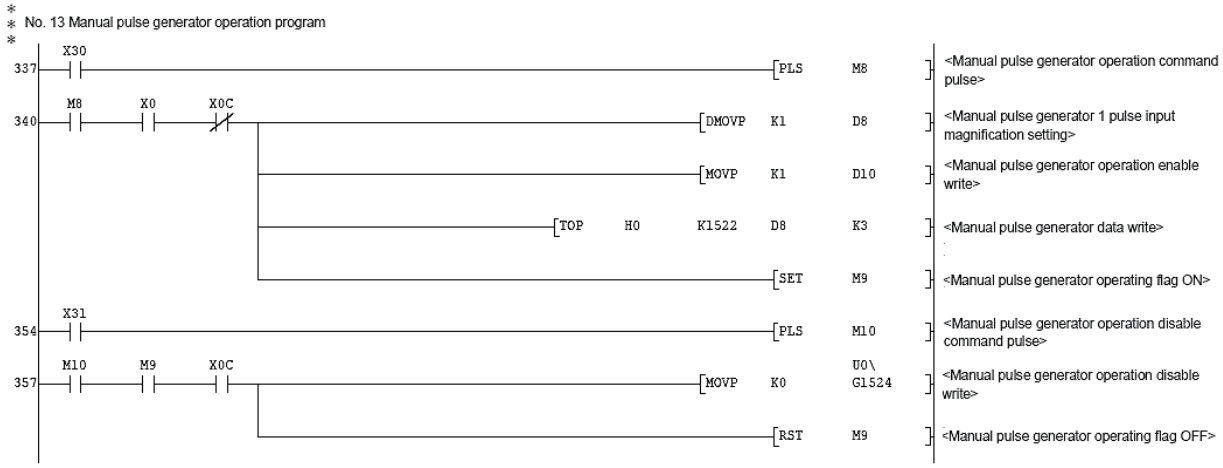


(c) M code OFF (only when M code is used)

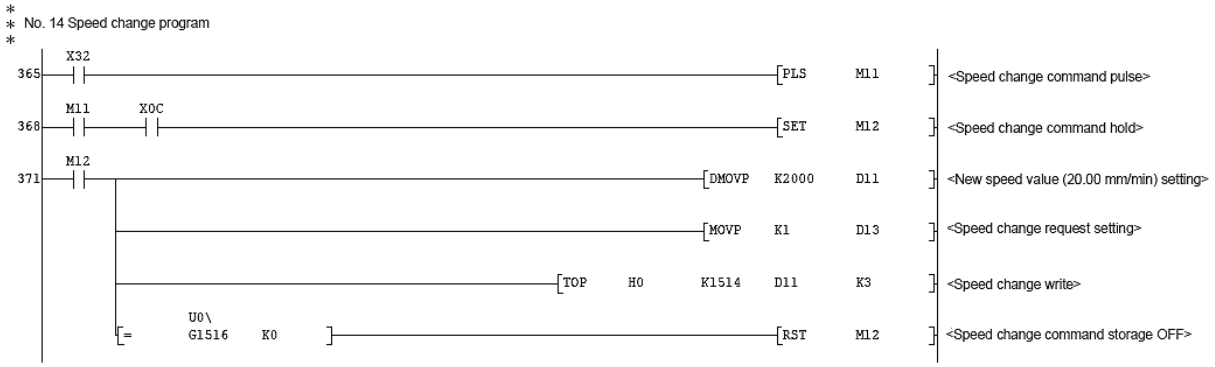
(d) JOG operation and inching operation (QD75 additional function) setting and start



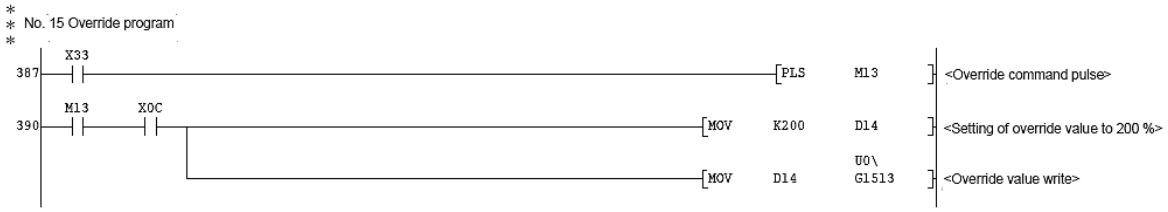
(e) Manual pulse generator operation (only when manual pulse is used)



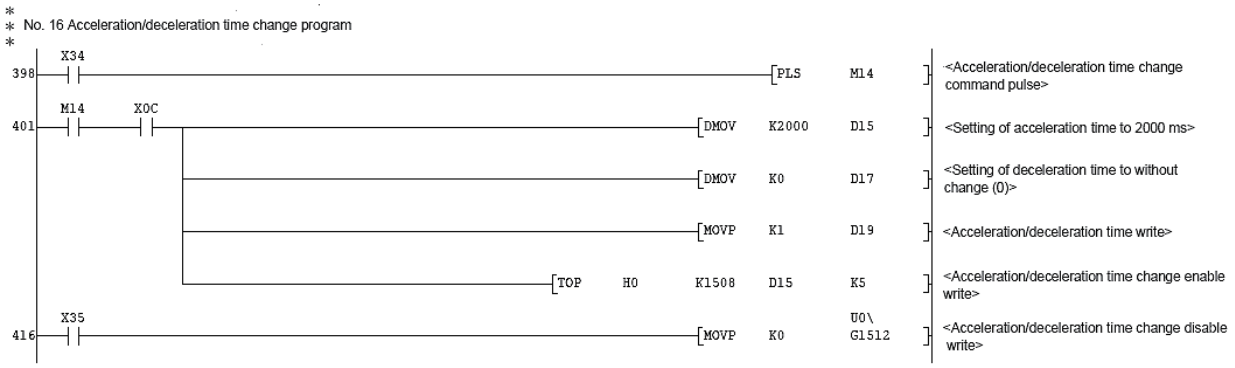
(f) Speed change using speed change values



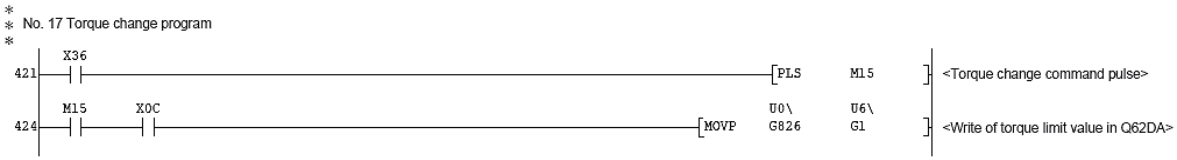
(g) Speed change using overwrite function (QD75 additional function)



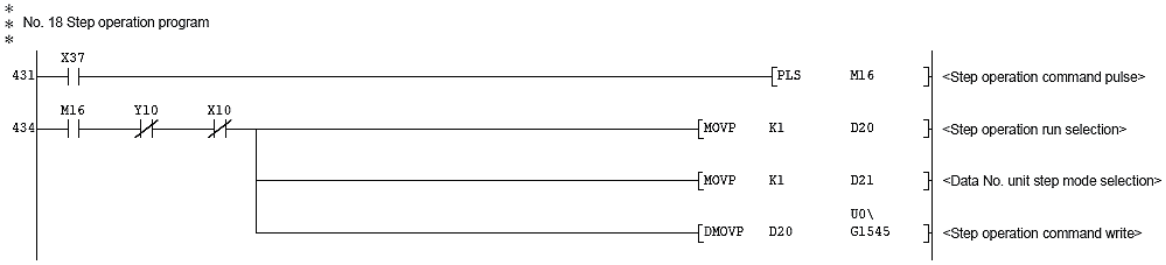
(h) Acceleration or deceleration time change (QD75 additional function)



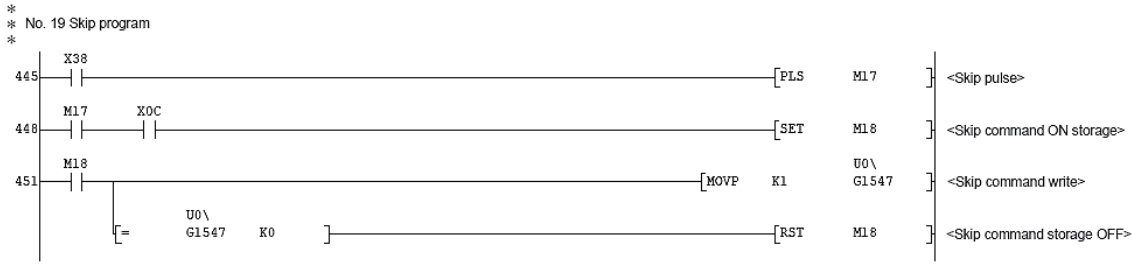
(i) Torque change (only when torque control function is used)



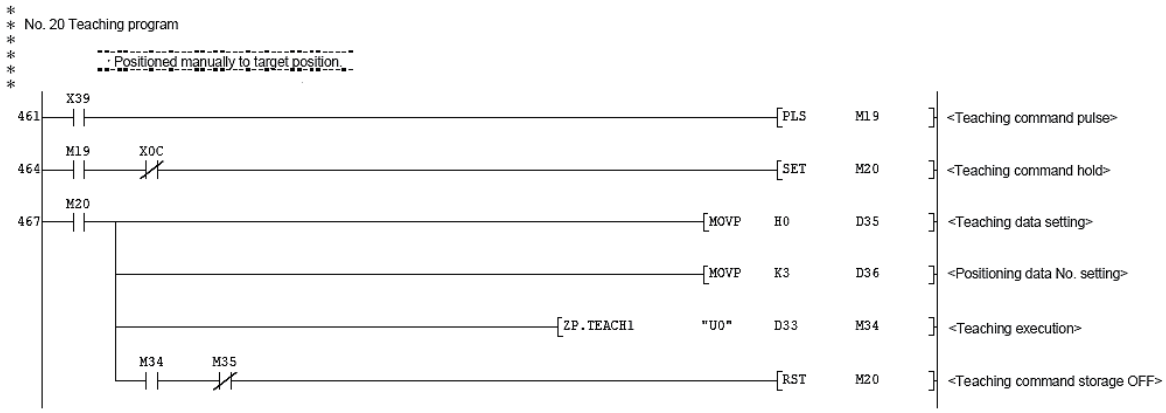
(j) Step operation (QD75 additional function)



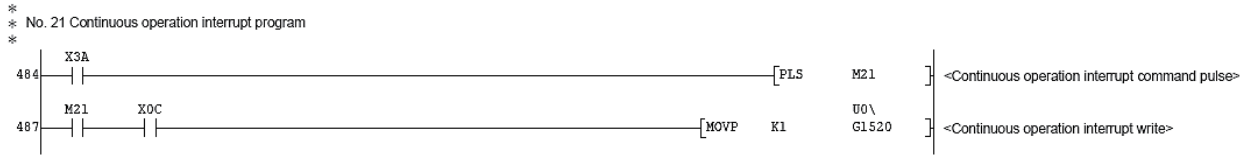
(k) Skip (QD75 additional function)



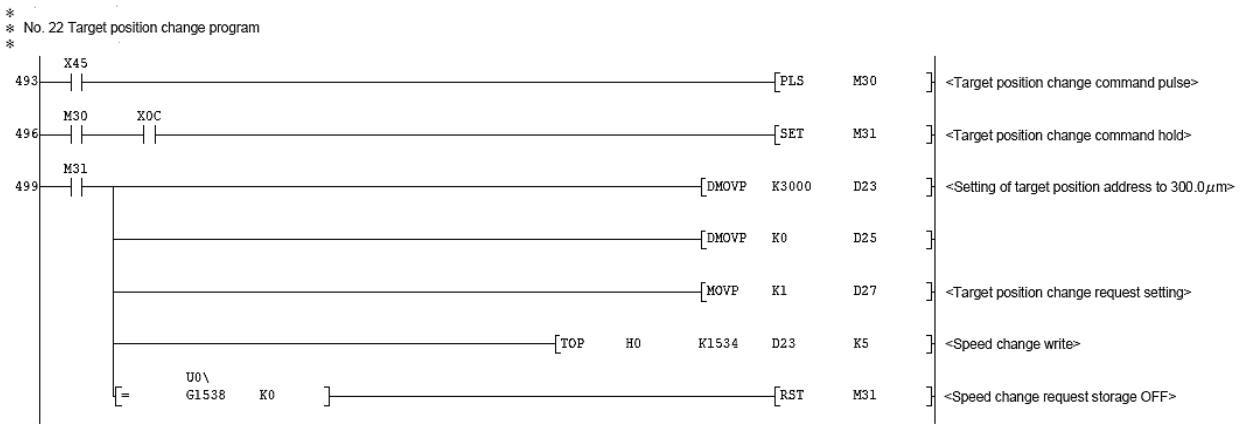
(l) Manual operation (teaching) positioning (QD75 additional function)



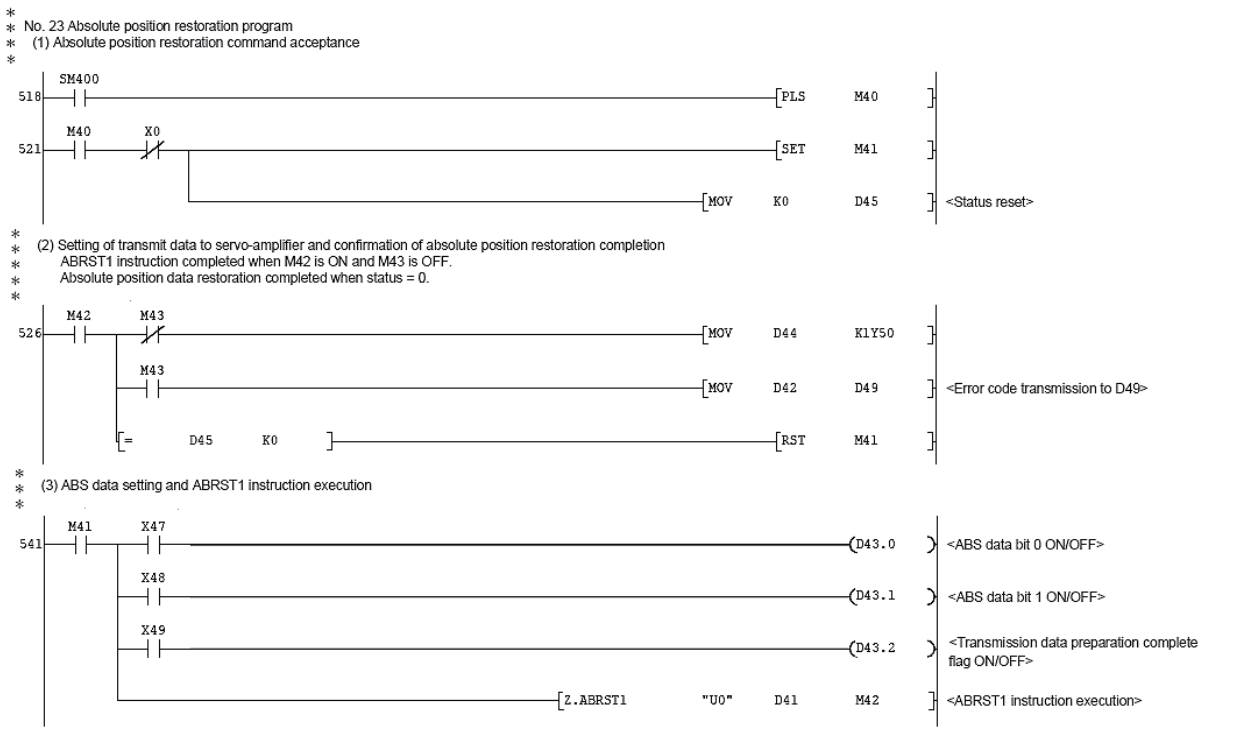
(m) Continuous operation interrupt



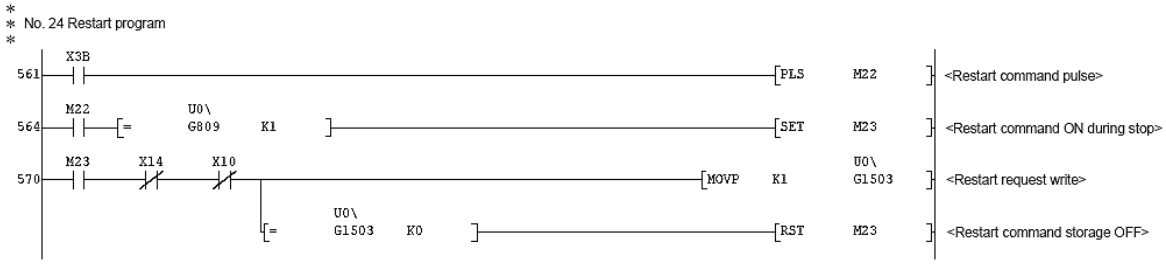
(n) Target position change (QD75 additional function)



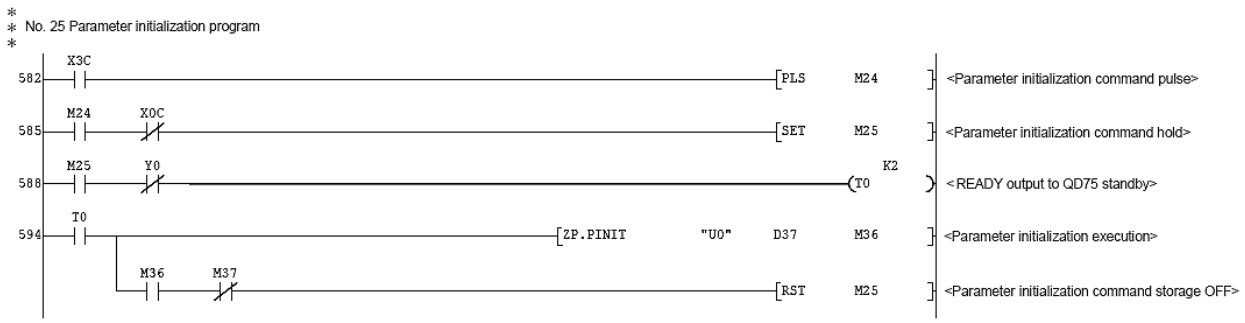
(o) Absolute position restoration (QD75 additional function)



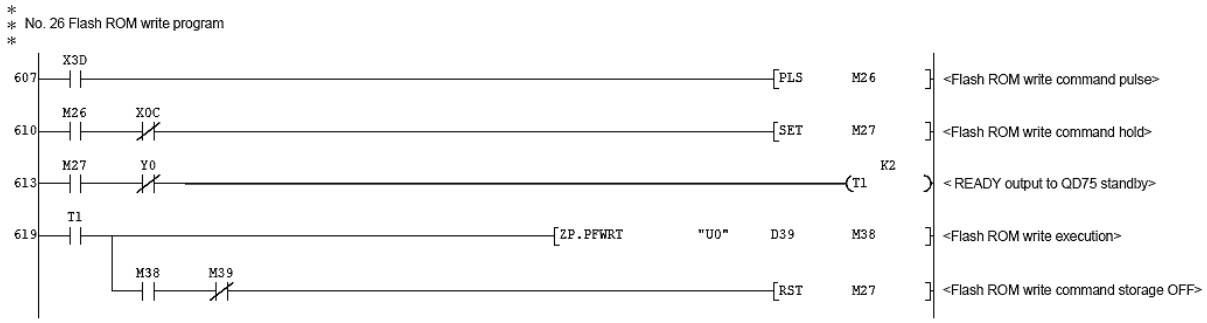
(p) Restart after positioning stop



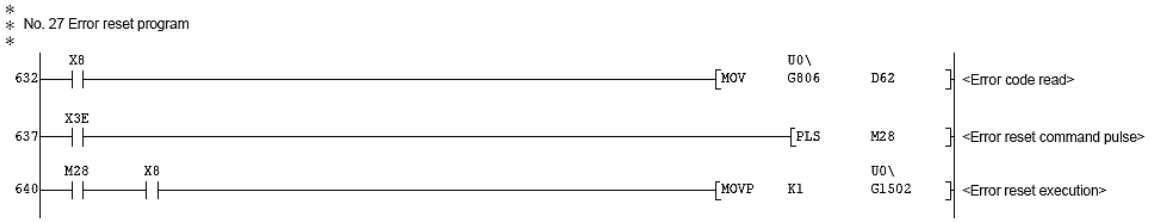
(q) Parameter initialization



(r) Flash ROM write



(s) Error reset



(t) Axis stop

8. QD75 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 QD75.

(1) 17-segment display check on QD75 module

Turn on the programmable controller and check the following LED display on the QD75 module when the program is in run.

(a) Turned on, off or blinked RUN indicator LED, ERR indicator LED, and Axis display LED indicate the module states. For further details, refer to Section 4.1.2 “Names of each part” of the Type QD75P/QD75D Positioning Module User's Manual.

(b) The data of the md.9 axis in which the error occurred and the md.10 axis error No. indicate an error and eliminate the factor.

(2) Check for “Ready ON” and “Servo ON”

After confirming the QD75 has started normally, turn on the programmable controller 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 QD75 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.

Appendix Tables of QD75 buffer memory addresses

The QD75 buffer memory addresses are listed below.
(Do not use any address other than listed below. If used, the system may not operate correctly.)

(1) Parameter Pr

Buffer memory address				Item	Memory area	
Axis 1	Axis 2	Axis 3	Axis 4			
0	150	300	450	Pr.1 Unit setting	Basic parameters 1	Positioning parameters
1	151	301	451	Pr.2 No. of pulses per rotation (Ap)		
2	152	302	452	Pr.3 Movement amount per rotation (Al)		
3	153	303	453	Pr.4 Unit magnification (Am)		
4	154	304	454	Pr.5 Pulse output mode		
5	155	305	455	Pr.6 Rotation direction setting		
6 7	156 157	306 307	456 457	Pr.7 Bias speed at start		
8 9	158 159	308 309	458 459	Not used	Basic parameters 2	
10 11	160 161	310 311	460 461	Pr.8 Speed limit value		
12 13	162 163	312 313	462 463	Pr.9 Acceleration time 0		
14 15	164 165	314 315	464 465	Pr.10 Deceleration time 0		
17	167	317	467	Pr.11 Backlash compensation amount	Detailed parameters 1	
18 19	168 169	318 319	468 469	Pr.12 Software stroke limit upper limit value		
20 21	170 171	320 321	470 471	Pr.13 Software stroke limit lower limit value		
22	172	322	472	Pr.14 Software stroke limit selection		
23	173	323	473	Pr.15 Software stroke limit valid/invalid selection		
24 25	174 175	324 325	474 475	Pr.16 Command in-position width		
26	176	326	476	Pr.17 Torque limit setting value		
27	177	327	477	Pr.18 M code ON signal output timing		
28	178	328	478	Pr.19 Speed switching mode		
29	179	329	479	Pr.20 Interpolation speed designation method		

Buffer memory address				Item	Memory area	
Axis 1	Axis 2	Axis 3	Axis 4			
30	180	330	480	Pr.21 Current feed value during speed control	Detailed parameters 1	Positioning parameters
31	181	331	481	Pr.22 Input signal logic selection		
32	182	332	482	Pr.23 Output signal logic selection		
33	—	—	—	Pr.24 Manual pulse generator input selection		
34	184	334	484	Pr.150 Speed-position function selection		
35	185	335	485	Not used	Detailed parameters 2	
36 37	186 187	336 337	486 487	Pr.25 Acceleration time 1		
38 39	188 189	338 339	488 489	Pr.26 Acceleration time 2		
40 41	190 191	340 341	490 491	Pr.27 Acceleration time 3		
42 43	192 193	342 343	492 493	Pr.28 Deceleration time 1		
44 45	194 195	344 345	494 495	Pr.29 Deceleration time 2		
46 47	196 197	346 347	496 497	Pr.30 Deceleration time 3		
48 49	198 199	348 349	498 499	Pr.31 JOG speed limit value		
50	200	350	500	Pr.32 JOG operation acceleration time selection		
51	201	351	501	Pr.33 JOG operation deceleration time selection		
52	202	352	502	Pr.34 Acceleration/deceleration process selection		
53	203	353	503	Pr.35 S-curve ratio		
54 55	204 205	354 355	504 505	Pr.36 Sudden stop deceleration time		
56	206	356	506	Pr.37 Stop group 1 sudden stop selection		
57	207	357	507	Pr.38 Stop group 2 sudden stop selection		
58	208	358	508	Pr.39 Stop group 3 sudden stop selection		
59	209	359	509	Pr.40 Positioning complete signal output time		
60 61	210 211	360 361	510 511	Pr.41 Allowable circular interpolation error width		
62	212	362	512	Pr.42 External command function selection		

Buffer memory address				Item	Memory area	
Axis 1	Axis 2	Axis 3	Axis 4			
70	220	370	520	Pr.43 OPR method	OPR basic parameters	OPR parameters
71	221	371	521	Pr.44 OPR direction		
72 73	222 223	372 373	522 523	Pr.45 OP address		
74 75	224 225	374 375	524 525	Pr.46 OPR speed		
76 77	226 227	376 377	526 527	Pr.47 Creep speed		
78	228	378	528	Pr.48 OPR retry		
79	229	379	529	Pr.49 OPR dwell time	OPR detailed parameters	
80 81	230 231	380 381	530 531	Pr.50 Setting for the movement amount after near-point dog ON		
82	232	382	532	Pr.51 OPR acceleration time selection		
83	233	383	533	Pr.52 OPR deceleration time selection		
84 85	234 235	384 385	534 535	Pr.53 OP shift amount		
86	236	386	536	Pr.54 OPR torque limit value		
87	237	387	537	Pr.55 Deviation counter clear signal output time		
88	238	388	538	Pr.56 Speed designation during OP shift		
89	239	389	539	Pr.57 Dwell time during OPR retry		

(2) Monitor data Md

Buffer memory address Axis 1	Axis 2	Axis 3	Axis 4	Item		Memory area	
1200				Md.1 In test mode flag		System monitor data	Monitor data
1201 to 1211				Not used			
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(Pointer No.)	Start History		
1212	1217	1222	1227	1232	1237	1242	1247	1252	1257	1262	1267	1272	1277	1282	1287	Md.3 Start information			
1213	1218	1223	1228	1233	1238	1243	1248	1256	1258	1263	1268	1273	1278	1283	1288	Md.4 Start No.			
1214	1219	1224	1229	1234	1239	1244	1249	1254	1259	1264	1269	1274	1279	1284	1289	Md.5 Start (Hour)			
1215	1220	1225	1230	1235	1240	1245	1250	1255	1260	1265	1270	1275	1280	1285	1290	Md.6 Start (Minute: second)			
1216	1221	1226	1231	1236	1241	1246	1251	1256	1261	1266	1271	1276	1281	1286	1291	Md.7 Error judgment			
1292																Md.8 Start history pointer			
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(Pointer No.)	Error History		
1293	1297	1301	1305	1309	1313	1317	1321	1325	1329	1333	1337	1341	1345	1349	1353	Md.9 Axis in which the error occurred			
1294	1298	1302	1306	1310	1314	1318	1322	1326	1330	1334	1338	1342	1346	1350	1354	Md.10 Axis error No.			
1295	1299	1303	1307	1311	1315	1319	1323	1327	1331	1335	1339	1343	1347	1351	1355	Md.11 Axis error occurrence (Hour)			
1296	1300	1304	1308	1312	1316	1320	1324	1328	1332	1336	1340	1344	1348	1352	1356	Md.12 Axis error occurrence (Minute: second)			
1357																Md.13 Error history pointer			
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(Pointer No.)	Warning history		
1358	1362	1366	1370	1374	1378	1382	1386	1390	1394	1398	1402	1406	1410	1414	1418	Md.14 Axis in which the warning occurred			
1359	1363	1367	1371	1375	1379	1383	1387	1391	1395	1399	1403	1407	1411	1415	1419	Md.15 Axis warning No.			
1360	1364	1368	1372	1376	1380	1384	1388	1392	1396	1400	1404	1408	1412	1416	1420	Md.16 Axis warning occurrence (Hour)			
1361	1365	1369	1373	1377	1381	1385	1389	1393	1397	1401	1405	1409	1413	1417	1421	Md.17 Axis warning occurrence (Minute: second)			
1422																Md.18 Warning history pointer			
1424 1425																Md.19 No. of write accesses to flash ROM			

Buffer memory address				Item	Memory area	
Axis 1	Axis 2	Axis 3	Axis 4			
800 801	900 901	1000 1001	1100 1101	Md.20 Current feed value	Axis monitor data	Monitor data
802 803	902 903	1002 1003	1102 1103	Md.21 Machine feed value		
804 805	904 905	1004 1005	1104 1105	Md.22 Feedrate		
806	906	1006	1106	Md.23 Axis error No.		
807	907	1007	1107	Md.24 Axis warning No.		
808	908	1008	1108	Md.25 Valid M code		
809	909	1009	1109	Md.26 Axis operation status		
810 811	910 911	1010 1011	1110 1111	Md.27 Current speed		
812 813	912 913	1012 1013	1112 1113	Md.28 Axis feedrate		
814 815	914 915	1014 1015	1114 1115	Md.29 Speed-position switching control positioning amount		
816	916	1016	1116	Md.30 External input/output signal		
817	917	1017	1117	Md.31 Status		
818 819	918 919	1018 1019	1118 1119	Md.32 Target value		
820 821	920 921	1020 1021	1120 1121	Md.33 Target speed		
824 825	924 925	1024 1025	1124 1125	Md.34 Movement amount after near-point dog ON		
826	926	1026	1126	Md.35 Torque limit stored value		
827	927	1027	1127	Md.36 Special start data instruction parameter setting value		
828	928	1028	1128	Md.37 Special start data instruction No. setting value		
829	929	1029	1129	Md.38 Start positioning data No. setting value.		
830	930	1030	1130	Md.39 In speed control flag		
831	931	1031	1131	Md.40 In speed change processing flag		
832	932	1032	1132	Md.41 Special start repetition counter		
833	933	1033	1133	Md.42 Control system repetition counter		

Buffer memory address				Item	Memory area	
Axis 1	Axis 2	Axis 3	Axis 4			
834	934	1034	1134	Md.43 Start data pointer being executed	Axis monitor data	Monitor data
835	935	1035	1135	Md.44 Positioning data No. being executed		
836	936	1036	1136	Md.45 Block No. being executed		
837	937	1037	1137	Md.46 Last executed positioning data No.		
838 to 847	938 to 947	1038 to 1047	1138 to 1147	Md.47 Positioning data being executed		
899	999	1099	1199	Md.48 Deceleration start flag		

(3) Control data Cd

Buffer memory address				Item	Memory area	
Axis 1	Axis 2	Axis 3	Axis 4			
1500	1600	1700	1800	Cd.3 Positioning start No.	Axis control data	Control data
1501	1601	1701	1801	Cd.4 Positioning starting point No.		
1502	1602	1702	1802	Cd.5 Axis error reset		
1503	1603	1703	1803	Cd.6 Restart command		
1504	1604	1704	1804	Cd.7 M code OFF request		
1505	1605	1705	1805	Cd.8 External command valid		
1506 1507	1606 1607	1706 1707	1806 1807	Cd.9 New current value		
1508 1509	1608 1609	1708 1709	1808 1809	Cd.10 New acceleration time value		
1510 1511	1610 1611	1710 1711	1810 1811	Cd.11 New deceleration time value		
1512	1612	1712	1812	Cd.12 Acceleration/deceleration time change during speed change, enable/disable selection		
1513	1613	1713	1813	Cd.13 Positioning operation speed override		
1514 1515	1614 1615	1714 1715	1814 1815	Cd.14 New speed value		
1516	1616	1716	1816	Cd.15 Speed change request		
1517	1617	1717	1817	Cd.16 Inching movement amount		
1518 1519	1618 1619	1718 1719	1818 1819	Cd.17 JOG speed		
1520	1620	1720	1820	Cd.18 Interrupt request during continuous operation		
1521	1621	1721	1821	Cd.19 OPR request flag OFF request		
1522 1523	1622 1623	1722 1723	1822 1823	Cd.20 Manual pulse generator 1 pulse input magnification		
1524	1624	1724	1824	Cd.21 Manual pulse generator enable flag		
1525	1625	1725	1825	Cd.22 New torque value		
1526 1527	1626 1627	1726 1727	1826 1927	Cd.23 Speed-position switching control movement amount change register		
1528	1628	1728	1828	Cd.24 Speed-position switching enable flag		
1529	1629	1729	1829	Not used		

Buffer memory address				Item	Memory area	
Axis 1	Axis 2	Axis 3	Axis 4			
1530 1531	1630 1631	1730 1731	1830 1831	Cd.25 Position-speed switching control speed change register	Axis control data	Control data
1532	1632	1732	1832	Cd.26 Position-speed switching enable flag		
1533	1633	1733	1833	Not used		
1534 1535	1634 1635	1734 1735	1834 1835	Cd.27 Target position change value (new address)		
1536 1537	1636 1637	1736 1737	1836 1837	Cd.28 Target position change value (new speed)		
1538	1638	1738	1838	Cd.29 Target position change request flag		
1539	1639	1739	1839	Not used		
1540	1640	1740	1840	Cd.30 Simultaneous starting axis start data No. (axis 1 start data No.)		
1541	1641	1741	1841	Cd.31 Simultaneous starting axis start data No. (axis 2 start data No.)		
1542	1642	1742	1842	Cd.32 Simultaneous starting axis start data No. (axis 3 start data No.)		
1543	1643	1743	1843	Cd.33 Simultaneous starting axis start data No. (axis 4 start data No.)		
1544	1644	1744	1844	Cd.34 Step mode		
1545	1645	1745	1845	Cd.35 Step valid flag		
1546	1646	1746	1846	Cd.36 Step start information		
1547	1647	1747	1847	Cd.37 Skip command		
1548	1648	1748	1848	Cd.38 Teaching data selection		
1549	1649	1749	1849	Cd.39 Teaching positioning data No.		
1550	1650	1750	1850	Cd.40 ABS direction in degrees		
1900				Cd.1 Flash ROM write request	System Control data	
1901				Cd.2 Parameter initialization request		
1905				Cd.41 Deceleration start flag valid		
1907				Cd.42 Stop command processing for deceleration stop selection		

(4) Positioning data Da

Buffer memory address				Item		Memory area	
Axis 1	Axis 2	Axis 3	Axis 4				
2000	8000	14000	20000	Da.1 Operation pattern Da.2 Control system Da.3 Acceleration time No. Da.4 Deceleration time No. Da.5 Axis to be interpolated	No.1	Positioning data	Positioning data
2001	8001	14001	20001	Da.10 M code/condition data No. /No. of LOOP to LEND repetitions			
2002	8002	14002	20002	Da.9 Dwell time/JUMP destination positioning data No.			
2003	8003	14003	20003	Not used			
2004 2005	8004 8005	14004 14005	20004 20005	Da.8 Command speed			
2006 2007	8006 8007	14006 14007	20006 20007	Da.6 Positioning address/movement amount			
2008 2009	8008 8009	14008 14009	20008 20009	Da.7 Arc address			
2010 to 2019	8010 to 8019	14010 to 14019	20010 to 20019	No.2			
2020 to 2029	8020 to 8029	14020 to 14029	20020 to 20020	No.3			
to	to	to	to	to			
7990 to 7999	13990 to 13999	19990 to 19999	25990 to 25999	No.600			

<table>
<tr><th colspan="8">Buffer memory address</th><th rowspan="2">Item</th><th colspan="4">Memory area</th></tr>
<tr><th colspan="2">Axis 1</th><th colspan="2">Axis 2</th><th colspan="2">Axis 3</th><th colspan="2">Axis 4</th><th colspan="2"></th><th></th><th></th></tr>
<tr><td>26000</td><td>26050</td><td>27000</td><td>27050</td><td>28000</td><td>28050</td><td>29000</td><td>29050</td><td>Da.11 Shape
Da.12 Start data No.
Da.13 Specilal start instruction
Da.14 Parameter</td><td>1st point</td><td rowspan="5">Block start data</td><td rowspan="15">Starting block 0</td><td rowspan="17">Positioning data (Starting block data)</td></tr>
<tr><td>26001</td><td>26051</td><td>27001</td><td>27051</td><td>28001</td><td>28051</td><td>29001</td><td>29051</td><td colspan="2">2nd point</td></tr>
<tr><td>26002</td><td>26052</td><td>27002</td><td>27052</td><td>28002</td><td>28052</td><td>29002</td><td>29052</td><td colspan="2">3rd point</td></tr>
<tr><td colspan="2">to</td><td colspan="2">to</td><td colspan="2">to</td><td colspan="2">to</td><td colspan="2">to</td></tr>
<tr><td>26049</td><td>26099</td><td>27049</td><td>27099</td><td>28049</td><td>28099</td><td>29049</td><td>29099</td><td colspan="2">50th point</td></tr>
<tr><td colspan="2">26100</td><td colspan="2">27100</td><td colspan="2">28100</td><td colspan="2">29100</td><td>Da.15 Condition target
Da.16 Condition operator</td><td rowspan="4">No. 1</td><td rowspan="11">Condition data</td></tr>
<tr><td colspan="2">26102
26103</td><td colspan="2">27102
27103</td><td colspan="2">28102
28103</td><td colspan="2">29102
29103</td><td>Da.17 Address</td></tr>
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to
30099</td><td>Condition judgement target data of the condition data</td><td>Programmable controller CPU memory area</td><td>Positioning data</td></tr>
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REVISIONS

Version	Print Date	Revision
-	April 2009	First edition
A	May 2010	(3) in Section 2.2 “Servo amplifier connection example” was reviewed.